BLM

United States Department of the Interior
Bureau of Land Management

SODA MOUNTAIN SOLAR PROJECT

DRAFT PLAN AMENDMENT/ ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT

Volume 1 of 2

November 2013

CACA #049584

Publication Index #: *BLM/CA/PL-2014/002+1793*

United States Department of the Interior

Bureau of Land Management

Draft Plan Amendment / Environmental Impact Statement / Environmental Impact Report for the Soda Mountain Solar Project

For the

Barstow Field Office

Barstow, California

November 2013

Publication Index #: BLM/CA/PL-2014/002+1793

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Barstow Field Office
2601 Barstow Road
Barstow, CA 92311

Phone (760) 252-6000 | Fax (760) 252-6098
http://www.blm.gov/ca/st/en/fo/barstow.html

In reply refer to:
CACA 049584
LLCAD0800

Dear Reader:

I am pleased to announce the availability of the Draft Plan Amendment (PA) to the California Desert Conservation Area Plan, 1980, as amended (CDCA Plan), and Draft Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) for the Soda Mountain Solar Project (Project). Soda Mountain Solar, LLC (Applicant) is proposing to develop a 358-megawatt (MW) solar energy plant in San Bernardino County, California. The Bureau of Land Management (BLM) is the Lead Agency for the PA and EIS, and San Bernardino County, California, is the Lead Agency for the EIR.

The enclosed Draft PA/EIS/EIR analyzes seven alternatives, including: (1) the BLM's amendment of the CDCA Plan and grant to the Applicant of right-of-way (ROW) authorization for a 358 MW solar energy plant and related facilities within an approximately 4,179-acre area of BLM-administered public land in San Bernardino County, California, and the County's approval of the requested groundwater well permit (Alternative A); (2) the BLM's amendment of the CDCA Plan and grant of ROW authorization to develop 264 MW on approximately 1,647 acres of public land within the proposed East and South Arrays, and County permit approval (Alternative B); (3) the BLM's amendment of the CDCA Plan and grant of ROW authorization to develop 298 MW on approximately 1,823 acres of public land within the proposed North and South Arrays, and County permit approval (Alternative C); (4) the BLM's amendment of the CDCA Plan and grant of ROW authorization to develop 250 MW on approximately 1,717 acres of public land in a configuration that would maintain Rasor Road in its existing location as an Open Route for off-highway vehicle use, and County permit approval (Alternative D); (5) the BLM taking No Action on the proposed CDCA Amendment and denial of the requested ROW grant, and denial of the County permit (Alternative E); and (6) the BLM's amendment of the CDCA Plan and grant of ROW authorization to develop any of the action alternatives, County denial of the requested groundwater well permit (Alternative F); and (7) no issuance of a ROW Grant, no County permit approval, and a CDCA Plan Amendment identifying the requested ROW area as unsuitable for solar development (Alternative G).

The Draft PA/EIS/EIR has been prepared in accordance with the Federal Land Policy and Management Act (FLPMA), National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The FLPMA establishes the land management authority of the BLM and provides guidance for how to manage the public lands under its jurisdiction, and the National Environmental Policy Act (NEPA) requires federal agencies to take a hard look at the potential environmental consequences of their decisions. In addition, because San Bernardino

County has discretionary authority to issue a groundwater well permit for the Project, an EIR is required for compliance with CEQA. The County intends to rely on this Draft PA/EIS/EIR in accordance with CEQA to document the analysis of potential environmental impacts resulting from its approval of a permit for the Project. The document has been sent to members of the public who requested a copy and to pertinent local, state, tribal, and federal government entities.

The Draft PA/EIS/EIR will be circulated for a 90-day public comment period. All comments must be postmarked no later than 90 days from the date the Notice of Availability for the Draft PA/EIS/EIR is published in the Federal Register by the U.S. Environmental Protection Agency. Comments may be sent to Jeff Childers, Project Manager, by mail: 22835 Calle San Juan De Los Lagos, Moreno Valley, CA, 92553; phone: (951) 697-5308; or email: sodamtnsolar@blm.gov. Public meetings will be held in Barstow, California, to provide clarification of the Project design and alternatives, describe the impacts and mitigation measures, and accept written public comments. Please see the BLM's web page at http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html for information about the location, date, and time of these meetings. All substantive issues raised during the comment period will be considered and responded to, and modifications based on these comments may be made in the Proposed PA/Final EIS/EIR.

Additional hard copies or CD-ROM versions of the Draft PA/EIS/EIR may be obtained by contacting the Barstow Field Office. The document also will be available on the Internet at: http://www.blm.gov/ca/st/ en/fo/barstow/renewableenergy/soda_mountain.html.

We are pleased to provide this copy of the Draft PA/EIS/EIR for your review and extend our appreciation for your cooperation and assistance during this process. We look forward to your continued participation.

Sincerely,

Katrina Symons
Field Manager

California Desert District

Soda Mountain Solar Project

Plan Amendment/Environmental Impact Statement/Environmental Impact Report

Lead Agency for NEPA: Bureau of Land Management (BLM)
California Desert District (CDD), Moreno Valley, California

Lead Agency for CEQA: San Bernardino County

For further information, contact:
Jeff Childers, Project Manager
BLM California Desert District
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

Abstract

This Draft Plan Amendment/Environmental Impact Statement/Environmental Impact Report (PA/EIS/EIR) addresses a possible United States Bureau of Land Management (BLM) amendment to the *California Desert Conservation Area Plan of 1980, as amended* (CDCA Plan); a possible decision to issue a right-of-way (ROW) grant for construction, operation, maintenance, and decommissioning of a solar electricity generation facility on BLM-administered public land; and a possible County approval of a groundwater well permit.

The enclosed Draft PA/EIS/EIR analyzes seven alternatives, including: (1) an amendment of the CDCA Plan and grant of a ROW authorization for a 358-megawatt (MW) solar energy plant and related facilities within an approximately 4,179-acre area of BLM-administered public land in San Bernardino County, California, and the County's approval of the requested groundwater well permit (Alternative A); (2) an amendment of the CDCA Plan and grant of a ROW authorization to develop 264 MW on approximately 1,647 acres of public land within the proposed east and south arrays, and County groundwater well permit approval (Alternative B); (3) an amendment of the CDCA Plan and grant of a ROW authorization to develop 298 MW on approximately 1,823 acres of public land within the proposed north and south arrays, and County groundwater well permit approval (Alternative C); (4) an amendment of the CDCA Plan and grant of a ROW authorization to develop 250 MW on approximately 1,717 acres of public land in a configuration that would maintain Rasor Road in its existing location as an Open Route for off-highway vehicle use, and County groundwater well permit approval (Alternative D); (5) a CDCA Plan amendment would not be processed and the requested ROW grant would be denied, and the County would deny the groundwater well permit (Alternative E); (6) an amendment of the CDCA Plan and grant of a ROW to develop any of the action alternatives, and County denial of the requested groundwater well permit (Alternative F); and (7) no issuance of a ROW Grant, no County permit approval, and a CDCA Plan Amendment identifying the requested ROW area as unsuitable for solar development (Alternative G).

Chapter 2 discusses the proposed Soda Mountain Solar Project and the alternatives described above. Chapter 3 describes the existing conditions on and in the vicinity of the project area and the potential environmental impacts expected under each of the alternatives.

The Field Manager of the Barstow Field Office has the authority for site management of future activities related to the ROW grant and is the BLM Authorized Officer for the NEPA and CDCA Plan Amendment portions of this PA/EIS/EIR.

TABLE OF CONTENTS

Soda Mountain Solar Project
Draft PA/EIS/EIR

Volume 1

Cover Sheet

Dear Reader Letter

Abstract

		Page
	Executive Summary	
	ES.1 Background and Project Overview	ES-1
	ES.2 Purpose and Need	ES-2
	ES.3 Proposed Action and Alternatives	ES-3
	ES.4 Cumulative Scenario	ES-5
	ES.5 Environmental Consequences	ES-5
1.	**Introduction and Purpose and Need**	**1-1**
	1.1 Introduction	1-1
	1.2 Purpose and Need and Project Objectives	1-2
	1.2.1 BLM Purpose and Need	1-2
	1.2.2 CEQA Project Objectives	1-3
	1.3 Relationship of Proposed Action to BLM Laws, Policies, Plans, and Programs	1-4
	1.3.1 Federal Land Policy Management Act	1-4
	1.3.2 Solar Energy Development Policy	1-5
	1.3.3 CDCA Plan	1-5
	1.3.4 Approved Resource Management Plan Amendments/ Record of Decision for Solar Energy Development in Six Southwestern States (Solar PEIS)	1-6
	1.3.5 Desert Renewable Energy Conservation Plan	1-6
	1.4 Relationship of the Project to County Requirements	1-8
	1.5 Document Organization	1-8
	1.6 Permits and Approvals	1-9
2.	**Proposed Action and Alternatives**	**2-1**
	2.1 Introduction	2-1
	2.2 Alternatives Development and Screening	2-1
	2.3 Proposed Land Use Plan Amendment Decisions	2-2
	2.4 Proposed Action (Alternative A)	2-2
	2.4.1 Project Location and Existing Land Use	2-3
	2.4.2 Project Facilities	2-4
	2.4.3 Construction	2-18

Page

Volume 1 (continued)

2. Proposed Action and Alternatives (continued)
2.4 Proposed Action (Alternative A) (continued)
2.4.4 Operation and Maintenance 2-23
2.4.5 Decommissioning and Site Reclamation 2-24
2.4.6 Applicant Proposed Measures 2-25
2.5 Action Alternatives 2-32
2.5.1 Alternative B 2-32
2.5.2 Alternative C 2-33
2.5.3 Alternative D 2-35
2.6 No Action/No Project Alternatives 2-36
2.6.1 Alternative E 2-36
2.6.2 Alternative F 2-36
2.6.3 Alternative G 2-37
2.7 Federal Lead Agency Preferred Alternative/CEQA Environmentally Superior Alternative 2-37
2.8 Alternatives Considered but Eliminated from Detailed Analysis 2-38

3. Environmental Analysis 3.1-1
3.1 Introduction 3.1-1
3.1.1 Baseline 3.1-1
3.1.2 Analytical Assumptions 3.1-2
3.1.3 Types of Effects 3.1-2
3.1.4 Resources and Uses Not Affected or Present in the Action Area 3.1-3
3.1.5 Cumulative Scenario 3.1-4
3.1.6 Mitigation Measures Identified in the Analysis 3.1-8
3.2 Air Resources 3.2-1
3.2.1 Introduction 3.2-1
3.2.2 Regional and Local Environmental Setting 3.2-1
3.2.3 Applicable Laws, Regulations, Plans, and Standards 3.2-6
3.2.4 Analytical Methodology 3.2-10
3.2.5 Applicant Proposed Measures 3.2-14
3.2.6 Direct and Indirect Effects 3.2-16
3.2.7 Cumulative Effects 3.2-30
3.2.8 Mitigation Measures 3.2-32
3.2.9 Residual Effects 3.2-32
3.2.10 CEQA Significance Thresholds and Determinations 3.2-32
3.3 Biological Resources – Vegetation 3.3-1
3.3.1 Introduction 3.3-1
3.3.2 Regional and Local Environmental Setting 3.3-2
3.3.3 Applicable Laws, Regulations, Plans, and Standards 3.3-14
3.3.4 Analytical Methodology 3.3-20
3.3.5 Applicant Proposed Measures 3.3-21
3.3.6 Direct and Indirect Effects 3.3-22
3.3.7 Cumulative Effects 3.3-30
3.3.8 Mitigation Measures 3.3-32
3.3.9 Residual Effects 3.3-37
3.3.10 CEQA Significance Thresholds and Determinations 3.3-38

Page

Volume 1 (continued)

3. Environmental Analysis (continued)

3.4 Biological Resources – Wildlife 3.4-1
3.4.1 Introduction 3.4-1
3.4.2 Regional and Local Environmental Setting 3.4-2
3.4.3 Applicable Laws, Regulations, Plans, and Standards 3.4-19
3.4.4 Analytical Methodology 3.4-24
3.4.5 Applicant Proposed Measures 3.4-25
3.4.6 Direct and Indirect Effects 3.4-29
3.4.7 Cumulative Effects 3.4-46
3.4.8 Mitigation Measures 3.4-51
3.4.9 Residual Effects 3.4-65
3.4.10 CEQA Significance Thresholds and Determinations 3.4-65
3.5 Climate Change 3.5-1
3.5.1 Introduction 3.5-1
3.5.2 Regional and Local Environmental Setting 3.5-1
3.5.3 Applicable Laws, Regulations, Plans, and Standards 3.5-4
3.5.4 Analytical Methodology 3.5-8
3.5.5 Applicant Proposed Measures 3.5-11
3.5.6 Direct and Indirect Effects 3.5-11
3.5.7 Cumulative Effects 3.5-22
3.5.8 Mitigation Measures 3.5-22
3.5.9 Residual Effects 3.5-22
3.5.10 CEQA Significance Thresholds and Determinations 3.5-23
3.6 Cultural Resources 3.6-1
3.6.1 Introduction 3.6-1
3.6.2 Regional and Local Environmental Setting 3.6-3
3.6.3 Applicable Regulations, Plans, and Standards 3.6-15
3.6.4 Analytical Methodology 3.6-22
3.6.5 Applicant Proposed Measures 3.6-25
3.6.6 Direct and Indirect Effects 3.6-26
3.6.7 Cumulative Effects 3.6-29
3.6.8 Mitigation Measures 3.6-30
3.6.9 Residual Effects 3.6-31
3.6.10 CEQA Significance Thresholds and Determinations 3.6-32
3.7 Geology and Soil Resources 3.7-1
3.7.1 Introduction 3.7-1
3.7.2 Regional and Local Environmental Setting 3.7-1
3.7.3 Applicable Laws, Regulations, Plans, and Standards 3.7-9
3.7.4 Analytical Methodology 3.7-12
3.7.5 Applicant Proposed Measures 3.7-13
3.7.6 Direct and Indirect Effects 3.7-13
3.7.7 Cumulative Effects 3.7-23
3.7.8 Mitigation Measures 3.7-24
3.7.9 Residual Effects 3.7-26
3.7.10 CEQA Significance Thresholds and Determinations 3.7-26
3.8 Hazards and Hazardous Materials 3.8-1
3.8.1 Introduction 3.8-1
3.8.2 Regional and Local Environmental Setting 3.8-1
3.8.3 Applicable Laws, Regulations, Plans, and Standards 3.8-6

Page

Volume 1 (continued)

3. Environmental Analysis (continued)

3.8 Hazards and Hazardous Materials (continued)
- 3.8.4 Analytical Methodology 3.8-15
- 3.8.5 Applicant Proposed Measures 3.8-17
- 3.8.6 Direct and Indirect Effects 3.8-17
- 3.8.7 Cumulative Effects 3.8-25
- 3.8.8 Mitigation Measures 3.8-26
- 3.8.9 Residual Effects 3.8-26
- 3.8.10 CEQA Significance Thresholds and Determinations 3.8-27

3.9 Lands and Realty 3.9-1
- 3.9.1 Introduction 3.9-1
- 3.9.2 Regional and Local Environmental Setting 3.9-1
- 3.9.3 Applicable Laws, Regulations, Plans, and Standards 3.9-2
- 3.9.4 Analytical Methodology 3.9-6
- 3.9.5 Applicant Proposed Measures 3.9-6
- 3.9.6 Direct and Indirect Effects 3.9-7
- 3.9.7 Cumulative Effects 3.9-9
- 3.9.8 Mitigation Measures 3.9-11
- 3.9.9 Residual Effects 3.9-11
- 3.9.10 CEQA Significance Thresholds and Determinations 3.9-11
- 3.9.11 CDCA Plan Consistency 3.9-13

3.10 Mineral Resources 3.10-1
- 3.10.1 Introduction 3.10-1
- 3.10.2 Regional and Local Environmental Setting 3.10-1
- 3.10.3 Applicable Laws, Regulations, Plans, and Standards 3.10-3
- 3.10.4 Analytical Methodology 3.10-5
- 3.10.5 Applicant Proposed Measures 3.10-6
- 3.10.6 Direct and Indirect Effects 3.10-6
- 3.10.7 Cumulative Effects 3.10-8
- 3.10.8 Mitigation Measures 3.10-9
- 3.10.9 Residual Effects 3.10-9
- 3.10.10 CEQA Significance Thresholds and Determinations 3.10-9

3.11 Noise 3.11-1
- 3.11.1 Introduction 3.11-1
- 3.11.2 Regional and Local Environmental Setting 3.11-1
- 3.11.3 Applicable Laws, Regulations, Plans, and Standards 3.11-6
- 3.11.4 Analytical Methodology 3.11-8
- 3.11.5 Applicant Proposed Measures 3.11-9
- 3.11.6 Direct and Indirect Effects 3.11-9
- 3.11.7 Cumulative Effects 3.11-14
- 3.11.8 Mitigation Measures 3.11-15
- 3.11.9 Residual Effects 3.11-15
- 3.11.10 CEQA Significance Thresholds and Determinations 3.11-15

3.12 Paleontological Resources 3.12-1
- 3.12.1 Introduction 3.12-1
- 3.12.2 Regional and Local Environmental Setting 3.12-1
- 3.12.3 Applicable Laws, Regulations, Plans, and Standards 3.12-3
- 3.12.4 Analytical Methodology 3.12-4
- 3.12.5 Applicant Proposed Measures 3.12-6

Page

Volume 1 (continued)

3. Environmental Analysis (continued)

3.12 Paleontological Resources (continued)
- 3.12.6 Direct and Indirect Effects 3.12-6
- 3.12.7 Cumulative Effects 3.12-8
- 3.12.8 Mitigation Measures 3.12-9
- 3.12.9 Residual Effects 3.12-10
- 3.12.10 CEQA Significance Thresholds and Determinations 3.12-10

3.13 Recreation 3.13-1
- 3.13.1 Introduction 3.13-1
- 3.13.2 Regional and Local Environmental Setting 3.13-1
- 3.13.3 Applicable Laws, Regulations, Plans, and Standards 3.13-5
- 3.13.4 Analytical Methodology 3.13-6
- 3.13.5 Applicant Proposed Measures 3.13-7
- 3.13.6 Direct and Indirect Effects 3.13-7
- 3.13.7 Cumulative Effects 3.13-11
- 3.13.8 Mitigation Measures 3.13-14
- 3.13.9 Residual Effects 3.13-14
- 3.13.10 CEQA Significance Thresholds and Determinations 3.13-14

3.14 Socioeconomics and Environmental Justice 3.14-1
- 3.14.1 Introduction 3.14-1
- 3.14.2 Regional and Local Environmental Setting 3.14-1
- 3.14.3 Applicable Laws, Regulations, Plans, and Standards 3.14-10
- 3.14.4 Analytical Methodology 3.14-11
- 3.14.5 Applicant Proposed Measures 3.14-12
- 3.14.6 Direct and Indirect Effects 3.14-13
- 3.14.7 Cumulative Effects 3.14-20
- 3.14.8 Mitigation Measures 3.14-27
- 3.14.9 Residual Effects 3.14-27
- 3.14.10 CEQA Significance Thresholds and Determinations 3.14-27

3.15 Special Designations 3.15-1
- 3.15.1 Introduction 3.15-1
- 3.15.2 Regional and Local Environmental Setting 3.15-1
- 3.15.3 Applicable Laws, Regulations, Plans, and Standards 3.15-8
- 3.15.4 Analytical Methodology 3.15-8
- 3.15.5 Applicant Proposed Measures 3.15-9
- 3.15.6 Direct and Indirect Effects 3.15-11
- 3.15.7 Cumulative Effects 3.15-11
- 3.15.8 Mitigation Measures 3.15-11
- 3.15.9 Residual Effects 3.15-11

3.16 Transportation and Travel Management 3.16-1
- 3.16.1 Introduction 3.16-1
- 3.16.2 Regional and Local Environmental Setting 3.16-1
- 3.16.3 Applicable Laws, Regulations, Plans, and Standards 3.16-3
- 3.16.4 Analytical Methodology 3.16-4
- 3.16.5 Applicant Proposed Measures 3.16-5
- 3.16.6 Direct and Indirect Effects 3.16-5
- 3.16.7 Cumulative Effects 3.16-14
- 3.16.8 Mitigation Measures 3.16-16
- 3.16.9 Residual Effects 3.16-16
- 3.16.10 CEQA Significance Thresholds and Determinations 3.16-17

Page

Volume 1 (continued)

3. Environmental Analysis (continued)

3.17 Utilities and Public Services 3.17-1
- 3.17.1 Introduction 3.17-1
- 3.17.2 Regional and Local Environmental Setting 3.17-1
- 3.17.3 Applicable Laws, Regulations, Plans, and Standards 3.17-3
- 3.17.4 Analytical Methodology 3.17-7
- 3.17.5 Applicant Proposed Measures 3.17-8
- 3.17.6 CEQA Significance Thresholds and Determinations 3.17-8

3.18 Visual Resources 3.18-1
- 3.18.1 Introduction 3.18-1
- 3.18.2 Regional and Local Environmental Setting 3.18-1
- 3.18.3 Applicable Laws, Regulations, Plans, and Standards 3.18-8
- 3.18.4 Analytical Methodology 3.18-13
- 3.18.5 Applicant-Proposed Measures 3.18-17
- 3.18.6 Direct and Indirect Effects 3.18-18
- 3.18.7 Cumulative Effects 3.18-31
- 3.18.8 Mitigation Measures 3.18-33
- 3.18.9 Residual Effects 3.18-38
- 3.18.10 CEQA Significance Thresholds and Determinations 3.18-38

3.19 Water Resources 3.19-1
- 3.19.1 Introduction 3.19-1
- 3.19.2 Regional and Local Environmental Setting 3.19-1
- 3.19.3 Applicable Laws, Regulations, Plans, and Standards 3.19-10
- 3.19.4 Analytical Methodology 3.19-16
- 3.19.5 Applicant Proposed Measures 3.19-18
- 3.19.6 Direct and Indirect Effects 3.19-20
- 3.19.7 Cumulative Effects 3.19-40
- 3.19.8 Mitigation Measures 3.19-42
- 3.19.9 Residual Effects 3.19-45
- 3.19.10 CEQA Significance Thresholds and Determinations 3.19-46

3.20 Wildland Fire Ecology 3.20-1
- 3.20.1 Introduction 3.20-1
- 3.20.2 Regional and Local Environmental Setting 3.20-1
- 3.20.3 Applicable Laws, Regulations, Plans, and Standards 3.20-3
- 3.20.4 Analytical Methodology 3.20-5
- 3.20.5 Applicant Proposed Measures 3.20-5
- 3.20.6 Direct and Indirect Effects 3.20-6
- 3.20.7 Cumulative Effects 3.20-9
- 3.20.8 Mitigation Measures 3.20-10
- 3.20.9 Residual Effects 3.20-11
- 3.20.10 CEQA Significance Thresholds and Determinations 3.20-11

3.21 Other CEQA Considerations 3.21-1
- 3.21.1 Energy Consumption 3.21-1
- 3.21.2 Mandatory Findings of Significance 3.21-9
- 3.21.3 Significant Unavoidable Environmental Impacts 3.21-10
- 3.21.4 Significant Irreversible Changes 3.21-11

Page

Volume 1 (continued)

4. Consultation, Coordination, and Public Involvement **4-1**
4.1 Interrelationships 4-1
4.1.1 Department of Defense 4-1
4.1.2 U.S. Army Corps of Engineers 4-1
4.1.3 California Department of Fish and Wildlife 4-2
4.1.4 California Department of Transportation 4-2
4.2 Consultation Processes for ESA Section 7, NHPA Section 106, and Indian Tribes 4-2
4.2.1 U.S. Fish and Wildlife Service 4-2
4.2.2 NHPA Section 106 Compliance and Tribal Consultation 4-2
4.3 Implementation, Monitoring, and Enforcement 4-4
4.3.1 Implementation 4-4
4.3.2 Monitoring 4-4
4.3.3 Enforcement and Adaptive Management 4-4
4.4 Public Involvement 4-5
4.4.1 Scoping 4-5
4.4.2 Public Comment Process 4-5
4.5 Administrative Remedies 4-6
4.6 List of Preparers 4-6

5. Acronyms and Abbreviations **5-1**

6. Glossary **6-1**

List of Tables

ES-1 Summary of Impacts by Alternative ES-7
ES-2 Summary of CEQA Impacts and Mitigation Measures for the Proposed Action ES-13
1-1 Summary of Potential Permit Requirements and Other Approvals 1-10
2-1 Proposed Action Estimated Temporary and Permanent Surface Disturbance 2-5
2-2 Operation and Maintenance-Related Water Use 2-12
2-3 Construction Waste Types, Volumes, and Management Approaches 2-15
2-4 Operation and Maintenance Workforce 2-24
2-5 Applicant Proposed Measures 2-26
2-6 Alternative B Estimated Temporary and Permanent Surface Disturbance 2-33
2-7 Alternative C Estimated Temporary and Permanent Surface Disturbance 2-34
2-8 Alternative D Estimated Temporary and Permanent Surface Disturbance 2-35
3.1-1 Cumulative Scenario 3.1-5
3.1-2 Renewable Energy Project Applications and Authorizations in the California Desert District 3.1-7
3.1-3 Existing and Reasonably Foreseeable Future Projects 3.1-9
3.2-1 Federal and State Ambient Air Quality Standards 3.2-2
3.2-2 Federal and State Attainment Status for the Project Area 3.2-3
3.2-3 Criteria Pollutant Maximum Ambient Concentrations 3.2-4
3.2-4 MDAQMD Air Quality Thresholds 3.2-14
3.2-5 Estimated Maximum Daily Construction Emissions for Proposed Action 3.2-16
3.2-6 Estimated Annual Construction Emissions for Proposed Action 3.2-17
3.2-7 Estimated Maximum Daily Operation and Maintenance Emissions for Proposed Action 3.2-18

Page

Volume 1 (continued)

List of Tables (continued)

3.2-8 Estimated Annual Operation and Maintenance Emissions for Proposed Action 3.2-19
3.2-9 Estimated Annual Emissions Generated within Federal Non-Attainment Areas 3.2-20
3.2-10 Estimated Annual Construction Emissions for Alternative B 3.2-21
3.2-11 Estimated Maximum Daily Operation and Maintenance Emissions for Alternative B 3.2-22
3.2-12 Estimated Annual Construction Emissions for Alternative C 3.2-24
3.2-13 Estimated Maximum Daily Operation and Maintenance Emissions for Alternative C 3.2-25
3.2-14 Estimated Annual Construction Emissions for Alternative D 3.2-27
3.2-15 Estimated Maximum Daily Operation and Maintenance Emissions for Alternative D 3.2-28
3.2-16 Estimated Maximum Daily Emissions for Importing Water for Construction 3.2-29
3.2-17 Estimated Maximum Daily Emissions for Importing Water for Operations and Maintenance 3.2-30
3.3-1 Vegetation Study Areas for the Soda Mountain Solar Project 3.3-2
3.3-2 Natural Communities and Cover Types on the Project Site 3.3-4
3.3-3 Invasive Weed Species in the Project Site 3.3-6
3.3-4 Special-Status Species Known or with Potential to Occur in the Study Area 3.3-9
3.3-5 Waters of the State on the Project Site 3.3-13
3.4-1 Wildlife Study Areas for the Soda Mountain Solar Project 3.4-1
3.4-2 Special-Status Wildlife Known to Occur or With Potential to Occur in the Study Area 3.4-5
3.4-3 Natural Communities and Cover Types on the Project Site 3.4-9
3.4-4 Comparison of Habitat Impacts to Desert Tortoise Habitat from All Project Alternatives 3.4-43
3.5-1 California Greenhouse Gas Emissions 3.5-3
3.5-2 Relevant Recommended Actions of Climate Change Scoping Plan 3.5-6
3.5-3 Estimated Annual Construction GHG Emissions for Proposed Action 3.5-11
3.5-4 Annual Operation and Maintenance GHG Emissions for the Proposed Action 3.5-12
3.5-5 Total Annual Long-Term GHG Emissions for the Proposed Action 3.5-13
3.5-6 Estimated Annual Construction GHG Emissions for Alternative B 3.5-16
3.5-7 Annual Operation and Maintenance GHG Emissions for Alternative B 3.5-17
3.5-8 Estimated Annual Construction GHG Emissions for Alternative C 3.5-18
3.5-9 Annual Operation and Maintenance GHG Emissions for Alternative C 3.5-18
3.5-10 Estimated Annual Construction GHG Emissions for Alternative D 3.5-20
3.5-11 Annual Operation and Maintenance GHG Emissions for Alternative D 3.5-20
3.5-12 Estimated Annual Construction Water Truck GHG Emissions for Alternative F 3.5-21
3.6-1 Cultural Complexes 3.6-5
3.6-2 Archaeological Sites Recorded within the APE 3.6-13
3.6-3 Isolated Artifacts Recorded within the APE 3.6-14
3.7-1 Modified Mercalli Intensity Scale 3.7-7
3.9-1 Authorized Land Uses within or in Close Proximity to the Project Site 3.9-3
3.9-2 Pending Applications within or in Close Proximity to the Project Site 3.9-4

Page

Volume 1 (continued)

List of Tables (continued)

3.9-3	Multiple-Use Class L, M, and I Land Use and Resource Management Guidelines	3.9-15
3.11-1	Modeled Ambient Traffic Noise Levels at Nearby Residences	3.11-5
3.11-2	OSHA-Permissible Noise Exposure Standards	3.11-6
3.11-3	Estimated Construction Noise Levels for the Proposed Action	3.11-10
3.12-1	Surface Geology and Paleontological Resource Potential of Geologic Units within 1 Mile of the Project Site	3.12-2
3.13-1	Reported Recreation Visits to Federal Areas in Vicinity of Project Fiscal Year 2011	3.13-2
3.13-2	Vehicles Routes in the Immediate Vicinity of the Project Site	3.13-5
3.13-3	Exits from I-15 within 50 Miles Project Site Exits	3.13-13
3.14-1	Historical and Projected Population of the Study Area	3.14-3
3.14-2	Housing Profile of the Regional Study Area (2010)	3.14-4
3.14-3	Employment by Industry Group	3.14-5
3.14-5	Geographic Scope of Environmental Justice Analysis by Resource	3.14-7
3.14-6	Racial and Income Characteristics for Residents within the Study Area	3.14-9
3.14-7	San Bernardino County Employment and Income Impacts from Project Construction	3.14-15
3.14-8	Regional Employment and Income Impacts from Project Operation and Maintenance	3.14-16
3.14-9	Average and Peak Construction Employment for Approved and Reasonably Foreseeable Projects	3.14-21
3.14-10	Operational Employment for Cumulative Scenario Projects	3.14-25
3.16-1	Existing Peak-Hour Traffic Volumes and Level of Service	3.16-2
3.16-2	Estimated Daily Vehicle Trips for Project Construction	3.16-6
3.16-3	Year 2014 and Year 2014 Plus Project Peak-Hour Traffic Volumes and Level of Service	3.16-8
3.16-4	Year 2017 and Year 2017 Plus Project Peak-Hour Traffic Volumes and Level of Service	3.16-10
3.16-5	Year 2014 and Year 2014 Plus Alternative F Peak-Hour Traffic Volumes and Level of Service	3.16-13
3.18-1	Visual Resource Management Classes	3.18-5
3.18-2	Visual Contrast Ratings	3.18-14
3.18-3	KOP Location and Characteristics	3.18-16
3.18-4	Visual Contrast Rating Summary - Structures	3.18-19
3.18-5	Viewing Times of Proposed Project from Routes	3.18-21
3.21-1	Electric Power Mix Delivered to SCE Retail Customers in 2011	3.21-3
3.21-2	Electric Power Mix Delivered to LADWP Retail Customers in 2011	3.21-4
4-1	List of Preparers	4-7

Page

Volume 2 – Appendices (CD inside front cover)

A. Figures **A-1**

1-1	Regional Context	A-3
1-2	Project Location	A-4
2-1	Proposed Project	A-5
2-2	Project Buildings	A-7
2-3	Substation Components	A-8
2-4	Access Road Typical Details	A-9
2-5	Alternative B	A-11
2-6	Alternative C	A-12
2-7	Alternative D	A-13
2-8	Potential Private Land Alternative	A-15
2-9	Cumulative Projects	A-16
2-10	Federal Ozone Non-attainment Area	A-17
3.3-1	Vegetation Communities within the Proposed Project ROW	A-19
3.3-2	Waters of the State within the Proposed Project ROW	A-20
3.3-3	Special Status Plants	A-21
3.4-1	Desert Tortoise Survey Findings	A-23
3.4-2	Mojave Fringe-toed Lizard Survey Findings	A-24
3.4-3	Burrowing Owl Survey Findings	A-25
3.4-4	Golden Eagle nesting within 10 miles of project	A-26
3.4-5	Bighorn Sheep	A-27
3.7-1	Regional Geology	A-28
3.7-2	Regional Faults	A-29
3.9-1	Designated Utility Corridor Location	A-30
3.11-1	Typical A-Weighted Sound Levels	A-31
3.12-1	Geology and Paleosensitivity	A-32
3.13-1	Recreational Resources in the Project Vicinity	A-33
3.15-1	Special Designations	A-34
3.18-1	Characteristic Landscape of the Project Site	A-35
3.18-2	Landscape Context Photos	A-36
3.18-3	Project Area and Viewshed	A-37
3.18-4	Visual Resource Inventory (VRI) Classifications	A-38
3.18-5	Key Observation Points	A-39
3.18-6	Photovoltaic Array Examples, Silver State North Solar	A-40
3.18-7	Photovoltaic Panels During Various Times of the Day, Cooper Mountain Solar Facility, Boulder City, NV	A-41
3.18-8	Inverter Treatment	A-42
3.18-9	Nighttime Lighting at PV Solar Facility Buildings	A-43
3.18-10	View from KOP 1, I-15 near Rasor Road Interchange, Looking North	A-44
3.18-11	View from KOP 4, I-15, Looking North	A-45
3.18-12	View from KOP 5, I-15, Looking Southwest	A-46
3.18-13	View form KOP 28, I-15 and Rasor Road Overpass, Looking East	A-47
3.18-14	View from KOP 29, Rasor Road, Looking East	A-48
3.19-1	Mojave River Watershed	A-49
3.19-2	Project Sub-Basins	A-50
3.19-3	Well and Spring Locations	A-51
3.19-4	Site Drainage	A-52
3.19-5	Flood and Erosion Potential	A-53
3.19-6	Groundwater Basins	A-55

Page

Volume 2 – Appendices (continued)

A. Figures (continued)
3.19-7 Sub-basin Geology A-56
3.19-8 Drainage Avoidance Areas A-57
3.19-9 Recommended Monitoring Well Locations A-58

B. Scoping Report B-1

C. Draft Commissioning and Closure Plan C-1

D. Air Quality and Greenhouse Gas Technical Report D-1

E. Biological Resources E-1
E-1 2013 Biological Resources Technical Report E.1-1
E-2 Draft Integrated Weed Management Plan E.2-1

F. Wilderness Characteristics Inventories F-1

G. BLM Form 8400-4, Visual Contrast Rating Worksheet G-1

H. Water Resources H-1
H-1 Water Supply Assessment H.1-1
H-2 Hydrogeologic Conditions and Groundwater Modeling Report H.2-1
H-3 Hydrogeological Conditions and Groundwater Modeling Report Addendum H.3-1

I. General Plan Consistency Analysis I-1

EXECUTIVE SUMMARY

ES.1 Background and Project Overview

Soda Mountain Solar LLC[1] (Applicant) proposes to construct, operate, maintain, and decommission the Soda Mountain Solar Project (SMSP) (Project). The Project is an approximately 358-megawatt (MW) photovoltaic (PV) solar energy generating facility and related infrastructure. If approved, the Project would be constructed on BLM-administered land in unincorporated San Bernardino County, California. The Project would generate and deliver solar-generated power to the California electrical grid through an interconnection to the Market Place-Adelanto 500 kV transmission line owned by Los Angeles Department of Water and Power (LADWP).This Draft Plan Amendment (PA) and Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) analyzes the Project's potential impacts under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This is a joint document published by the Bureau of Land Management (BLM) and San Bernardino County, California (County) (collectively, Lead Agencies).

To initiate the environmental review process under NEPA, the Applicant submitted a Standard Form (SF)-299 requesting a right-of-way (ROW) grant (Application CACA-049584) from the BLM for approximately 4,179 acres. Within these 4,179 acres, construction and operation would disturb approximately 2,557 acres. Following final engineering and micro-siting of the Project, areas that would remain undisturbed and not within fenced areas would not be included in the ROW grant. If a ROW grant is approved for the Project, then a land use plan amendment (PA) also would be required to identify the site in the California Desert Conservation Area Plan of 1980, as amended (CDCA Plan) as an appropriate site for the proposed use. The CDCA Plan Amendment also would require analysis of proposed impacts under NEPA. The BLM is the NEPA lead agency.

Additionally, the Applicant proposes to construct and operate several groundwater wells. The Applicant has submitted a well construction permit application to the County as required by San Bernardino County Code section 33.0630 et seq. The County's decision regarding issuance of the permit is a discretionary action requiring CEQA review and is separate from the BLM ROW process; however, the effects of the County's decision are evaluated as part of the Project within this Draft PA/EIS/EIR. San Bernardino County is the lead agency under CEQA.

[1] Soda Mountain Solar, LLC is a subsidiary of Bechtel Development Company, Inc.

ES.2 Purpose and Need

ES.2.1 BLM Purpose and Need

The BLM's purpose and need for the Project is to respond to the Applicant's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 USC §1761(a)(4)) for a ROW grant to construct, operate, maintain, and decommission a solar photovoltaic (PV) facility on public lands in compliance with FLPMA, BLM ROW regulations, and other applicable federal laws. In accordance with Section 103(c) of the FLPMA (43 USC §1702(a)), public lands are to managed for multiple uses that take into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant rights-of-way on public lands for systems of generation, transmission, and distribution of electric energy (43 USC §1761(a)(4)). Taking into account BLM's multiple use mandate, the BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant to the Applicant for the Project.

The Proposed Action, if approved, also would assist the BLM in addressing several management and policy objectives advanced through the following authorities applicable to BLM:

1. Executive Order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."
2. Secretarial Order 3285A1 (March 11, 2009, as amended February 22, 2010), which "establishes the development of renewable energy as a priority for the Department of the Interior."
3. The President's Climate Action Plan, released on June 25, 2013, which sets forth a new goal for the Department of the Interior to approve 20,000 MW of renewable energy projects on the public lands by 2020, in order to ensure America's continued leadership in clean energy.

The BLM's action also will include consideration of a concurrent amendment of the CDCA Plan. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission that are not identified in the CDCA Plan be added to it through the land use plan amendment process. CDCA boundaries are shown on Figure 1-1. The Project site is within the CDCA, but is not identified in the CDCA Plan for solar power generation. Therefore, if the BLM decides to approve the issuance of a ROW grant, a CDCA Plan amendment also would be required.

ES.2.2 CEQA Project Objectives

The needs and objectives of the Project are defined by the Applicant. This PA/EIS/EIR does not adopt or endorse the objectives that the Applicant has defined, which are to:

1. Create an economically viable source of clean renewable electricity generation;
2. Provide power to help California's utilities meet the growing demand for electrical power;

3. Locate the Project on an at-least- 2,500-acre site with high solar insolation, minimal vegetation, a relatively flat slope (i.e., under 5 percent), and highway access that also is located near existing transmission lines with available capacity to facilitate interconnection;
4. Meet Project needs while minimizing environmental impacts;
5. Provide renewable energy that assists California utilities in meeting Renewables Portfolio Standard targets; and
6. Provide a source of renewable energy that fulfills many federal energy policies.

The County, as CEQA Lead Agency, has distilled the Applicant's stated objectives into the "basic" objectives that have been relied upon in crafting alternatives to the Project (see CEQA Guidelines Section 15126.6).[2] The basic objectives of the Project are to construct, operate, maintain, and decommission a cost-efficient, environmentally sound solar powered generating facility on lands that meet fundamental technical requirements, including close proximity to transmission infrastructure.

ES.3 Proposed Action and Alternatives

ES.3.1 Comparison of Alternatives

This PA/EIS/EIR considers five action alternatives consisting of a Plan Amendment and Project components, and two No Action/No Project alternative. Each of the following alternatives is described in detail in Chapter 2, *Proposed Action and Alternatives*:

Alternative A: Proposed Action. The Proposed Action would consist of the North, East, and South arrays for a maximum combined capacity of 358 MW. This alternative also would include collector lines, a substation and switchyard, operation and maintenance buildings, up to three groundwater wells, and a realignment of the existing Rasor Road. This alternative would occupy approximately 2,222 acres on BLM-administered land. This alternative would require a CDCA Plan Amendment and County approval of a groundwater well permit.

Alternative B. This alternative would consist only of the East and South arrays, for a maximum combined capacity of 264 MW. It would occupy 1,647 acres of BLM-administered land, and would include only two groundwater wells. An alternative realignment of Rasor Road is analyzed under Alternative B; however, this and Alternatives A and C could be supported by either Rasor Road realignment route. This alternative would require a CDCA Plan Amendment and County approval of a groundwater well permit.

Alternative C. This alternative would consist only of the North and South arrays, for a maximum combined capacity of 298 MW. It would occupy 1,823 acres of BLM-administered land, and

[2] Section 15126.6 requires an EIR to describe a range of reasonable alternatives to the project, or its location, that feasibly would attain *most of the basic objectives* of the project even if these alternatives would impede to some degree the attainment of the project objectives as stated by the Applicant. The range of alternatives analyzed in this PA/EIS/EIR is described in Section 2.4

would include only two groundwater wells. This alternative would require a CDCA Plan Amendment and County approval of a groundwater well permit.

Alternative D. This alternative would consist of the North and East arrays and only two sub-units of the South Array (South 1 and South 2). East 1 and South 2 arrays would also be reduced in size compared to the Proposed Action. The maximum capacity would be 250 MW. It would occupy 1,717 acres of BLM-administered land, and would include three groundwater wells. Additionally, Rasor Road would not be realigned under this alternative, and the operation and maintenance area buildings and brine ponds would be constructed within the footprint of the reduced South Array. This alternative would require a CDCA Plan Amendment and County approval of a groundwater well permit.

Alternative E: No Action/No Project. Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the groundwater well permit. Because the Project would not be approved, no new structures or facilities would be constructed, operated and maintained, or decommissioned on the site, and no related ground disturbance or other Project impacts would occur.

Alternative F: CEQA No Project. This alternative describes the scenario that could result if the BLM were to approve the requested ROW grant under Alternative A, B, C, or D and the County were to deny the requested groundwater well permit application (i.e., select Alternative E). In this event, a PV solar energy facility and related infrastructure could be developed on the site but would require an off-site source of water for potable use, dust control, panel washing, and fire protection. This alternative would require a CDCA Plan Amendment.

Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit. This alternative describes the scenario that could result if the BLM were not to approve a ROW grant for the Project and were to amend CDCA Plan to identify the ROW area as unsuitable for solar development, and the County were to deny the requested groundwater well permit application. In this event, a solar energy facility and related infrastructure would not be developed on the site.

ES.3.2 Lead Agency Preferred Alternative

Under NEPA, the “preferred alternative” is a preliminary indication of the Lead Agency’s preference of action among the Proposed Action and alternatives. A NEPA Lead Agency may select a preferred alternative for a variety of reasons, including the agency’s priorities, in addition to the environmental considerations discussed in the EIS. In accordance with NEPA (40 CFR 1502.14(e)), the BLM preliminarily has identified Alternative A, the Proposed Action, as the preferred alternative.

CEQA Guidelines Section 15126.6(e)(2) requires an EIR to identify an environmentally superior alternative. If the environmentally superior alternative is the No Project Alternative, the EIR also must identify an environmentally superior alternative from among the other alternatives. In general, the environmentally superior alternative is defined as that alternative with the least adverse impacts to the project area and its surrounding environment.

The No Action/No Project alternative (Alternative E) would avoid all impacts of the Project and would not create any new significant impacts of its own. However, as noted in Section 3.5, Alternative E would not offset greenhouse gas emissions associated with fossil fuel electricity generation. The CEQA Guidelines define the environmentally superior alternative as that alternative with the least adverse impacts to the project area and its surrounding environment; therefore, Alternative E is considered the environmentally superior alternative for CEQA purposes because it would not create any of the localized impacts of the Project, even though would have a less beneficial impact than that of the Project on greenhouse gases. Alternative E would fail to meet the basic objectives of the Project set forth in Section 1.2.2 of constructing, operating, maintaining, and decommissioning a cost-efficient, environmentally sound solar-powered generating facility on lands that meet fundamental tehcnical requirements, including close proximity to transmission infrastructure.

Determining an environmentally superior alternative is difficult because of the many factors that must be balanced. Although this Draft PA/EIS/EIR preliminarily identifies an environmentally superior alternative, it is possible that, with additional information received in or developed in response to comments, the County could choose to balance the importance of each impact area differently or reach a different conclusion during the project approval process. The County preliminarily has identified Alternative B (including approval of a groundwater well permit) as the environmentally superior alternative because it would result in 575 fewer acres of permanent disturbance and 59 fewer acres of temporary disturbance compared to the Proposed Action, and would disturb the fewest acres among Alternatives A, B, C, or D. Additionally, Alternative B would result in the fewest acres of waters of the State disturbed among these action alternatives. Alternative F is not preliminarily identified as the environmentally superior alternative because while it would avoid potential less-than-significant impacts on tui chub and groundwater supplies, it would exacerbate the significant and unavoidable impact related to criteria air pollutant emissions.

ES.4 Cumulative Scenario

Many renewable energy and other projects are proposed throughout the California desert that were identified as potentially contributing to cumulative environmental impacts. Those cumulative projects are discussed in detail in Section 3.1.5, *Cumulative Scenario*.

ES.5 Environmental Consequences

Table ES-1 summarizes the environmental impacts that would occur as a result of the Proposed Action and alternatives by environmental parameter. Table ES-2 addresses CEQA requirements, summarizing impacts, significance determinations, and mitigation measures for the Proposed Action by environmental parameter.

ES.5.1 Areas of Controversy

Comments were received during the scoping process for the Proposed Action. The scoping process is described and public input received during that process is provided in Appendix B, *Scoping Report*. Based on input received from agencies, members of the public and others, areas of controversy related to the Project include:

Air Resources: Concerns related to potential air quality impacts as compared to national and state ambient air quality standards. See Section 3.2, *Air Resources*.

Biological Resources: Concerns related to the disturbance of native habitats. Specific areas of controversy relating to biological resources relate to wildlife connectivity, sensitive plant communities, special-status species, and mitigation measures. See Sections 3.3, *Biological Resources – Vegetation*; and 3.4, *Biological Resources – Wildlife*.

Cultural Resources: Concerns related to damage and loss of cultural and historic artifacts and other resources; including Indian sacred sites. See Section 3.6, *Cultural Resources*.

Hazards and Public Safety: Concerns related to the use and disposal of hazardous materials and wastes. See Section 3.8, *Hazards and Hazardous Materials*.

Visual Resources: Concerns related to the effects of night lighting and industrial facilities on the visual landscape surrounding the Project site and degradation of the visitor experience in the general area. See Section 3.18, *Visual Resources*.

Water Resources: Concerns related generally to surface water and groundwater use and associated effects, and specifically to potential impacts on biological resources related to groundwater drawdown. See Section 3.19, *Water Resources*.

Alternatives: Concerns related to adequacy of the range of alternatives. See Chapter 2, *Proposed Action and Alternatives*.

ES.5.1.1 Issues to be Resolved

The BLM will decide whether to grant the requested ROW, grant the ROW with modifications, or deny the ROW. Modifications may include modifying the proposed use or changing the route or location of the proposed facilities (43 CFR 2805.10(a)(1)). The BLM also will decide whether or not to amend the CDCA Plan to identify the application area as suitable for the proposed solar energy development.

The County will decide whether to approve, modify, or deny the requested groundwater well permit.

TABLE ES-1
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Air Resources	*Construction (max)*: ROG=10.18 tons/yr; NOx=41.47 tons/yr; CO=53.64 tons/yr; SOx=0.11 tons/yr; PM10=29.51 tons/yr; and PM2.5=3.76 tons/yr. *Operation and Maintenance*: ROG= 2.05 lbs/day; NOx=16.37 lbs/day; CO=30.85 lbs/day; SOx=0.07 lbs/day; PM10=70.11 lbs/day; and PM2.5=7.14 lbs/day. *Decommissioning*: Comparable in type and magnitude, but likely to be lower than, the construction emissions Maximum daily construction-related NOx, CO, PM10 emissions would exceed MDAQMD thresholds	*Construction (max)*: ROG=9.64 tons/yr; NOx=38.93 tons/yr; CO=49.57 tons/yr; SOx=0.10 tons/yr; PM10=26.71 tons/yr; and PM2.5=3.35 tons/yr. *Operation and Maintenance*: ROG= 1.62 lbs/day; NOx=13.44 lbs/day; CO=25.38 lbs/day; SOx=0.06 lbs/day; PM10=51.75 lbs/day; and PM2.5=5.32 lbs/day. *Decommissioning*: Comparable in type and magnitude, but likely to be lower than, the construction emissions Maximum daily construction-related NOx, CO, PM10 emissions would exceed MDAQMD thresholds	*Construction (max)*: ROG=9.95 tons/yr; NOx=40.26 tons/yr; CO=51.46 tons/yr; SOx=0.11 tons/yr; PM10=27.80 tons/yr; and PM2.5=3.51 tons/yr. *Operation and Maintenance*: ROG= 1.78 lbs/day; NOx=14.50 lbs/day; CO=27.36 lbs/day; SOx=0.06 lbs/day; PM10=58.39 lbs/day; and PM2.5=5.98 lbs/day. *Decommissioning*: Comparable in type and magnitude, but likely to be lower than, the construction emissions Maximum daily construction-related NOx, CO, PM10 emissions would exceed MDAQMD thresholds	*Construction (max)*: ROG=8.94 tons/yr; NOx=36.16 tons/yr; CO=46.24 tons/yr; SOx=0.09 tons/yr; PM10=25.06 tons/yr; and PM2.5=3.16 tons/yr. *Operation and Maintenance*: ROG= 1.56 lbs/day; NOx=13.01 lbs/day; CO=24.56 lbs/day; SOx=0.05 lbs/day; PM10=49.02 lbs/day; and PM2.5=5.04 lbs/day. *Decommissioning*: Comparable in type and magnitude, but likely to be lower than, the construction emissions Maximum daily construction-related NOx, CO, PM10 emissions would exceed MDAQMD thresholds	No impact	Alternative A, B, C, or D emissions plus the following: *Construction*: ROG=0.55 lbs/day; NOx=15.00 lbs/day; CO=2.54 lbs/day; SOx=0.02 lbs/day; PM10=30.38 lbs/day; and PM2.5=2.96 lbs/day. *Operation and Maintenance*: ROG= 0.38 lbs/day; NOx=4.95 lbs/day; CO=1.89 lbs/day; SOx=0.01 lbs/day; PM10=14.17 lbs/day; and PM2.5=1.56 lbs/day. *Decommissioning*: Comparable in type and magnitude to construction emissions
Biological Resources - Vegetation	2,455.57 acres vegetation disturbed 498.68 acres waters of the State within site	1,811.9 acres vegetation disturbed 348.89 acres waters of the State within site	2,021.60 acres of vegetation disturbed 462.72 acres waters of the State within site	1,868.94.96 acres vegetation disturbed 446.44 acres waters of the State within site	No impact	No change from Alternatives A, B, C, or D impacts
Biological Resources - Wildlife	2,445.57 acres of habitat disturbed Potential collision risk for birds Impacts to bighorn sheep movement corridor Indirect impacts to off-site habitat from invasive plants	1,817.47 acres of habitat disturbed Potential collision risk for birds May retain portions of the bighorn sheep movement corridor Reduced indirect impacts to off-site habitat from invasive plants	2,023.62 acres of habitat disturbed Potential collision risk for birds May retain portions of the bighorn sheep movement corridor Reduced indirect impacts to off-site habitat from invasive plants	1,872.5 acres of habitat disturbed Potential collision risk for birds Impacts to bighorn sheep movement corridor Reduced indirect impacts to off-site habitat from invasive plants	No impact	Similar to Alternatives A, B, C, or D impacts Would avoid potential for impacts to tui chub habitat associated with groundwater drawdown

TABLE ES-1 (Continued)
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Climate Change	Net reduction of over 280,470 metric tons CO_2e per year	Net reduction of over 206,820 metric tons CO_2e per year	Net reduction of over 233,483 metric tons CO_2e per year	Net reduction of over 195,685 metric tons CO_2e per year	No impact, no net reduction of CO_2e	Alternative A, B, C, or D emissions plus additional 94 metric tons CO_2e emitted per year
Cultural Resources	Direct impacts to 4 archaeological sites and 36 isolates	Direct impacts to 3 archaeological sites and 31 isolates	Direct impacts to 4 archaeological sites and 31 isolates	Direct impacts to 2 archaeological sites and 27 isolates	No impact	No change from Alternatives A, B, C, or D impacts
Geology and Soil Resources	Low potential for adverse soil conditions, ground subsidence due to groundwater pumping, or seismic-related ground failures. Potential for wind and water erosion.	Similar but reduced potential for adverse soil conditions; similar potential for ground subsidence or seismic-related ground failures. Reduced potential for erosion due to smaller site.	Similar potential for adverse soil conditions; similar potential for ground subsidence or seismic-related ground failures. Reduced potential for erosion due to smaller site.	Similar b potential for adverse soil conditions; similar potential for ground subsidence or seismic-related ground failures. Reduced potential for erosion due to smaller site.	No impact	Soil, seismic, and erosion effects similar to Alternatives A, B, C, and D; avoids potential for subsidence due to groundwater pumping.
Hazards and Hazardous Materials	Low likelihood of accidental release of hazardous materials used on site. Low potential for worker exposure to valley fever.	Similar but reduced likelihood of accidental release of hazardous materials used on site or potential for worker exposure to valley fever due to smaller site.	Similar but reduced likelihood of accidental release of hazardous materials used on site or potential for worker exposure to valley fever due to smaller site.	Similar but reduced likelihood of accidental release of hazardous materials used on site or potential for worker exposure to valley fever due to smaller site.	No impact	Similar to Alternatives A, B, C, or D, with additional potential for accidental release of fuels, oils, and/or lubricants from additional truck trips.
Lands and Realty	Restriction of use on 2,222 acres of Class L, M, and I lands Restriction of available width of designated utility corridor	Restriction of use on 1,647 acres of Class L, M, and I lands Reduced impact on designated utility corridor	Restriction of use on 1,823 acres of Class L, M, and I lands Similar impact on designated utility corridor	Restriction of use on 1,717 acres of Class L, M, and I lands Similar impact on designated utility corridor	No impact	No change from Alternatives A, B, C, or D impacts
Mineral Resources	2,222 acres precluded from aggregate mineral exploration and production	1,647 acres precluded from aggregate mineral exploration and production	1,823 acres precluded from aggregate mineral exploration and production	1,717 acres precluded from aggregate mineral exploration and production	No impact	No change from Alternatives A, B, C, or D impacts
Noise	*Construction and Decommissioning*: short-term noise increases over ambient noise levels would be a maximum of 5 dBA during daytime hours and 8 dBA during nighttime hours at the nearest sensitive receptor.	*Construction and Decommissioning*: short-term noise increases over ambient noise levels would be a maximum of 10 dBA during daytime hours and 13 dBA during nighttime hours at the nearest sensitive receptor.	*Construction and Decommissioning*: Similar to Proposed Action *Operation and Maintenance*: noise levels would be imperceptible at the nearest sensitive receptor.	*Construction and Decommissioning*: Similar to Proposed Action *Operation and Maintenance*: noise levels would be imperceptible at the nearest sensitive receptor.	No impact	Additional truck trips would be expected to increase the Project-related noise levels by less than 1 dBA.

TABLE ES-1 (Continued)
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Noise (cont.)	*Operation and Maintenance*: noise levels would be imperceptible at the nearest sensitive receptor.	*Operation and Maintenance*: noise levels would be imperceptible at the nearest sensitive receptor.				
Paleontological Resources	2.21 acres of moderately paleontologically sensitive older alluvium disturbed. Potential damage and/or destruction of paleontological resources throughout solar plant site.	32.5 acres of moderately paleontologically sensitive older alluvium disturbed. Reduced potential for damage and/or destruction of paleontological resources throughout solar plant site.	2.21 acres of moderately paleontologically sensitive older alluvium disturbed. Potential damage and/or destruction of paleontological resources throughout solar plant site.	No moderately paleontologically sensitive older alluvium disturbed. Potential damage and/or destruction of paleontological resources throughout solar plant site.	No impact	Slightly reduced potential for damage and/or destruction of paleontological resources due reduced drilling.
Recreation	*Construction and Decommissioning*: impacts from noise, fugitive dust, and traffic. Closure of two open routes. *Operation and Maintenance*: Site not available for recreational use. Permanent closure and relocation of one OHV route.	*Construction and Decommissioning*: reduced duration of impacts from noise, fugitive dust, and traffic. *Operation and Maintenance*: Reduced acreage unavailable for recreational use. Same effect on OHV route as Proposed Action.	*Construction and Decommissioning*: reduced duration of impacts from noise, fugitive dust, and traffic. *Operation and Maintenance*: Reduced acreage unavailable for recreational use. Same effect on OHV route as Proposed Action.	*Construction and Decommissioning*: reduced duration of impacts from noise, fugitive dust, and traffic. *Operation and Maintenance*: Reduced acreage unavailable for recreational use. Same effect on OHV route as Proposed Action.	No impact	Similar to Alternatives A, B, C, or D, with additional traffic impacts.
Socioeconomics and Environmental Justice	*Construction:* Employment of 215 workers (average) and 290 workers (peak). Most, if not all, expected to live within two hours of site. • No new housing or motel development induced. • Total direct construction employee compensation income of $300 million. • Total economic output of $755 million.	*Construction*: Shorter duration of employment of temporary workers and economic benefit, but same number of workers and same annual labor income effect. *Operation and Maintenance:* Reduced employment and economic benefit in proportion to reduced size and capacity of solar plant.	*Construction*: Shorter duration of employment of temporary workers and economic benefit, but same number of workers and same annual labor income effect. *Operation and Maintenance:* Reduced employment and economic benefit in proportion to reduced size and capacity of solar plant.	*Construction*: Shorter duration of employment of temporary workers and economic benefit, but same number of workers and same annual labor income effect. *Operation and Maintenance:* Reduced employment and economic benefit in proportion to reduced size and capacity of solar plant.	No impact and no economic benefit	Similar to Alternatives A, B, C, or D, with potential minor increase in job effects for water delivery to site.

TABLE ES-1 (Continued)
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Socioeconomics and Environmental Justice (cont.)	*Operation and Maintenance:* Annual employment of up to 40 workers, expected to live close to the site. • No new housing growth induced. • Total annual direct employee compensation of $2.9 million. • Total annual indirect and induced economic benefits of $9.7 million and 60 jobs. *Decommissioning:* Temporary spending and employment benefit from deconstruction. No environmental justice impacts.	*Decommissioning:* Reduced temporary spending and employment benefit from deconstruction. No environmental justice impacts.	*Decommissioning:* Reduced temporary spending and employment benefit from deconstruction. No environmental justice impacts.	*Decommissioning:* Reduced temporary spending and employment benefit from deconstruction. No environmental justice impacts.		
Special Designations	No direct impacts. Potential minor indirect effects from dust, noise, traffic, and visual contrast.	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action	No impact	Same as Proposed Action
Transportation and Travel Management	*Construction and Decommissioning*: increased traffic (410 daily trips) with no change in LOS on affected roadways. *Operation and Maintenance*: minor traffic increase.	*Construction and Decommissioning*: Reduced duration of traffic increases. *Operation and Maintenance*: Slightly reduced traffic increase.	*Construction and Decommissioning*: Reduced duration of traffic increases. *Operation and Maintenance*: Slightly reduced traffic increase.	*Construction and Decommissioning*: Reduced duration of traffic increases. *Operation and Maintenance*: Slightly reduced traffic increase.	No impact	Additional truck trips with no change in LOS on affected roadways.
Utilities and Public Services	*Construction*: 384 to 480 acre-feet of water consumption	*Construction*: Reduced water consumption	*Construction*: Reduced water consumption	*Construction*: Reduced water consumption	No impact	Water acquired from an off-site source and delivered by truck.

TABLE ES-1 (Continued)
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Utilities and Public Services (cont.)	*Operation and Maintenance*: 1,275 to 1,371 acre-feet of water consumption *Decommissioning*: PV panels recycled; non-recyclable solid waste landfilled. Adequate landfill capacity exists. No impact to public services.	*Operation and Maintenance*: reduced water consumption *Decommissioning*: reduced amount of non-recyclable solid waste landfilled. No impact to public services.	*Operation and Maintenance*: reduced water consumption *Decommissioning*: reduced amount of non-recyclable solid waste landfilled. No impact to public services.	*Operation and Maintenance*: reduced water consumption *Decommissioning*: reduced amount of non-recyclable solid waste landfilled. No impact to public services.		
Visual Resources	*Construction*: Mitigable short-term impacts from construction lighting and visible dust plumes; adverse effects from large-scale visual disturbance in the landscape. *Operation and Maintenance*: Would not meet VRM Class III objectives. *Decommissioning*: Similar to construction. Site would be restored after decommissioning.	Similar to Proposed Action, but occurring on a smaller land area. May be less visible from some viewpoints.	Similar to Proposed Action, but occurring on a smaller land area. May be less visible from some viewpoints.	Similar to Proposed Action, but occurring on a smaller land area. May be less visible from some viewpoints.	No impact	Additional visual impacts from truck traffic
Water Resources	Pumping/Consumption of up to 480 acre-feet of groundwater during construction and 31.4 acre-feet per year during operation, mitigable potential impacts to groundwater basin. Mitigable alteration of stormwater flows and drainage, including re-routing of existing flowpaths.	Pumping/Consumption of up to 354 acre-feet of groundwater during construction and 25 acre-feet per year during operation. Reduced intensity of impacts related to water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flooding.	Pumping/Consumption of up to 400 acre-feet of groundwater during construction and 28 acre-feet per year during operation. Reduced intensity of impacts related to water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flooding.	Pumping/Consumption of up to 355 acre-feet of groundwater during construction and 24 acre-feet per year during operation. Reduced intensity of impacts related to water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flooding.	No impact	No pumping and no impact on groundwater basin. Other impacts similar to Alternatives A, B, C, or D.

TABLE ES-1 (Continued)
SUMMARY OF IMPACTS BY ALTERNATIVE

Resource	Alternative A: Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Water Resources (cont.)	Mitigable risk from on-site flooding. Mitigable water quality effects including use of heavy machinery and erosion and sedimentation during construction and decommissioning, and use of septic system, evaporation ponds, and spill cleanup facilities during operation.					
Wildland Fire Ecology	*Construction and Decommissioning*: Slight increase in threat of wildland fires in area due to construction and demolition activities. *Operation and Maintenance*: increased risk of wildland fire due to establishment of non-native plants.	Reduced risk of wildland fires compared to Proposed Action due to smaller site footprint and reduced disturbance of native vegetation.	Reduced risk of wildland fires compared to Proposed Action due to smaller site footprint and reduced disturbance of native vegetation.	Reduced risk of wildland fires compared to Proposed Action due to smaller site footprint and reduced disturbance of native vegetation.	No impact	Slight increase in risk of wildfire resulting from additional truck traffic to site.

TABLE ES-2
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Air Quality			
Impact Air-1: Construction and decommissioning of the Proposed Action would generate short-term emissions of criteria air pollutants that could contribute to an existing or projected air quality violation.	Significant and unavoidable	**Mitigation Measure 3.2-2:** During construction, vehicles and equipment shall not idle for more than 5 minutes if not moving or performing construction activities. The use of idling vehicle air conditioner units to reduce the effects of heat shall be prohibited unless required for a medical emergency.	Significant and unavoidable
Impact Air-2: Operation and maintenance of the Proposed Action would generate long-term emissions of criteria air pollutants that could contribute to an existing or projected air quality violation.	Significant	**Mitigation Measure 3.2-1:** The Applicant shall apply water twice daily to all unpaved roads and unpaved parking areas actively used during operation and maintenance, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.	Less than significant
Impact Air-3: The Proposed Action would generate emissions of criteria air pollutants which could contribute to existing non-attainment conditions and further degrade air quality.	Significant and unavoidable	**Implement Mitigation Measures 3.2-1 and 3.2-2 (above).**	Significant and unavoidable
Impact Air-4: The Proposed Action would expose residences to toxic air contaminants.	Less than significant	None required.	Less than significant
Impact Air-5: The Proposed Action would generate odors from diesel equipment that could affect people in the area.	Less than significant	None required.	Less than significant
Biological Resources - Vegetation			
Impact Veg-1: The Project would indirectly affect special-status plants.	Significant	**Mitigation Measure 3.3-2:** Vegetation Best Management Practices. The Applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to vegetation resources: 1. *Limit Area of Disturbance.* The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, Project vehicles and equipment shall be confined to the flagged areas. 2. *Minimize Road Impacts.* New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Vegetation (cont.)			
Impact Veg-1 (cont.)		3. *Minimize Traffic Impacts.* Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. 4. *Monitor During Construction.* In areas that have not been fenced with desert tortoise exclusion fencing and cleared, a Designated Biologist shall be present at the construction site during all Project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall review areas immediately ahead of equipment during brushing and grading activities. 5. *Minimize Impacts of Staging Areas.* Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing. For construction activities outside of the solar plant site, access roads, pulling sites, and storage and parking areas shall be designed, utilized, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. 6. *Avoid Use of Toxic Substances.* Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to plants and wildlife. 7. *Implement Erosion Control Measures.* Standard erosion control measures shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter "waters of the State". Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into drainages. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential. To avoid impacts associated with generation of fugitive dust, surface application of water would be employed during construction and operation and maintenance activities. 8. *Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization.* If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife. 9. *Revegetation of Temporarily Disturbed Areas.* The Applicant shall prepare and implement a Revegetation Plan to restore all areas subject to temporary disturbance to pre-Project grade and conditions. Temporarily disturbed areas within the Project site include, but are not limited to: all proposed locations for linear facilities, temporary access roads, berms, areas surrounding the drainage diffusers, construction work temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas. The Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and the following performance standards by the end of monitoring year 2: a. at least 80 percent of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Vegetation (cont.)			
Impact Veg-1 (cont.)		b. relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60 percent. 10. *Integrated Weed Management Plan.* This measure provides further detail and clarifies requirements for the Applicant's draft Integrated Weed Management Plan (IWMP) (see Appendix E-2). Prior to beginning construction on the Project, the Applicant shall prepare, circulate to the BLM for comment and approval, and then implement an IWMP that meets the approval of BLM's Authorized Officer and conforms to the CDCA Plan (Table 1) to prevent the spread of existing invasive species and the introduction of new invasive species to the Project site. The Plan shall be consistent with BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM, 2007) and the National Invasive Species Management Plan (National Invasive Species Council, 2008). The IWMP shall include, at a minimum: specific management objectives and measures for each target invasive species; baseline conditions; weed risk assessment; measures (both preventative and containment/control) to prevent/limit the introduction and spread of invasive species; monitoring and surveying methods; and reporting requirements. The BLM-approved IWMP shall include: a. Preventative measures to prevent the spread of weeds into new habitats, such as equipment inspections, use of weed-free erosion control materials and soils, and a mandatory site training element that includes weed management; b. Weed containment and control measures such as the removal of invasive species primarily via mechanical means, with the use of herbicides restricted to BLM-policies and approved usage (e.g., BLM's *Herbicide Use Standard Operating Procedures* provided in Appendix B of the Record of Decision for the *Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement* (BLM, 2007); c. Monitoring and reporting standards annually during construction and for three years following the completion of construction to describe trend in weed distribution and direct weed management measures, and; Reporting of monitoring and management efforts in annual reports and a final monitoring report completed at the end of three years of post-construction monitoring. Copies of these reports will be provided to the BLM for review and comment. The BLM will use the results of these reports to determine if any additional monitoring or control measures are necessary. Weed control will be ongoing on the Project site for the life of the Project, but plan success will be determined by the BLM after the three years of operations monitoring through the reporting and review process. Success criteria will be defined as having no more than 10 percent increase in a weed species or in overall weed cover in any part of the Project site. **Mitigation Measure 3.3-3:** Special-Status Plant Species and Cacti Impact Avoidance and Minimization. This measure will avoid unintended impacts to special-status plants on the Project site (i.e., Emory's crucifixion thorn) and provide for the salvage of protected cacti prior to construction. This measure includes the following requirements:	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Vegetation (cont.)			
Impact Veg-1 (cont.)		1. The Applicant shall establish Environmental Exclusion Areas (EEAs) around Emory's crucifixion thorn plants that have been identified on the Project site (Figure 3.3-3). A minimum 100-foot exclusion area shall be established around the plants, which shall be clearly identified and maintained throughout construction to ensure that avoided plants are not inadvertently harmed. EEAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages or compensatory mitigation. 2. *Worker Environmental Awareness Program* (WEAP). The WEAP (APM 44; Mitigation Measure 3.4-1c) shall include training components specific to protection of special-status plants that occur on the Project site. 3. *Herbicide and Soil Stabilizer Drift Control Measures.* Special-status plant occurrences within 100 feet of the Project Disturbance Area, including Utah vine milkweed, shall be protected from herbicide and soil stabilizer drift. The IWMP (APM 50 and Mitigation Measure 3.3-2) includes measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's The Global Invasive Species Team (Hillmer and Liedtke, 2003), the USEPA, and the Pesticide Action Network Database. *Erosion and Sediment Control Measures.* Erosion and sediment control measures shall not inadvertently impact special-status plants (e.g., by using invasive or non-Mojave Desert native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). These measures shall be incorporated in the Comprehensive Drainage, Erosion, and Sedimentation Control Plan (Mitigation Measure 3.19-2). 4. *Preconstruction Cacti Salvage.* The Applicant shall develop a *Vegetation Resources Management Plan* that details the methods for the salvage and transplantation of target succulent species that would be affected by the Project. The Plan shall be submitted to the BLM AO for review and approval and shall include at a minimum the following elements: a. The location of target plants on the Project site; b. Criteria for determining which individual plants are appropriate for salvage; c. The proposed methods for salvage, propagation, transport, and planting; d. Procedures for identifying target species during preconstruction clearance surveys; e. Considerations for storing salvaged plants or pre-planting requirements; f. Suggested transplantation sites; g. A requirement for 10 years of maintenance of the transplanted individuals, including removal of invasive species and irrigation (if necessary); and h. A requirement for 10 years of monitoring to determine the percentage of surviving plants each year and to adjust maintenance activities using an adaptive management approach.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Vegetation (cont.)			
Impact Veg-2: The Project would result in direct and indirect impacts to waters of the State.	Significant	**Mitigation Measure 3.3-5:** Decommissioning and Reclamation Plan. At least 12 months prior to Project closure, the Applicant shall prepare a draft Decommissioning and Reclamation Plan to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project site. The Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities, and shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from the BLM AO in consultation with USFWS and CDFW. **Implement Mitigation Measure 3.3-2 (above).**	Less than significant
Biological Resources – Wildlife			
Impact Wild-1: The Proposed Action would have substantial adverse direct and indirect effects on desert tortoise.	Significant	**Mitigation Measure 3.4-1a: Compliance Monitoring by the Designated Biologist.** Prior to ground-disturbing activities, an individual shall be designated and approved by the BLM and Resources Agencies (USFWS and CDFW, as appropriate) as a Designated Biologist (i.e., field contact representative). Designated Biologist qualifications are presented in Mitigation Measure 3.3-1: *Designated Biologist*. The Designated Biologist shall be employed for the period during which on-going construction and post-construction monitoring and reporting by an approved biologist is required. Each successive Designated Biologist shall be approved by the BLM's Authorized Officer. The Designated Biologist shall have the authority to ensure compliance with all measures set forth in the Biological Opinion and CESA Section 2081 take authorization and with all mitigation measures included herein, and will be the primary agency contact for the implementation of these measures. The Designated Biologist will have the authority and responsibility to halt any project activities that are in violation of the terms of the Biological Opinion, Section 2081 take authorization, or Project mitigation measures. A list of responsibilities of the Designated Biologist is summarized below. To avoid and minimize effects to biological resources, the Designated Biologist shall: 1. Notify the BLM's Authorized Officer and USFWS at least 14 calendar days before initiation of ground-disturbing activities. 2. Immediately notify the BLM's Authorized Officer in writing if the Applicant/Owner does not comply with any of the mitigation measures or terms of the Biological Opinion and/or the Section 2081 take authorization including, but not limited to, any actual or anticipated failure to implement such measures within the periods specified. 3. Conduct compliance inspections daily during on-going construction as clearing, grubbing, and grading are completed, and submit a monthly compliance report to BLM's Authorized Officer until construction is complete. **Mitigation Measure 3.4-1b: Biological Monitoring during Construction.** Biological Monitor(s) shall be employed to assist the Designated Biologist in conducting pre-construction surveys and monitoring ground disturbance, grading, construction, operation and maintenance, decommissioning, and restoration	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		activities. The Biological Monitor(s) shall have sufficient education and field experience to understand resident wildlife species biology, have experience conducting desert tortoise, burrowing owl, kit fox, and badger field monitoring, and be able to identify these species and their sign (including active burrows). The Designated Biologist shall submit a resume, at least three (3) references, and contact information for each prospective Biological Monitor to the BLM, and the Wildlife Agencies for approval. To avoid and minimize effects to biological resources, the Biological Monitor(s) will assist the Designated Biologist with the following: 1. Be present during construction activities that take place in suitable habitat for desert tortoise, burrowing owl, kit fox, badger, or other protected species to prevent or minimize harm or injury to these species. 2. Activities of the Biological Monitor(s) include, but are not limited to, ensuring compliance with all avoidance and minimization measures; monitoring for desert tortoise, burrowing owl, kit fox, badger, and other protected species; halting construction activity in the area if an individual is found; and checking the staking/flagging of all disturbance areas to be sure that they are intact and that all construction activities are being kept within the staked/flagged limits. If a desert tortoise, burrowing owl, kit fox, badger, or other protected species is found within a work area, the Biological Monitor(s) shall immediately notify the Designated Biologist, who shall determine measures to be taken to ensure that the individual is not harmed. 3. Inspect the Project area for any special-status wildlife species. 4. Ensure that potential habitats within the construction zone are not occupied by special-status species (e.g., potential burrows or nests are inspected). 5. In the event of the discovery of a non-listed, special-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat at least 200 feet from the limits of construction activities. 6. At the end of each work day, inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls will not be immediately backfilled following inspection, the Biological Monitor(s) will ensure that the construction crew slopes the ends of the excavation (3:1 slope) to provide wildlife escape ramps or will ensure that the construction crew completely and securely covers the excavation to prevent wildlife entry. 7. Inspect the site to help ensure trash and food-related waste is place in closed-lid containers and to ensure that workers do not feed wildlife. Also inspect the work area each day to ensure that no microtrash (e.g., bolts, screws, etc.) is left behind. **Mitigation Measure 3.4-1c: Worker Environmental Awareness Program (WEAP).** Prior to Project initiation, the Designated Biologist shall develop and implement the WEAP (APM 44), which shall be available in English and Spanish. Wallet-sized cards summarizing the information shall be provided to all construction and operation and maintenance personnel. The WEAP shall include the following: 1. An explanation of the sensitivity of the vegetation communities and special-status plant and wildlife species within and adjacent to work areas, and proper identification of these resources.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		2. Biology and status of the desert tortoise, golden eagle, burrowing owl, other nesting birds, kit fox, and American badger and measures to reduce potential effects to these species. 3. Actions and reporting procedures to be used if desert tortoise, burrowing owl, other nesting birds, kit fox, or American badger are encountered. 4. An explanation of the function of flagging that designates authorized work areas. 5. Driving procedures and techniques to reduce mortality of wildlife on roads. 6. Discussion of the federal and state Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act and the consequences of non-compliance with these acts. 7. The importance of avoiding the introduction of invasive weeds into the Project area and surrounding areas. 8. A discussion of general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures. 9. A review of mitigation requirements. **Mitigation Measure 3.4-1d: Speed Limits.** Speed limits along all access roads outside of permanent desert tortoise fencing shall not exceed 15 miles per hour to minimize dust during construction activities. Speed limits within permanent desert tortoise fencing shall not exceed 25 miles per hour to minimize impacts during operations and maintenance. Nighttime vehicle traffic associated with Project activities shall be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species. **Mitigation Measure 3.4-2a: Desert Tortoise Protection.** The Applicant/Owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS' 2009 Desert Tortoise Field Manual (USFWS, 2009d) or more current guidance provided by CDFW and USFWS. The Applicant/Owner shall also implement all terms and conditions described in the Biological Opinion to be prepared by USFWS. These measures include, but are not limited to, the following: 1. ***Desert Tortoise Fencing along I-15.*** If required by the USFWS, to avoid increases in vehicle-related mortality from disruption of local movement patterns along the existing ephemeral wash systems, desert tortoise-proof fencing shall be installed along the existing freeway right-of-way fencing on both sides of I-15 for the entire east-west dimension of the Project site. The tortoise fencing shall be designed to direct tortoises to existing undercrossing to provide safe passage under the freeway, and shall be regularly inspected and maintained for the life of the Project. 2. ***Desert Tortoise Exclusion Fence Installation.*** To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along road corridors during construction. The proposed alignments for the	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		permanent perimeter fence and temporary fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and temporary fencing areas shall be conducted by the Designated Biologist(s) using techniques outlined in the USFWS' 2009 Desert Tortoise Field Manual and may be conducted in any season with USFWS and CDFW approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100 percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line covering an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 Desert Tortoise Field Manual. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist in accordance with the USFWS' 2009 Desert Tortoise Field Manual (USFWS, 2009d). a. *Timing, Supervision of Fence Installation.* The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present. b. *Fence Material and Installation.* The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 Desert Tortoise Field Manual (Chapter 8 - Desert Tortoise Exclusion Fence). c. *Security Gates*. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry d. *Fence Inspections.* Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the Project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		3. ***Desert Tortoise Clearance Surveys within Solar Arrays.*** Clearance surveys shall be conducted in accordance with the USFWS Desert Tortoise Field Manual (USFWS, 2009d) (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the Project area by walking transects no more than 15 feet apart. If a desert tortoise is located during the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the plant site may only be conducted when tortoises are most active (April through May or September through October) unless the Project receives approval from CDFW and USFWS. Clearance surveys of linear features may be conducted during any time of the year. Any tortoise located during clearance surveys of solar arrays shall be translocated or relocated and monitored in accordance with the Desert Tortoise Translocation Plan (DTTP; Mitigation Measure 3.4-2b) a. *Burrow Searches.* During clearance surveys all desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS Desert Tortoise Field Manual (USFWS, 2009d). To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined in accordance with the DTTP. Tortoises taken from burrows shall be translocated as described in the DTTP. b. *Burrow Excavation/Handling.* All potential desert tortoise burrows located during clearance surveys shall be excavated by hand, tortoises removed, and burrows collapsed or blocked to prevent occupation by desert tortoises in accordance with the DTTP. All desert tortoise handling and removal and burrow excavations, including nests, shall be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS Desert Tortoise Field Manual (USFWS, 2009d). 4. ***Monitoring Following Clearing.*** Following the desert tortoise clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the Project site to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or Biological Monitor shall be on-site for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the DTTP. 5. ***Reporting.*** The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled tortoise. Desert tortoise moved from within Project areas shall be marked and monitored in accordance with the DTTP.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		**Mitigation Measure 3.4-2b: Desert Tortoise Translocation Plan.** The Applicant/Owner shall develop and implement a USFWS-approved Desert Tortoise Translocation Plan (DTTP). The DTTP shall include measures to minimize the potential for repeated translocations of individual desert tortoises. The goals of the DTTP shall be to: relocate all desert tortoises from the Project site to nearby suitable habitat; minimize impacts on resident desert tortoises outside the Project site; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring. The final DTTP shall be based on the draft Desert Tortoise Translocation Plan prepared by the Applicant/Owner (Panorama Environmental, Inc., 2013d) and shall include all revisions deemed necessary by BLM, USFWS, and CDFW. **Mitigation Measure 3.4-2d: Desert Tortoise Compensatory Mitigation:** To fully mitigate for habitat loss and potential take of desert tortoise, the Project owner shall provide compensatory mitigation consistent with federal requirements, adjusted to reflect the final Project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the proposed Project, including all Project linears, as well as undeveloped areas inside the Project's boundaries that will no longer provide viable long-term habitat for the desert tortoise. To satisfy this condition, the Project owner shall acquire, protect, and transfer 1 acre of desert tortoise habitat for every acre of habitat within the final Project footprint, and provide associated funding for the acquired lands, as specified below. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as provided below in section 3.i. of this measure. If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands include all of the following: 1. ***Selection Criteria for Compensation Lands.*** The compensation lands selected for acquisition in fee title or in easement shall: a. be within the Western Mojave Recovery Unit, as defined in the 2011 Revised Recovery Plan (USFWS, 2011a), with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands; b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed; c. be prioritized near larger blocks of lands that are either already protected or planned for protection, such as DWMAs within the Western Mojave Recovery Unit (or nearby portions of the Eastern Mojave Recovery Unit with prior USFWS approval) or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation; d. be connected to lands with desert tortoise habitat equal to or better quality than the Project site, ideally with populations that are stable, recovering, or likely to recover;	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible; f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and h. have water and mineral rights included as part of the acquisition, unless the BLM, in consultation with CDFW and USFWS, agrees in writing to the acceptability of the land. 2. ***Review and Approval of Compensation Lands Prior to Acquisition.*** The Project owner shall submit a formal acquisition proposal to the BLM, CDFW, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the BLM in consultation with CDFW and the USFWS shall be required for acquisition of all compensatory mitigation parcels. 3. ***Compensation Lands Acquisition Requirements.*** The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the BLM, in consultation with CDFW and USFWS, have approved the proposed compensation lands: a. *Preliminary Report.* The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the BLM, in consultation with CDFW and USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board. b. *Title/Conveyance.* The Project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the BLM. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or BLM under terms approved by the BLM. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFW in a form approved by CDFW. If an approved non-profit holds a conservation easement, CDFW shall be named a third party beneficiary. c. *Initial Habitat Improvement Fund.* The Project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		Government Code Section 65965) and if it meets the approval of CDFW and the BLM. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee. d. *Property Analysis Record.* Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands. e. *Long-term Maintenance and Management Fund.* The Project owner shall deposit in NFWF's REAT Account a capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands. f. The BLM, in consultation with CDFW, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision. g. *Interest, Principal, and Pooling of Funds.* The Project owner, BLM, and CDFW shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions: i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFW designed to protect or improve the habitat values of the compensation lands. ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFW or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFW takes fee title to the compensation lands, monies received by CDFW pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFW designates NFWF or another entity to manage the long-term maintenance and management fee for CDFW. iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFW, or a BLM- and CDFW-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFW.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-1 (cont.)		h. *Other expenses.* In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to: title and document review costs; expenses incurred from other state agency reviews; overhead related to providing compensation lands to CDFW or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures. i. *Mitigation Security.* The Project owner shall provide financial assurances to the BLM and CDFW with copies of the document(s) to the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the Project in the event the Project owner fails to comply with the requirements specified in this condition, or shall be returned to the Project owner upon successful compliance with the requirements in this condition. The BLM's or CDFW's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Financial assurance can be provided to the BLM and CDFW in the form of an irrevocable letter of credit, a pledged savings account, or another form of security ("Security"). Prior to submitting the Security to the BLM, the Project owner shall obtain the BLM's approval in consultation with CDFW and the USFWS of the form of the Security. The actual costs to comply with this condition will vary depending on the final footprint of the Project and the actual costs of acquiring, improving, and managing the compensation lands. i. NFWF REAT Account. The Project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the Project owner shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than anticipated in the PAR analysis, the excess money deposited in the REAT Account shall be returned to the Project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the Project owner. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the BLM and CDFW. Such delegation shall be subject to approval by the BLM and CDFW, in consultation with USFWS, prior to land acquisition, initial protection, or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of BLM's approval.	
Impact Wild-2: The Proposed Action would have substantial adverse indirect effects on Mojave fringe-toed lizard.	Significant	**Implement Mitigation Measures 3.4-1a, 3.4-1b, and 3.4-1c (above).**	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-3: The Proposed Action could have substantial adverse direct and indirect effects on special-status birds.	Significant and unavoidable	**Mitigation Measure 3.4-1f: Burrowing Owl Protection Measures.** No more than 30 days prior to the start of construction, a pre-construction survey for burrowing owls in conformance with the CDFW Staff Report on Burrowing Owl Mitigation (CDFG, 2012) shall be completed within suitable habitat at every work area and within a 150-meter buffer zone of each work area. The Applicant/Owner shall submit the results of the pre-construction survey to BLM's Authorized Officer and CDFW. The Applicant/Owner shall also submit evidence of conformance with federal and state regulations regarding the protection of the burrowing owl by demonstrating compliance with the following: 1. Unless otherwise authorized by BLM and CDFW, no disturbance shall occur within 160 feet (50 meters) of occupied burrows during the non-breeding season (September 1 through January 31) or within 650 feet (500 meters) during the breeding season (February 1 through August 31). 2. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31). In the event that an occupied burrow absolutely cannot be avoided (e.g., due to physical or safety constraints), passive relocation of owls may be implemented prior to construction activities only if a qualified biologist approved by BLM verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Eviction outside the nesting season may be permitted pending evaluation of eviction plans (developed in accordance with BLM protocol for burrowing owls) by CDFW and receipt of formal written approval from BLM authorizing the eviction. A Burrowing Owl Mitigation and Monitoring Plan shall be submitted to the BLM's Authorized Officer and CDFW for review and approval prior to passive relocation. 3. Unless otherwise authorized by BLM, a 650 foot buffer within which no activity will be permissible will be maintained between Project activities and nesting burrowing owls during the nesting season. This protected area will remain in effect until August 31 or at BLM's discretion and based upon monitoring evidence, until the young owls are foraging independently. 4. If accidental take (disturbance, injury, or death of owls) occurs, the Designated Biologist will be notified immediately. 5. Impacts to active burrowing owl territories shall be mitigated at a 1:1 ratio through a combination of off-site habitat compensation and/or off-site restoration of disturbed habitat capable of supporting this species. The acquisition of occupied habitat off-site shall be in an area where turbines would not pose a mortality risk. Acquisition of habitat shall be consistent with the CDFW's Staff Report on Burrowing Owl Mitigation (CDFG, 2012). The preserved habitat shall be occupied by burrowing owl and shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified ornithologist. The site shall be approved by BLM. Land shall be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. The off-site area to be preserved can coincide with off-site mitigation lands for permanent impacts to sensitive vegetation communities, with the approval of the BLM and CDFW.	Significant and unavoidable

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-3 (cont.)		**Mitigation Measure 3.4-1g:** Bird and Bat Conservation Strategy (BBCS). The Applicant/Owner shall develop a BBCS to address Project impacts to special-status avian and bat species. The Applicant/Owner shall submit the BBCS to the BLM and USFWS for review and approval prior to initiation of Project construction. A raven management element shall be included in the BBCS that includes measures such as storage of garbage in raven-proof containers and installation of anti-nesting devices on structures where raven nests could be built. **Mitigation Measure 3.4-1h: Avian Monitoring Program.** An Avian Monitoring Program shall be initiated and approved pre-construction and continue for at least three years following commercial operation (and longer if determined necessary and appropriate by the Compliance Project Manager (CPM) that shall include, at a minimum, the following provisions: 1. The Project owner will survey and monitor on-site and off-site avian use and behavior to document species composition on and offsite, compare onsite and off-site rates of avian and bat use, document changes in avian and bat use over time (pre and post construction), and evaluate the changes in annual abundance and distribution of birds in and near the facility. The Project owner will submit all data gathered onsite to the CPM as specified herein, or as requested by the CPM, and also will make consulting biologists available to answer CPM inquiries. 2. The Project owner will implement a statistically robust avian and bat mortality and injury monitoring program to identify the extent of potential avian or bat mortality or injury from collisions with facility structures, including: a) assessing levels of collision-related mortality and injury with PV panels, perimeter fences, gen-tie line poles or wires, and other project features and structures; b) documenting flight spatial patterns via radar that may be associated with collision-related mortality and injury, if any. 3. The Project owner will implement an adaptive management and decision-making framework for reviewing, characterizing, and responding to monitoring results. 4. The Project owner will identify specific conservation measures and/or programs to avoid, minimize, rectify, reduce, or eliminate avian injury or mortality over time and will evaluate the effectiveness of those measures. The Avian Monitoring Program shall include the following components: 1. A description and summary of the baseline survey methods, raw data, and results. 2. Full survey methodology and field documentation, identification of appropriate onsite and offsite survey locations, control sites, and the seasonal considerations. Bat acoustic sampling may be implemented depending on results of the Project owner's baseline studies, including preconstruction data. 3. Avian and bat mortality and injury monitoring that includes:		

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-3 (cont.)		a) Onsite monitoring that will systematically survey representative locations within the facility, at a level that will produce statistically robust data; account for potential spatial bias and allow for the extrapolation of survey results to non-surveyed areas and the survey interval based on scavenger and searcher efficiency trials and detection rates. b) Low-visibility and high-wind weather event monitoring to document potential weather-related collision risks that may be associated increased risk of avian or bat collisions with project features, including foggy, highly overcast, or rainy night-time weather typically associated with an advancing frontal system, and high wind events (40 miles per hour winds) are sustained for period of greater than 4 hours. The monitoring report shall include survey frequency, locations and methods. c) Statistically robust scavenger and searcher efficiency trials prior and post construction to document the extent to which avian or bat fatalities remain visible over time and can be detected within the project area and to adjust the survey timing and survey results to reflect scavenger and searcher efficiency rates. d) Statistical methods used to generate facility estimates of potential avian and bat impacts based on the observed number of detections during standardized searches during the monitoring season for which the cause of death can be determined and is determined to be facility-related. e) Field detection and mortality or injury identification, cause attribution, handling and reporting requirements. 4. All post-construction monitoring studies included in the Avian Monitoring Program shall be conducted by a third party contractor for at least three years following commercial operation and approval of the Avian Monitoring Program by the CPM. All surveys and monitoring studies included in the Avian Monitoring Program shall be conducted during construction and commercial operation. At the end of the three-year period, the CPM shall determine whether the survey program shall be continued. 5. An adaptive management program shall be developed to identify and implement reasonable and feasible measures that would reduce levels of avian or bat mortality or injury attributable to Project operations and facilities. 6. Monitor the death and injury of birds and bats from collisions with facility features. The monitoring data shall be used to inform an adaptive management program that would avoid and minimize Project-related avian and bat impacts. The study design shall be approved by the CPM in consultation with CDFW and USFWS. The Avian Monitoring Program shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The program also shall include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias. **Mitigation Measure 3.4-4: Avoid Disturbance to Nesting Birds.** Vegetation clearing shall take place outside of the general avian breeding season (February 15 to September 1), when feasible. If vegetation clearing cannot occur outside the avian breeding season, the Designated Biologist/Biological Monitor(s) shall conduct a preconstruction survey for nesting birds no more than three (3) days prior to vegetation	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-3 (cont.)		clearing. If no active nests are found, clearing can proceed. If active nests are found, no clearing shall be allowed within 150 feet (for passerines) to 250 feet (for raptors) of the active nests until the Designated Biologist determines the nest is no longer active or the nest fails. The Designated Biologist/Biological Monitor(s) shall submit the results of the pre-construction nesting bird surveys to the BLM, USFWS, and CDFW. **Implement Mitigation Measures 3.4-1a, 3.4-1b, and 3.4-1c (above).**	
Impact Wild-4: The Proposed Action would have substantial adverse direct and indirect effects on desert kit fox and American badger.	Significant	**Implement Mitigation Measures 3.4-1a, 3.4-1b, and 3.4-1c (above).**	Less than significant
Impact Wild-5: The Proposed Action would have a substantial adverse effect on bighorn sheep.	Significant and unavoidable	**Mitigation Measure 3.4-3: Bighorn Sheep Habitat Connectivity.** In addition to APM 75, which will provide two water sources to improve bighorn sheep habitat connectivity, this measure provides additional detail and requirements for the proposed water sources. To compensate for impacts to bighorn sheep habitat connectivity, the Applicant/Owner shall support CDFW's efforts to encourage connectivity of bighorn sheep populations between the south Soda Mountains, the north Soda Mountains, and the Avawatz Mountains, which are located further to the north of the Project site. More specifically, the Applicant/Owner shall provide funding for CDFW to install between three and five (total) pre-fabricated bighorn sheep water guzzlers in the north Soda Mountains/Avawatz Mountains corridor and provide funding to refill them through the life of the project. The Project owner shall consult with BLM and with the CDFW Desert Bighorn Sheep Program Coordinator to identify strategic locations for water sources to promote bighorn sheep migration through the north Soda Mountain range. Water sources will be situated in locations that: 1) facilitate use of existing 1-15 crossing sites at culverts and bridges; 2) are situated at key locations within the movement corridor; 3) are accessible using existing roads whenever possible for filling and maintenance; and 4) are situated outside of existing wilderness boundaries. The Project owner shall monitor and manage the artificial or restored water source for the benefit of bighorn sheep for the life of the Project, or shall provide sufficient funding to support such monitoring and management by an approved third party. At the end of the Project, CDFW shall have the option to retain and manage the water sources or have them removed by the Applicant/Owner during the decommissioning process.	Significant and unavoidable
Impact Wild-6: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on bighorn sheep.	Significant and unavoidable	None feasible.	Significant and unavoidable
Impact Wild-7: The Proposed Action would have a substantial adverse effect on special-status bats.	Significant	**Mitigation Measure 3.4-1e: Lighting Specifications to Minimize Bird and Bat Impacts.** The Applicant/Owner shall minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky. As a component of the lighting plan required in Mitigation Measure 3.18-1, all exterior lighting at operation and maintenance facilities, substations, and appurtenant structures shall be of the lowest illumination required for security and human safety. The Applicant/Owner shall install and continuously use and maintain lights with motion or heat sensors and switches to keep lights off when not required. Light fixtures	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Biological Resources – Wildlife (cont.)			
Impact Wild-7 (cont.)		shall be fully shielded and directed downward to minimize illumination above the horizontal plane. The Applicant/Owner shall minimize use of high-intensity lighting and steady-burning or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights. **Implement Mitigation Measures 3.4-1a, 3.4-1b, and 3.4-1c, 3.4-1g, and 3.4-1h (above).**	
Impact Wild-8: Project operation and maintenance-related interference with the movement of migratory birds though existing migratory corridors.	Less than significant	None required.	Less than significant
Impact Wild-9: The Proposed Action would interfere with the movement of bighorn sheep through existing migratory corridors.	Significant and unavoidable	**Implement Mitigation Measure 3.4-3 (above).**	Significant and unavoidable
Climate Change			
Impact GHG-1: The Proposed Action would generate direct and indirect GHG emissions.	Less than significant	None required.	Less than significant
Cultural Resources			
Impact Cul-1: The Project could result in a substantial adverse change in the significance of a historical or archaeological resource.	Significant	**Mitigation Measure 3.6-1:** Prior to earth moving activities, the Applicant shall retain a qualified archaeologist, defined as one meeting the Secretary of the Interior's qualifications standards for archaeology and subject to approval by the BLM, to conduct cultural resources sensitivity training for all construction personnel. Construction personnel shall be informed of the types of cultural resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources. The applicant shall ensure that construction personnel are made available for and attend the training and shall retain documentation demonstrating attendance. **Mitigation Measure 3.6-2:** A Cultural Resources Discovery and Monitoring Plan (CRDMP) shall be developed and implemented by an archaeologist who meets the Secretary of the Interior's Standards. The CRDMP shall detail provisions for the archaeological monitoring of Project construction. Archaeological monitoring during ground-disturbing activities shall be conducted by an archaeologist familiar with the types of historic and prehistoric resources that could be encountered within the APE, who shall have the authority to halt construction in the event of a discovery. The archaeological monitor shall work under the direct supervision of the qualified archaeologist. All cultural resources personnel will be approved by the BLM. The CRDMP shall detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, and assessing National Register- and California Register-eligibility in the event that unknown cultural resources are discovered during construction. The CRDMP shall require that the contractor immediately cease all work activities in the area (within 100 feet) of the discovery until it can be evaluated by a qualified archaeologist. After cessation of excavation, the contractor shall immediately contact the BLM Archaeologist. The contractor shall not resume work until authorization from the BLM is received.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Cultural Resources (cont.)			
Impact Cul-1 (cont.)		If the qualified archaeologist, in consultation with BLM, determines that the discovery constitutes a historic property per Section 106 of the National Historic Preservation Act or a historical or unique archaeological resource under the California Environmental Quality Act, preservation in place shall be the preferred manner of mitigation. In the event preservation in place is demonstrated to be infeasible, a treatment plan shall be prepared by the qualified archaeologist and shall be approved by the BLM prior to implementation. BLM shall consult with appropriate Native American representatives in determining appropriate treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. Archaeological materials recovered during any investigation shall be curated at an accredited curational facility. The CRDMP shall include provisions for reporting of monitoring and any treatment of resources in a timely manner.	
Impact Cul-2: The inadvertent discovery of human remains could result in their disturbance.	Significant	**Mitigation Measure 3.6-3:** If human remains are discovered during construction, all work shall be diverted from the area of the discovery and the BLM authorized officer shall be informed immediately. the BLM shall ensure that any Native American human remains, funerary objects, sacred objects, and/or objects of cultural patrimony discovered on BLM administered lands during implementation of the Project will be treated in accordance with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) (Pub. L. 101-601) and 43 CFR Section 10. Avoidance and protection of inadvertent discoveries that contain human remains through Project redesign shall be the preferred protection strategy.	Less than significant
Geology and Soil Resources			
Impact Geo-1: Construction, operation, and maintenance of the Project could expose people or structures to potential substantial adverse effects involving strong seismic ground shaking and/or seismic-related ground failure.	Significant	**Mitigation Measure 3.7-2:** Soils and Geotechnical Investigation. Prior to construction of Project facilities, a qualified California-licensed geotechnical engineer shall prepare and submit to BLM a final geotechnical investigation that provides design requirements for foundations, retaining walls/shoring, and excavation. The scope of the geotechnical report shall include the solar array fields, collection line routes, substation and switchyard site, and the operation and maintenance buildings sites. The geotechnical investigation shall expand upon the preliminary investigations as necessary and identify and evaluate the presence of expansive, compressible, liquefiable, or mechanically unstable soils and, if present, shall make recommendations for site preparation or design necessary to avoid or reduce adverse structural impacts. Structural foundations shall not be founded on engineered fill, nor on native soil, unless it is demonstrated that the soils would be adequate to support the foundation. A California-licensed geotechnical engineer shall be retained by the Applicant to be present on the Project site during excavation, grading, and general site preparation activities to monitor the implementation of the recommendations specified in the geotechnical investigation. When/if needed, the geotechnical engineer shall provide structure-specific geologic and geotechnical recommendations that shall be documented in a report approved by the permitting agency.	Less than significant
Impact Geo-2: The Project would result in substantial soil erosion or the loss of topsoil.	Significant	**Mitigation Measure 3.7-1:** Soil Erosion Control Plan Review and Approval. The Project SWPPP or BMP Plan shall be reviewed and approved by a BLM watershed specialist, hydrologist, and/or engineer before implementation. Erosion control and drainage plans for new and existing roads to be utilized for the Project shall be aimed at maintaining to the greatest extent feasible existing soil quality and integrity. In developing the Plan, the Applicant or its contractor shall consult with the BLM to determine the appropriate soil quality objective(s) to be met following construction (for temporary construction disturbances) and following	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Geology and Soil Resources (cont.)			
Impact Geo-2 (cont.)		decommissioning (for total site restoration). As part of the erosion control and drainage plans, the Applicant and/or its contractor shall implement an appropriate combination of BMPs in order to meet or exceed the applicable soil quality objective(s) (e.g., maintain or enhance soil quality and function). All measures and facilities for controlling runoff and erosion shall be in place prior to ground disturbing activities. Desert tortoise fencing shall be installed with minimum impact to existing washes and in such a manner as to limit the increase of sediment. Any desert tortoise fencing that creates spoil piles or excess soil shall have straw wattles or other measures installed to prevent soil transport. All erosion control facilities shall be monitored immediately following a significant rainfall event. A major rainfall event is defined as one for which flow is visibly detectable within the fenced drainage. All repairs shall be completed prior to the commencement of ground disturbing activity. Any erosion control facilities that are damaged by rainfall shall be repaired within 24 hours of any damage and shall be monitored after any precipitation. Clearance reports and inspection logs shall be submitted to the BLM and the County for approval. Any damage to erosion control facilities shall be reported to the BLM and the County and per the above, no ground disturbing activity shall restart until the facilities are repaired. **Mitigation Measure 3.7-4:** Protection of Desert Pavement. Grading and other methods of ground disturbance in areas covered by desert pavement shall be avoided or minimized. If avoidance of these areas is not possible, the desert pavement surface shall be protected from damage or disturbance from construction vehicles by use of temporary mats on the surface. A plan for identification and avoidance or protection of sensitive desert pavement shall be prepared and submitted to the BLM for review and approval at least 60 days prior to start of construction.	
Impact Geo-3: The Project may be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site soil subsidence and hydrocompaction.	Significant	**Implement Mitigation Measure 3.7-2 (above).**	Less than significant
Impact Geo-4: The Project may be located on expansive soil, creating substantial risks to life or property.	Significant	**Implement Mitigation Measure 3.7-2 (above).**	Less than significant
Impact Geo-5: The Project may be located on soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems.	Significant	**Mitigation Measure 3.7-3:** Septic Site Feasibility Tests. Standard in-situ testing (deep percolation tests) would be performed at locations where septic or alternative wastewater disposal systems are proposed. The Applicant shall document that any proposed sites for septic or alternative wastewater disposal systems meet all applicable standards, and that documentation shall be made available to BLM.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Hazards and Hazardous Materials			
Impact Haz-1: The Proposed Action would involve the routine transport, use, or disposal of hazardous materials, which could create a hazard to the public or the environment through accidents and spills.	Less than significant	None required.	Less than significant
Impact Haz-2: The Proposed Action would require the use of hazardous materials, which could result in a significant hazard to the public or the environment if released into the environment.	Less than significant	None required.	Less than significant
Lands and Realty			
No Impact			
Mineral Resources			
No Impact			
Noise			
Impact Noise-1: Construction and decommissioning of the Proposed Action could expose persons to nighttime noise levels in excess of San Bernardino County noise standards.	Significant	**Mitigation Measure 3.11-1:** Construction and decommissioning activities associated with the operation and maintenance buildings, pile driving within 1.5 miles of residences, and the Rasor Road reroute within 1 mile of residences shall not occur between the hours of 10:00 p.m. and 7 a.m., Monday through Saturday, or at any time on Sundays.	Less than significant
Impact Noise-2: Construction and decommissioning of the Proposed Action would increase ambient noise levels.	Significant	**Implement Mitigation Measure 3.11-1 (above).**	Less than significant
Paleontological Resources			
Impact Paleo-1: The Project could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance.	Significant	**Mitigation Measure 3.12-1:** Prior to construction, design plans shall be compared with geotechnical data and foundation design requirements compiled under Mitigation Measure 3.7-2 to determine whether the subsurface geology has a higher paleontological sensitivity than the surface geology, and whether construction will disturb the underlying higher sensitivity geologic units. If disturbance will occur, then monitoring of construction excavations in the disturbance areas shall take place in order to reduce potential adverse effects on significant paleontological resources.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Paleontological Resources			
Impact Paleo-1 (cont.)		**Mitigation Measure 3.12-2:** Prior to construction, a training session on the recognition of the types of paleontological resources that could be encountered within the requested ROW boundary and the procedures to be followed if they are found shall be presented to Project personnel by a qualified and BLM-permitted professional paleontologist. **Mitigation Measure 3.12-3:** Based on the results of the field survey (PaleoResource Consultants, 2009) and in accordance with the BLM's paleontological resource management policies, monitoring shall take place in all areas where excavations that disturb older alluvium will occur during any Project phase. The monitoring program shall be designed and implemented by a qualified and BLM-permitted professional paleontologist. All scientifically significant fossils salvaged during construction monitoring shall be prepared to the point of curation, identified to element and the lowest possible taxonomic level, and transferred to the San Bernardino County Museum for permanent storage. The results of the paleontological monitoring program, including an itemized inventory of salvaged fossils, shall be detailed in a Final Paleontological Monitoring Report prepared according to BLM policy (BLM, 1998, 2008). **Mitigation Measure 3.12-4:** If any potential fossils are discovered during construction, operation and/or maintenance activities, or during decommissioning, the fossils shall be left undisturbed, and the BLM Authorized Officer shall be notified immediately.	
Recreation			
Impact Rec-1: The Proposed Action would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities.	Less than significant	None required.	Less than significant
Impact Rec-2: Project-related realignment of Rasor Road to maintain OHV access would require construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	Less than significant	None required.	Less than significant
Socioeconomics and Environmental Justice			
Impact Socio-1: The Proposed Action would not induce substantial population growth through the extension of infrastructure.	Less than significant	None required.	Less than significant
Special Designations			
Special designations are uniquely federal concerns. No CEQA significance thresholds apply.			

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Transportation and Travel Management			
Impact Trans-1: The Proposed Action would not conflict with the established measure of effectiveness (LOS) for the performance of I-15.	Less than significant	None required.	Less than significant
Impact Trans-2: The Proposed Action would not conflict with the SANBAG CMP.	Less than significant	None required.	Less than significant
Impact Trans-3: The Proposed Action would not substantially increase hazards due to a design feature or incompatible use.	Less than significant	None required.	Less than significant
Impact Trans-4: The Proposed Action would not result in inadequate emergency access to the Project site.	Less than significant	None required.	Less than significant
Utilities and Public Services			
Impact Util-1: The Proposed Action could exceed the wastewater treatment requirements of the Lahontan Regional Water Quality Control Board.	Significant	**Implement Mitigation Measure 3.7-3 (above).**	Less than significant
Impact Util-2: The Proposed Action would require and result in the construction of new stormwater drainage facilities, the construction of which could cause environmental effects.	Significant	**Mitigation Measure 3.19-2: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan.** The Applicant shall prepare a Comprehensive Drainage, Stormwater, and Sedimentation Plan (Plan) prior to the initiation of construction (or decommissioning as relevant). Detailed hydrologic analysis will be performed prior to final design of the Project. Results of these analyses will be submitted to the BLM and County for review. All proposed grading and impervious surfaces on site shall be reviewed and approved by the BLM and County, with respect to its potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation. The Plan shall include, but not be limited to, the following measures: 1. All boulders and cobbles removed from construction access corridors and temporary access roads shall be stockpiled adjacent to the construction access corridors and temporary access roads. At the completion of construction, these boulders and cobbles shall be distributed on the surface of the construction access corridors and temporary access roads to help protect the exposed fine grained materials. 2. Construction of construction access corridors and temporary and permanent access roads shall not block existing drainage channels and shall not significantly alter the existing topography. 3. The Applicant shall delineate the active drainage channels within each drainage avoidance area, and avoid placement of proposed flood protection berms within active drainage channels. The drainage avoidance areas shall protect no less than 90 percent of the area of the active drainage channels from construction impacts.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Utilities and Public Services (cont.)			
Impact Util-2 (cont.)		4. The Applicant shall prepare hydraulic analyses that estimate the pre- and post-development peak discharges, water depths, and velocities for both smaller, more frequent events (2-, 5-, and 10-year events), as well as larger design storm events (100-year event) that would flow through each solar array field, drainage avoidance area, and/or on either side of each proposed flood protection berm. If hydraulic analyses indicate that flow depths and/or velocities may potentially be substantially altered for smaller, more frequent events, sediment transport analyses shall be performed to estimate changes in sediment transport from the South Array. Sediment transport from the South Array shall not significantly decrease as a result of the proposed project. 5. The Applicant shall provide the BLM and County design details for the flood protection berms including subgrade preparation, construction methods, and armoring or scour protection if needed (both along the drainage avoidance areas and on the array side of the berm). The Applicant shall provide the BLM and County design details for Habitat Protection Fencing including how stormwater flows and debris will pass through the fencing. **Mitigation Measure 3.19-4: Groundwater Testing.** A ground water testing plan shall be submitted to the BLM and the County within two weeks (14 days) after the issuance of a Notice to Proceed. The testing plan shall provide for the construction of one production/test well in the South Array field as shown in the Applicant's Plan of Development. The testing for this well shall include the construction of two observation wells to be tentatively located as shown on Draft PA/EIS/EIR Figure 3.19-9. The exact location of the observation wells shall be determined by a professional hydrogeologist in consultation with the BLM and the County. The well test shall run for 72 hours or as determined by the BLM and the County. All necessary permits for the well test shall be obtained from the Regional Water Quality Control Board, prior to initiation of the well test. The results of the well test, specifically the level of draw down within the observation wells, shall be provided to the BLM and the County within five (5) days of the completion of the test. If the results of the test indicate a significant drawdown in the aquifer that may affect the Mohave tui chub, water usage will be curtailed to a level that will not cause draw down in the aquifer and supplemental water for dust suppression shall be provided by other means, such as hauling water from an off-site source. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels in the observation wells, consistent with Draft PA/EIS/EIR Figure 3.19-9. The groundwater monitoring plan would also include monitoring and quarterly reporting of groundwater elevations in Soda Spring and Lake Tuendae. If the Project is shown to cause a significant decline in groundwater levels which could threaten the tui chub, an evaluation will be conducted to determine the cause and the ground water model revised.	
Impact Util-3: There would be sufficient water supplies available to serve the Proposed Action from existing entitlements and resources.	Less than significant	None required.	Less than significant
Impact Util-4: The Proposed Action would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs.	Less than significant	None required.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Visual Resources			
Impact Vis-1: The Project would have an adverse impact on a scenic vista.	Significant	**Mitigation Measure 3.18-2: Construction.** A pre-construction meeting with BLM landscape architects or other designated visual/scenic resource specialists shall be held before construction begins to coordinate on the VRM mitigation strategy and confirm the compliance checking schedule and procedures. Final design and construction documents will be reviewed for completeness with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The construction documents shall include, but not be limited to grading, drainage, revegetation, vegetation clearing, and feathering plans, and must demonstrate how VRM objectives will be met, monitored, and measured for conformance. 1. The Applicant shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving existing, native vegetation to the extent feasible; utilizing undulating surface-disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation. 2. Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin. 3. Existing rocks, vegetation, and drainage patterns shall be preserved to the extent feasible. 4. Brush-beating or mowing or using protective surface matting rather than removing vegetation shall be employed where feasible. 5. Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas. 6. The visual color contrast of graveled surfaces shall be reduced with approved color treatment practices. 7. No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate surveyor construction activity limits. 8. All stakes and flagging shall be removed from the construction area and disposed of in an approved facility. **Mitigation Measure 3.18-3: Operation and Maintenance.** Terms and conditions for VRM mitigation compliance should be maintained and monitored for compliance with visual objectives, adaptive management adjustments, and modifications as necessary and approved by the BLM landscape architect or other designated visual/scenic resource specialist. Minimum measures are as follows: 1. The Applicant shall maintain revegetated surfaces until a self sustaining stand of vegetation is re-established and visually adapted to the undisturbed surrounding vegetation. No new disturbance shall be created during operation without completion of a VRM analysis and approval by the AO. 2. Interim restoration shall be undertaken during the operating life of the Project as soon as possible after disturbances. 3. Painted facilities shall be kept in good repair and repainted when color fades or flakes.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Visual Resources (cont.)			
Impact Vis-1 (cont.)		4. Color-treated solar panel backs/supports shall be kept in good repair, and retreated when color fades and/or flakes. **Mitigation Measure 3.18-4: Decommissioning and Site Reclamation.** A Decommissioning and Site Reclamation Plan, covering visual impact mitigation measures, shall be in place prior to construction, and reclamation activities should be undertaken as soon as possible after disturbances occur and be maintained throughout the life of the Project. The following decommissioning/reclamation activities/practices shall be implemented to partially mitigate visual impacts associated with solar energy development, where feasible: 1. Pre-development visual conditions, and the B-Quality scenery (BLM, 2010a) and integrity shall be reviewed, and the visual elements of form, line, color, and texture shall be restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the better visual quality and most ecologically sound outcome. 2. A Decommissioning and Site Reclamation Plan shall be developed, approved by the BLM, and implemented. The plan shall require that all aboveground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the Project's visual mitigation and reclamation objectives. 3. Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscapes. The Applicant shall contour to a rough texture (i.e., use large rocks/boulders, grade uneven surfaces, and/or vegetation mulches/debris) in order to trap seed and to discourage off-road travel, thereby reducing associated visual impacts. 4. A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of decommissioning activities enabling direct transplanting shall be utilized. Where feasible, native vegetation shall be used for revegetating to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape. 5. Stockpiled topsoil shall be reapplied to disturbed areas, and the areas shall be revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where applicable, or by using a mix of native and non-native species if necessary to ensure successful revegetation. Gravel and other surface treatments shall be removed or buried. 6. Rocks, brush, and vegetal debris shall be restored whenever possible to approximate preexisting visual conditions. 7. Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes. 8. A decommissioning VRM Monitoring and Compliance Plan shall be prepared by the Applicant and approved by the BLM that establishes the schedule and terms for monitoring and the conditions and methods of measurement for determining compliance.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Visual Resources (cont.)			
Impact Vis-2: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on a scenic vista.	Significant and unavoidable	None feasible.	Significant and unavoidable
Impact Vis-3: The Project would degrade the existing visual character or quality of the site and its surroundings.	Significant	**Implement Mitigation Measures 3.18-2, 3.18-3, and 3.18-4 (above).**	Less than significant
Impact Vis-4: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on the existing visual character or quality of the site and its surroundings.	Significant and unavoidable	None feasible.	Significant and unavoidable
Impact Vis-5: The Project would create a new source of light and glare that could adversely affect views in the area.	Significant	**Mitigation Measure 3.18-1: Siting and Design.** Visual design elements shall be integrated into the construction plans, details, shop drawings and specifications; these shall include, but not be limited to, grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural plans. Visual design elements within the plans shall be measureable and monitored while under construction, while operational, and when decommissioned. The plans shall include a Glint and Glare Assessment, Mitigation, and Monitoring plan that accurately assesses and quantifies potential glint and glare effects and determines the potential health, safety, and visual impacts associated with glint and glare. The assessment shall be conducted by qualified individuals using appropriate software and procedures. The assessment results shall be made available to the BLM in advance of Project approval. (BLM, 2013b) A careful study of the site shall be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered as well as seasons of peak visitor use (September 15 to April 15). Visual design elements to be integrated into construction plans, details, shop drawings and specifications must at a minimum include: 1. *Locate or screen solar collectors to avoid off-site glare* - Where significant off-site glare is unavoidable, employ materials to reduce the effect such as fencing with privacy slats, earthen berms, or vegetative screening, 2. *Vary the grid layout to reduce contrast caused by long straight roads* - Employ an off-set in the grid layout to reduce visual contrast caused by long straight roads and, to the extent possible, arrays. The result shall be that no road extends from one side of the solar field to the other in a straight line. To further reduce contrast caused by exposing un-oxidized soils and rock in roadways, at select locations of concern from KOPs, spot applications of a product such as Permeon shall be used to dull and darken the ground plane in a short time.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Visual Resources (cont.)			
Impact Vis-5 (cont.)		3. *Minimize project footprint and associated disturbance* - Perimeter clearing for a patrol road (typically 20 feet) inside and outside of the Project fenceline shall be minimized (maximum 16 feet) with consideration of the local fire regime. Vegetation shall not be fully cleared but cut to 6-inch height to retain texture over the ground plane. 4. *Color treat structures to reduce contrasts with the existing landscape* - In order to ensure the implementation of APM 42 and supplement its requirements to address adverse impacts, the Applicant shall color treat all operation and maintenance facilities, rear surfaces of the collectors, frames, tracker structures, PCS, and water tank facilities using a BLM standard environmental color that is identified through a site study for color and texture selection and approved by the BLM. Grouped structures shall be treated with the same color. Further: a. Security fencing shall be coated with black poly-vinyl or other visual contrast reducing color. b. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible. c. Materials, coating, or paints having little or no specular or reflective qualities shall be used on structures including, but not limited to, buildings, tanks, fences, fence railings, poles, aboveground pipes and culverts, and reverse sides of signs and guardrails. Substation equipment shall be specified with a low-reflectivity neutral finish. Insulators at substations and on takeoff equipment shall be non-reflective and non-refractive. The surfaces of substation structures shall be given low-reflectivity finishes with neutral colors that contrast minimally with the surrounding landscape. Chain-link fences are to have a dulled, darkened finish to reduce contrast. 5. *Lighting* - In order to ensure the implementation of APM 43 and supplement its requirements to address adverse impacts, all permanent lighting, except as required to meet minimum safety and security requirements, shall use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the light source), and must meet the Illuminating Engineering Society (IES) glare requirement limiting intensity of light from the luminaire in the region between 80 and 90 degrees from the ground. All fixtures must be mounted properly, at the proper angle. Further: a. Construction and permanent lighting – Except as required to meet safety and security requirements, lighting shall be minimized during construction and operation. Lighting shall be mounted and directed to focus light only on the intended area, and to avoid light spill and off-site light trespass. Lights pointing upward or horizontal are to be avoided. During construction, localized and portable lighting shall be used where and when the work is occurring. Lighting is to be powered by generators and have switches to cut power when lighting is not required by construction. b. Facility lighting – Lighting for facilities shall not exceed the minimum number, intensity, and coverage required for safety and basic security. Lighting shall be amber in color when accurate color rendition is not required. Use low-pressure sodium lamps or yellow LED lighting, or equivalent. No bluish-white lighting shall be used in permanent outdoor lighting.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Visual Resources (cont.)			
Impact Vis-5 (cont.)		c. Area lighting – All area lighting shall be divided into separately controlled zones to focus lighting on smaller areas where tasks are being performed and to avoid illuminating unused space. Area lighting is to be controlled by timers, sensors, or switches available to facility operators. The facility operators are to identify those components/structures that do not require continuous lighting for safety reasons. Area lights are only to be switched on when there is a specific need (e.g., cleaning panels at a solar facility, persons occupying an area, or alarm situation). d. Lighting plan – A lighting plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operation. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security, and shall not cause excessive reflected glare. Low-pressure sodium light sources shall be used to reduce light pollution. Full cut-off luminaires shall be used to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the Project boundary. Lights in highly illuminated areas that are not occupied on a continuous basis shall be equipped with switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The lighting plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts. 6. Vegetation and ground disturbance associated with access road construction, and distribution line installations shall be minimized and take advantage of existing clearings wherever feasible. 7. Along all off-site access roads, all off-site distribution line corridors, and all internal access roads 16 feet or wider, graveled surfaces, areas to be permanently cleared of vegetation, and (if applicable) cut slopes shall be treated with rock stains or other color treatment appropriate with the surrounding landscape. 8. Openings in vegetation for facilities, structures, and roads shall be feathered and shaped to repeat the size, shape, and characteristics of naturally occurring openings. 9. The distribution line shall utilize nonspecular conductors and nonreflective coatings on insulators.	
Impact Vis-6: Project-specific sources of light and glare would cause a cumulatively considerable contribution to significant adverse cumulative impacts relating to views, including views of the night sky, in the area.	Significant and unavoidable	None feasible.	Significant and unavoidable

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Water Resources			
Impact Water-1: The Proposed Action could violate water quality standards and/or waste discharge requirements by discharging sediment or other pollutants into waterways due to increased erosion, accidental releases of RO reject water, leaching of treated wastewater, and accidental spills of fuels, oils, or other pollutants.	Significant	**Mitigation Measure 3.19-1: Brine Pond Design.** The proposed brine ponds used for evaporation of reverse osmosis reject water shall include berms or levees that reach at least 2 feet above the highest anticipated flood flows during a 100-year storm event, or at least 2 feet above the highest adjacent ground, whichever is greater, in order to protect the brine ponds from incident flooding events and ensure that the ponds are not inundated by flood flows.	Less than significant
Impact Water-2: The Proposed Action would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.	Significant	**Mitigation Measure 3.19-3: Groundwater Monitoring and Mitigation Plan.** A Groundwater Monitoring and Mitigation Plan (Plan) shall be prepared, reviewed, and approved by San Bernardino County prior to Project approval and implementation. The County must approve the Plan prior to issuance of a groundwater well permit. The Plan shall conform to the guidelines for groundwater monitoring as detailed by San Bernardino County in the "Guidelines for Preparation of a Groundwater Monitoring Plan" (Guidelines) (San Bernardino County, 2000). The Plan shall be prepared by a qualified professional geologist, hydrogeologist, or civil engineer registered in the State of California and submitted by the Applicant to the County and the BLM for approval. This Plan shall provide detailed methodology for monitoring and reporting procedures; locate monitoring, extraction and survey points; define significance criteria; and identify mitigation measures in the event that adverse impacts occur that can be attributed to the Project. The Plan shall include summarization of all monitoring data and would require submission of annual reports to the County. A comprehensive summary and analysis of data shall be included in a 5-year report. Monitoring shall be performed during pre-construction, construction, and operation of the Project, with the intent to establish pre-construction and Project-related groundwater level trends that can be quantitatively compared against observed and simulated trends near the Project pumping wells and near potentially affected existing private wells and sensitive water resources, such as Soda Spring at Zzyzx. The County will determine the duration of monitoring and reporting periods based on project conditions and monitoring data. Additionally, at each stage of reporting, the Applicant would be required to re-evaluate of the adequacy of the monitoring network and Plan. The Plan shall include a schedule consistent with the Guidelines for submittal of data reports by the Applicant to the County and the BLM, for the duration of the monitoring period. These data reports shall be prepared and submitted to the County and the BLM for review and approval, and shall include water level monitoring data (trend analyses) from all pumping and monitoring wells. Annual data reports shall be prepared and submitted to the County and the BLM for review and approval. The annual reports must be prepared consistent with County Guidelines and contain all necessary information and data summaries. The fifth annual report must be submitted to the County in the form of a revised Hydrogeology Report. Along with the components of the annual reports, the 5-year report shall include a re-evaluation of the hydrology of the project area based upon the monitoring data and any other information available. The 5-year report shall be prepared consistent with approved county Guidelines and submitted to the County and the BLM for review and approval.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Water Resources (cont.)			
Impact Water-2 (cont.)		The County and the BLM shall determine whether operating groundwater supply wells or other water resources, such as Soda Spring, surrounding the Project site are influenced by Project activities. The Plan shall describe additional mitigation measures that may be implemented if the County and the BLM determine that additional mitigation is required. Such additional measures could include curtailing or, if necessary, ceasing withdrawal of groundwater and importing a corresponding amount of water from outside of the Soda Mountain Valley, and shall be implemented as agreed upon in the Plan and with the concurrence of the County and the BLM. After the first 5 years of the Project, the Applicant and the County and the BLM shall jointly evaluate the effectiveness of the Groundwater Monitoring and Mitigation Plan and determine if monitoring frequencies or procedures should be revised or eliminated.	
Impact Water-3: The Proposed Action could substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or flooding on- or off-site; and could create runoff that would exceed the capacity of existing stormwater drainage systems.	Significant	**Mitigation Measure 3.19-2: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan.** The Applicant shall prepare a Comprehensive Drainage, Stormwater, and Sedimentation Plan (Plan) prior to the initiation of construction (or decommissioning as relevant). Detailed hydrologic analysis will be performed prior to final design of the Project. Results of these analyses will be submitted to the BLM and County for review. All proposed grading and impervious surfaces on site shall be reviewed and approved by the BLM and County, with respect to its potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation. The Plan shall include, but not be limited to, the following measures: 1. All boulders and cobbles removed from construction access corridors and temporary access roads shall be stockpiled adjacent to the construction access corridors and temporary access roads. At the completion of construction, these boulders and cobbles shall be distributed on the surface of the construction access corridors and temporary access roads to help protect the exposed fine grained materials. 2. Construction of construction access corridors and temporary and permanent access roads shall not block existing drainage channels and shall not significantly alter the existing topography. 3. The Applicant shall delineate the active drainage channels within each drainage avoidance area, and avoid placement of proposed flood protection berms within active drainage channels. The drainage avoidance areas shall protect no less than 90 percent of the area of the active drainage channels from construction impacts. 4. The Applicant shall prepare hydraulic analyses that estimate the pre- and post-development peak discharges, water depths, and velocities for both smaller, more frequent events (2-, 5-, and 10-year events), as well as larger design storm events (100-year event) that would flow through each solar array field, drainage avoidance area, and/or on either side of each proposed flood protection berm. If hydraulic analyses indicate that flow depths and/or velocities may potentially be substantially altered for smaller, more frequent events, sediment transport analyses shall be performed to estimate changes in sediment transport from the South Array. Sediment transport from the South Array shall not significantly decrease as a result of the proposed project.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Water Resources (cont.)			
Impact Water-3 (cont.)		5. The Applicant shall provide the BLM and County design details for the flood protection berms including subgrade preparation, construction methods, and armoring or scour protection if needed (both along the drainage avoidance areas and on the array side of the berm). 6. The Applicant shall provide the BLM and County design details for Habitat Protection Fencing including how stormwater flows and debris will pass through the fencing.	
Impact Water-4: The Proposed Action would not place within a 100-year flood hazard area structures that would impede or redirect flood flows.	Less than significant	None required.	Less than significant
Impact Water-5: The Proposed Action could expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	Significant	Implement Mitigation Measure 3.19-3 (above).	Less than significant
Wildland Fire Ecology			
Impact Fire-1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death.	Significant	**Mitigation Measure 3.20-1**: The Applicant shall prepare and implement a Fire Safety Plan to ensure the safety of workers and the public during Project construction, operation and maintenance, and decommissioning activities. The Fire Safety Plan shall be provided to the BLM and the County's Victorville Fire Protection office (VFPO) for approval before the Applicant receives a Notice to Proceed (NTP). The Fire Safety Plan shall include, but not be limited to, the following elements: 1. All internal combustion engines used at the Project site shall be equipped with spark arrestors. Spark arrestors shall be in good working order. 2. Once initial two-track roads have been cut and initial fencing completed, light trucks and cars shall be used only on roads where the roadway is cleared of vegetation. Mufflers on all cars and light trucks shall be maintained in good working order. 3. Fire rules shall be posted on the project bulletin board at the contractor's field office and others areas such that they would be visible to employees. 4. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials. 5. The Applicant shall make an effort to restrict use of chainsaws, chippers, vegetation masticators, grinders, drill rigs, tractors, torches, and explosives to outside of the official fire season. When the above tools are used, water tanks equipped with hoses, fire rakes, and axes shall be easily accessible to personnel.	Less than significant

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Wildland Fire Ecology (cont.)			
Impact Fire-1 (cont.)		6. Smoking shall be prohibited in wildland areas and within 50 feet of combustible materials storage, and shall be limited to paved areas or areas cleared of all vegetation. 7. Each Project construction site (if construction occurs simultaneously at various locations) and the proposed solar plant site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires. 8. The Applicant shall coordinate with the VFPO to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site. 9. All construction workers, plant personnel, and maintenance workers visiting the plant and/or transmission lines to perform maintenance activities shall receive training on the proper use of fire-fighting equipment and procedures to be followed in the event of a fire. Training records shall be maintained and be available for review by the VFPO. 10. Vegetation near all solar panel arrays, ancillary equipment, and access roads shall be controlled through periodic cutting and spraying of weeds, in accordance with the Vegetation Management Plan. 11. The BLM and VFPO shall be consulted during plan preparation and fire safety measures recommended by the agencies included. 12. The plan shall list fire prevention procedures and specific emergency response and evacuation measures that would be required to be followed during emergency situations. 13. All on-site employees shall participate in annual fire prevention and response training exercises with the VFPO 14. The Applicant shall designate an emergency services coordinator from among the full-time on-site employees who shall perform routine patrols of the site during the fire season equipped with a portable fire extinguisher and communications equipment. The Applicant shall notify the BLM and County of the name and contact information of the current emergency services coordinator in the event of any change. 15. Remote monitoring of all major electrical equipment (transformers and inverters) will screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating which under certain conditions could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken. 16. Fires ignited on site shall be immediately reported to BLM FIRE and the VFPO. 17. The engineering, procurement, and construction contract(s) for the proposed project shall clearly state the requirements of this mitigation measure.	

TABLE ES-2 (Continued)
SUMMARY OF CEQA IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED ACTION

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Energy Conservation			
Impact Energy-1: The Project could result in an inefficient, wasteful, and/or unnecessary use of energy for transportation of materials and worker commutes.	Significant	**Mitigation Measure 3.21-1:** The Applicant shall develop and implement a construction- and decommissioning-phase Transportation Energy Management Plan in consultation with the BLM and San Bernardino County to reduce construction- and decommissioning-related transportation energy consumption. The plan shall include but not be limited to the following measures: 1. Require that on-site equipment and vehicle operators minimize equipment and vehicle idling time either by shutting equipment off when not in use or by limiting idling time to a maximum of 5 minutes. 2. Register with SANBAG's Rideshare Incentives program. 3. Designate a Transportation Energy Manager (TEM) to coordinate ridesharing by construction and decommissioning employees. The TEM shall encourage carpooling by posting commuter ride sign-up sheets, maintaining and posting an employee home zip code map, and educating employees about how to access the incentives they may be eligible for under SANBAG's Rideshare Incentives program. 4. Provide priority parking on-site for vehicles with two or more passengers. 5. When feasible, arrange for a single construction vendor who makes deliveries for several items. 6. Plan construction delivery and waste hauling routes to eliminate unnecessary trips. The plan shall be submitted to the BLM and San Bernardino County for review and approval prior to the start of construction.	Less than significant

CHAPTER 1
Introduction and Purpose and Need

1.1 Introduction

This Draft Plan Amendment (PA) and Environmental Impact Statement/Environmental Impact Report (EIS/EIR) is a joint document published by the Bureau of Land Management (BLM) and San Bernardino County, California (County) (collectively, Lead Agencies). BLM is the Lead Agency under the Federal Land Policy and Management Act of 1976 (FLPMA), which governs the PA process, and under the National Environmental Policy Act (NEPA), which governs the EIS. The County is the Lead Agency under the California Environmental Quality Act (CEQA) which governs the EIR.

This Draft PA/EIS/EIR analyzes impacts of the Soda Mountain Solar Project (Project) described in the Plan of Development submitted by Soda Mountain Solar, LLC[1] (Applicant) in its application for a right-of-way (ROW) grant to authorize the use of land administered by the BLM. The application was filed on March 15, 2011 (Caithness Soda Mountain, LLC, 2011), and revised in March 2013 (Soda Mountain Solar, LLC, 2013). This Draft PA/EIS/EIR also analyzes the impacts of the Groundwater Well Permit application filed with the County in September 2012 (Soda Mountain Solar, LLC, 2012).

The Project site is located approximately 6 miles southwest of Baker, California, along Interstate 15 (I-15). The regional context is shown in Figure 1-1 and the Project location is shown in Figure 1-2 (see Appendix A for all figures referenced in this Draft PA/EIS/EIR). As reflected in the ROW grant application filed with BLM (CACA-049584), the Project would be located entirely on BLM-administered land in sections or portions of sections 1, 11, 12, 13 and 14, Township 12N, Range 7E; sections 25 and 36, Township 13N, Range 7E; sections 6, 7, 8 and 18, Township 12N, Range 8E; and sections 17, 18, 19, 20, 21, 29, 30, 31 and 32, Township 13N, Range 8E, San Bernardino Base and Meridian. The Applicant is seeking a ROW grant for approximately 4,179 acres (Soda Mountain Solar, LLC, 2013). The Project comprises construction and operation of solar arrays, access roads, collector lines, a substation, a switchyard, and ancillary buildings and other infrastructure which would result in the disturbance of approximately 2,557 acres within the ROW (see Table 2-1). Following final engineering, micro-siting and construction of the Project, areas that remain undisturbed and not within fenced areas would be relinquished by the Applicant from the ROW grant back to the BLM.

[1] Soda Mountain Solar, LLC is a subsidiary of Bechtel Development Company, Inc.

The Applicant proposes to construct, operate, maintain, and decommission a solar photovoltaic (PV) electric generating facility composed of three solar arrays, with a total capacity of approximately 358 megawatts (MW) (see Figures 1-2 and 2-1). The North Array would be developed on approximately 571 acres located on the northwest side of I-15; it would have a capacity of approximately 94 MW (Soda Mountain Solar, LLC, 2013). The East Array (consisting of two sub-arrays, East 1 and East 2) would be developed on approximately 397 acres located on the southeast side of I-15; it would have a capacity of approximately 60 MW (Soda Mountain Solar, LLC, 2013). The South Array (consisting of three sub-arrays, South 1, South 2, and South 3) would be the largest of the arrays. It would be developed on approximately 1,197 acres located on the southeast side of I-15, south of the East Array, and would have a capacity of approximately 204 MW (Soda Mountain Solar, LLC, 2013).

As part of preliminary work, a number of potential alternatives to the Project were identified and considered by the Applicant and the Lead Agencies. These include modified configurations on the proposed site; alternative PA decisions, sites, solar technologies, and energy generation technologies; and conservation and demand-side management. Of the various alternatives considered, four “action” or “build” alternatives were determined to be potentially feasible by the BLM: Alternative A, the Proposed Action, which consists of the Project as submitted by the Applicant; Alternative B, which would reduce development north of I-15 relative to Alternative A; Alternative C, which would reduce development east of I-15 relative to Alternative A; and Alternative D, which would allow continued Off-Highway Vehicle (OHV) use along the existing Rasor Road, a BLM-designated Open Route (OHV use is permitted by the BLM). Each of the action alternatives would include the amendment of the California Desert Conservation Area Plan of 1980, as amended (CDCA Plan), approval of a ROW grant by the BLM, and County approval of a groundwater well permit. The action alternatives are described in Section 2.5; the need for a CDCA Plan amendment is summarized in Section 1.3.3. Three no action/no project alternatives also have been carried forward for detailed analysis: Alternative E, which is the No Action/No Project alternative and would not involve an amendment of the CDCA Plan; Alternative F, which is a BLM Action/County No Project alternative (i.e., a scenario that could occur if the BLM approved the requested ROW grant and the County denied the groundwater well permit application); and Alternative G, under which BLM would not approve a ROW grant, the County would not approve the groundwater well permit application, and the CDCA Plan would be amended to identify the area as unsuitable for solar development.

Publication in the Federal Register of the U.S. Environmental Protection Agency’s (USEPA) Notice of Availability (NOA) of the Draft PA/EIS/EIR initiates a 90-day public review and comment period under BLM Land Use Planning regulations (43 CFR 1610.2) and NEPA. Similarly, the County’s filing of a Notice of Completion (NOC) with the California State Clearinghouse initiates a concurrent 45-day public comment period under CEQA. Because this is a joint EIS/EIR and the BLM is mandated by regulation to hold the comment period open for 90 days, the County has elected to exercise its discretion to respond to comments that are received after the close of the 45-day CEQA review period, but within the 90-day BLM review period (Pub. Res. Code §21091(d); 14 Cal. Code Regs. §15105).

1.2 Purpose and Need and Project Objectives

1.2.1 BLM Purpose and Need

The BLM's purpose and need for the Project is to respond to the Applicant's application under Title V of the FLPMA (43 USC §1761(a)(4)) for a ROW grant to construct, operate, maintain, and decommission a solar PV facility on public lands in compliance with FLPMA, BLM ROW regulations, and other applicable federal laws. In accordance with Section 103(c) of the FLPMA, 43 USC §1702(c), public lands are to be managed for multiple uses that take into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant ROWs on public lands for systems for generation, transmission, and distribution of electric energy (43 USC §1761(a)(4)). Taking into account BLM's multiple use mandate, the BLM will decide whether to approve, approve with modifications, or deny issuance of a ROW grant to the Applicant for the Project. The BLM may include any terms, conditions, and stipulations it determines to be in the public interest, and may include modifying the proposed use or changing the route or location of the proposed facilities (43 CFR 2805.10(a)(1)).

The Project, if approved, also would assist the BLM in addressing several management and policy objectives advanced through the following authorities applicable to the BLM:

1. Executive Order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."

2. Secretarial Order 3285A1 (March 11, 2009, as amended February 22, 2010), which "establishes the development of renewable energy as a priority for the Department of the Interior."

3. The President's Climate Action Plan, released on June 25, 2013, which sets forth a new goal for the Department of the Interior to approve 20,000 MW of renewable energy projects on the public lands by 2020, in order to ensure America's continued leadership in clean energy.

In connection with its decision on the Project, the BLM's action also will include consideration of a concurrent amendment of the CDCA Plan. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission that are not identified in the CDCA Plan be added to it through the land use plan amendment process. California Desert Conservation Area (CDCA) boundaries are shown on Figure 1-1. The Project site is within the CDCA, but is not identified in the CDCA Plan for solar power generation. Therefore, if the BLM decides to approve the issuance of a ROW grant for the Project, a CDCA Plan amendment also would be required.

1.2.2 CEQA Project Objectives

In accordance with CEQA, the needs and objectives of the Project are defined by the Applicant. This PA/EIS/EIR does not adopt or endorse the objectives that the Applicant has defined, which are to:

1. Create an economically viable source of clean renewable electricity generation;
2. Provide power to help California's utilities meet the growing demand for electrical power;
3. Locate the Project on an at-least- 2,500-acre site with high solar insolation, minimal vegetation, a relatively flat slope (i.e., under 5 percent), and highway access that is located near existing transmission lines with available capacity to facilitate interconnection;
4. Meet Project needs while minimizing environmental impacts;
5. Provide renewable energy that assists California utilities in meeting Renewable Portfolio Standard (RPS) targets; and
6. Provide a source of renewable energy that fulfills many federal energy policies.

The County, as CEQA Lead Agency, has distilled the Applicant's stated objectives into the "basic" objectives that have been relied upon in crafting alternatives to the Project (see CEQA Guidelines §15126.6).[2] The basic objectives of the Project are to construct, operate, maintain, and decommission a cost-efficient, environmentally sound solar-powered generating facility on lands within close proximity to transmission infrastructure.

1.3 Relationship of Proposed Action to BLM Laws, Policies, Plans, and Programs

1.3.1 Federal Land Policy Management Act

BLM's authority and policy guidance for making a decision related to the Proposed Action derives from FLPMA (43 USC §1701 et. seq.). FLPMA provides the BLM's overarching mandate to manage the lands and resources under its stewardship based on the principles of multiple use and sustained yield. Multiple use is a concept that directs management of lands and resource values in a way that best meets the present and future needs of Americans and is defined as "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources" (FLPMA §103(c), 43 USC §1702(c)). FLPMA authorizes the BLM to issue ROW grants for systems of generation, transmission, and distribution of electric energy. In processing a land use plan amendment, BLM also must comply with its Planning Regulations (43 CFR Part 1600) and the BLM Land Use Planning Handbook (H-1601-1; March 2005).

[2] Section 15126.6 requires an EIR to describe a range of reasonable alternatives to the project, or its location, that feasibly would attain *most of the basic objectives* of the project even if these alternatives would impede to some degree the attainment of the project objectives as stated by the Applicant. The range of alternatives analyzed in this PA/EIS/EIR is described in Section 2.4

1.3.2 Solar Energy Development Policy

Instruction Memorandum (IM) 2011-003, issued October 7, 2010, updated the Solar Energy Development Policy (IM 2007-097) issued April 4, 2007. The Solar Energy Development Policy provides agency guidance on the processing of ROW applications and the administration of ROW authorizations for solar energy projects on BLM-administered public land. The BLM's policy is to facilitate environmentally responsible development of solar energy projects on the public lands, consistent with the provisions of Secretarial Order 3285A1 dated March 11, 2009, as amended February 22, 2010.[3]

Together, these authorities require utility-scale solar PV electric generating facilities to comply with the BLM's planning, environmental, and ROW application requirements and to be processed and authorized as ROWs under Title V of the FLPMA and Title 43, Part 2800, of the Code of Federal Regulations (CFR). In particular, IM 2011-003 provides policy guidance on early coordination with federal land managers, such as the National Park Service (NPS) and United States Fish and Wildlife Service (USFWS), and stakeholders (including San Bernardino County, state agencies such as California Department of Fish and Wildlife [CDFW], and tribal governments identified in Section 4.2.2). Consistent with IM 2011-003, opportunities have been provided to potentially affected parties and interests to participate in meetings with the Lead Agencies and the Applicant. IM 2011-003 also directs that, if approved, ROW authorizations for all solar energy projects subject to the policy shall be issued "for a term not to exceed 30 years."

1.3.3 CDCA Plan

BLM-administered lands in the California Desert District are governed by the CDCA Plan. Multiple use class boundaries in the Project area are shown on Figure 1-2. The Project site is located within Multiple Use Classes L (Limited Use), M (Moderate Use) and I (Intensive Use) of the BLM's CDCA Plan. These classifications are described in Section 3.9. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not specifically identified in the CDCA Plan (like the Project site) be considered through the PA process, and that NEPA requirements be met for the proposed use. The proposed land use plan amendment decisions are described in Section 2.3. The planning criteria, description of the PA process, decision criteria for the BLM's evaluation of a PA application, decision criteria for the BLM's evaluation of a PA, and analysis of consistency of the proposed PA with the CDCA Plan are provided in Section 3.9. This PA/EIS/EIR meets NEPA's requirements for consideration of the Project.

[3] The BLM recognizes that these policies were incorporated into and superseded by the ROD for the Solar PEIS; however, as discussed in Section 1.3.4, the application before the BLM is a "pending application" for purposes of the Solar PEIS ROD. The BLM will process pending solar applications consistent with land use plan decisions in place prior to amendment by the Solar PEIS ROD and policies and procedures currently in place (e.g., IM 2011-060 [BLM 2012a] and IM 2011-061 [BLM 2012b]), or as may be modified in the future.

1.3.4 Approved Resource Management Plan Amendments/ Record of Decision for Solar Energy Development in Six Southwestern States (Solar PEIS)

The BLM is responsible for the development of energy resources on BLM-administered lands in an environmentally sound manner. To address increased interest in solar energy development and to implement the national energy policy recommendation to increase renewable energy production, the BLM undertook efforts to evaluate solar energy potential on public lands and establish solar energy policy. The BLM, in cooperation with the DOE, prepared a programmatic environmental impact statement (Solar PEIS) in July 2012 to evaluate the potential environmental, social, and economic effects of the proposed actions and alternatives to determine the best management approach for the BLM to adopt to further facilitate utility-scale solar energy development and maximize the mitigation of associated potential environmental impacts.

The Final Solar PEIS analyzed three alternatives for managing solar energy development on BLM-administered lands in the six-state study area, including the comprehensive Solar Energy Program that ultimately was adopted. The Program, adopted through the October 2012 Record of Decision (ROD), included amendments to 89 BLM land use plans not only to support solar energy development on public lands, but also to minimize potential environmental, cultural, and socioeconomic impacts. As part of the Program, the BLM identified priority areas (solar energy zones or SEZs) that are well suited for utility-scale production of solar energy, variance areas outside of SEZs where solar development would be open to applications, and areas to be excluded from utility-scale solar energy development.

The Project is considered a “pending” application for the purposes of the Solar PEIS. The BLM defines “pending” applications as any applications (regardless of place in line) filed within proposed variance and/or exclusion areas before publication of the Supplement to the Draft Solar PEIS (October 28, 2011) and any applications filed within proposed SEZs before June 30, 2009. The BLM will process pending solar applications consistent with existing land use plan decisions in place prior to amendment by the Solar PEIS ROD. When processing these applications, the BLM will consider its current policies and procedures (e.g., IM 2011-060 [BLM 2011a] and IM 2011-061 [BLM 2011b]), including interagency coordination with DOI agencies, or other applicable policies and procedures that the BLM might adopt in the future.As a pending application, the Project will be processed under the CDCA land use plan decisions in place prior to the adoption of the Solar PEIS, as described in Section 1.3.3. This EIS/EIR uses site-specific information to analyze direct, indirect, and cumulative effects of the Project and alternatives to provide the Authorized Officer with the needed analysis to make a decision on the Project and associated CDCA Plan Amendment.

1.3.5 Desert Renewable Energy Conservation Plan

As part of the Renewable Energy Action Team (REAT), the BLM is working with other federal and state agencies to develop the Desert Renewable Energy Conservation Plan (DRECP) as a key component of California's renewable energy planning efforts. The DRECP addresses

approximately 22.5 million acres of federal and non-federal land in the Mojave and Colorado deserts, including lands in seven California counties: Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego. The DRECP is proposed as a land use plan amendment in accordance with FLPMA, a Habitat Conservation Plan (HCP) to comply with the Federal Endangered Species Act (FESA), and a Natural Community Conservation Plan (NCCP) to comply with the California NCCP Act and the California Endangered Species Act (CESA). When finalized and adopted, the DRECP will help provide effective protection and conservation of desert ecosystems while allowing for the appropriate development of renewable energy projects. More information about the DRECP is available on the website for the project, drecp.org. (CEC, 2012).

Appendix I to the Description and Comparative Evaluation of Draft DRECP Alternatives[4] provides data and other information about how projects for which an existing application is pending before the BLM are to be treated under the DRECP. For those solar applications that are currently undergoing NEPA review, the DRECP ROD will not affect applications that reach a project-level ROD prior to completion of the DRECP. For those solar applications that will not reach a project-level ROD prior to completion of the DRECP, the land use allocation decisions made in the DRECP ROD (including, for example, decisions close or open an area to solar energy development, or additional mitigation requirements) will not affect project applications if the project meets specified criteria:

1. A project that is proposed in a BLM Solar Energy Zone and that is considered a "pending project" under the Solar PEIS ROD (i.e., the project application was filed before June 30, 2009).

2. A project with a published Draft EIS or EA no later than 60 days after release of the DEIS for the DRECP provided the project-level NEPA document includes:

    a. Analysis using the best available information at the time of publication, including data developed in support of the DRECP conservation and recreation strategies, and

    b. Analysis describing the relationship between the project and the DRECP conservation and recreation strategies.

If a project falls within criterion 2, that analysis may be in the project's FEIS if the project's DEIS is published before the DRECP DEIS. If the criteria cannot be met, the pending project would be subject to the DRECP. As of the publication of this document, the DRECP DEIS has not been published.

[4] The Description and Comparative Evaluation of Draft DRECP Alternatives is accessible online (http://www.drecp.org/documents/docs/alternatives_eval/Appendices/). Appendix I in particular may be accessed via this link: http://www.drecp.org/documents/docs/alternatives_eval/Appendices/Appendix_I_Pending_Projects.pdf.

1.4 Relationship of the Project to County Requirements

The County's water well ordinance (County Code §§33.0630-33.0645) provides minimum standards for the construction, reconstruction, abandonment, and destruction of all wells relating to groundwater protection in order to: (a) protect underground water resources, and (b) provide safe water to persons within San Bernardino County (County Code §33.0630). Specifically, no person or entity may dig, drill, bore, drive, reconstruct or destroy an observation or exploration well without first filing a written application to do so with the County Department of Environmental Health Services (DEHS) and then receiving and retaining a valid permit (County Code §33.0631). The Applicant filed a groundwater well permit application for the Project in September 2012 (Soda Mountain Solar, LLC, 2012). Any well permit approval "may include conditions and requirements found by DEHS to be reasonably necessary to accomplish the purposes of [the ordinance]" (Id.). Because the County's well permit process is a discretionary one, the County must consider the environmental effects of the whole of the Project in accordance with CEQA before it may approve the permit. This Draft PA/EIS/EIR, as it may be revised in response to agency and public comments and finalized in a Proposed PA/Final EIS/EIR, will be relied upon by the County in making a determination whether to approve, deny, or approve with modifications the Applicant's groundwater well permit application.

1.5 Document Organization

This document follows regulations promulgated by the Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508); the Department of the Interior's NEPA regulations, 43 CFR Part 46; the BLM NEPA Handbook, H-1790-1; FLPMA §§201, 202, and 206, 43 USC §§1711, 1712, and 1716, 43 CFR Part 1600; the BLM Land Use Planning Handbook, H-1601-1; DOE's NEPA implementing procedures (10 CFR 1021); CEQA (Pub. Res. Code §21000 et seq.) and the CEQA Guidelines (14 CCR §15000 et seq.). This Draft PA/EIS/EIR describes the components of and reasonable alternatives to the Proposed Action and environmental consequences of the Proposed Action and other alternatives.

The PA/EIS/EIR is organized as follows:

Chapter 1 provides general background on the Proposed Action; identifies the BLM's purpose and need for action and, for CEQA purposes, the Project objectives for the Proposed Action. It also provides context to aid an understanding of how the proposal fits in the BLM's overall plan for the management and administration of public lands.

Chapter 2 describes the Proposed Action and the alternatives development and screening process conducted for the Project. It presents a range of reasonable alternatives that address the stated purpose and need for the Proposed Action and meet most of the basic objectives of the Project. Chapter 2 also identifies other potential alternatives and explains why they were considered but not analyzed in detail.

Chapter 3 describes the affected environment (existing conditions) for 20 environmental resource and issue areas that could be affected by the Proposed Action and alterntives, provides a comprehensive analysis and assessment of impacts (direct, indirect, and cumulative), and identifies mitigation measures that would avoid or reduce the effects of the Proposed Action and alternatives. It also describes other aspects of BLM compliance with NEPA procedures, including a description of unavoidable adverse impacts (called "residual impacts" in this document) and the commitment of resources (40 CFR §1502.16), as well as addressing CEQA-specific requirements for environmental analysis.

Chapter 4 identifies the persons, groups, agencies, and other governmental bodies that were consulted or that contributed to the preparation of the PA/EIS/EIR; describes Native American consultations and public participation during scoping; provides a list of PA/EIS/EIR preparers; and lists agencies, organizations, and persons to whom the PA/EIS/EIR will be or has been sent.

Chapter 5 includes a list of acronyms and abbreviations used in the PA/EIS/EIR.

Chapter 6 includes a glossary of Project-specific and environmental terms used in the PA/EIS/EIR.

Appendices contain information that supplements or supports the analyses in the body of the PA/EIS/EIR.

1.6 Permits and Approvals

The Applicant will obtain all required permits and meet other requirements set forth by law, regulation, ordinance, and policy. The environmental effects of compliance with all applicable permit requirements are analyzed as part of the Project throughout Chapter 3 of this PA/EIS/EIR. Table 1-1 summarizes the potential permit requirements and other entitlements that have been identified to date.

TABLE 1-1
SUMMARY OF POTENTIAL PERMIT REQUIREMENTS AND OTHER APPROVALS

Agency	Permits and Other Requirements	Jurisdiction/Purpose
Federal Agencies		
Bureau of Land Management (BLM)	Right-of-Way (ROW) Grant	Authorization to use the affected BLM-administered public lands as requested for the project
	California Desert Conservation Area (CDCA) Plan Amendment	Required if a ROW grant were authorized for a solar power generating facility on the Project site
United States Fish and Wildlife Service (USFWS)	Federal Endangered Species Act (FESA) §7 Incidental Take Statement	Consultation and authorization for potential take of threatened and endangered species listed under the FESA (16 USC 1531 et seq.).
United States Army Corps of Engineers (USACE)	If required, a Clean Water Act (CWA) §404 permit	Potential impacts associated with the discharge of dredged or fill material into to Waters of the United States, including the aquatic ecosystem, water quality, and wetland resources, under §404 of the CWA.
State Agencies		
California Department of Fish and Wildlife (CDFW)	California Endangered Species Act (CESA) Consistency Determination or Incidental Take Permit	Potential impacts to species that are protected under the CESA (Fish and Game Code §2050 et seq.)
	Streambed Alteration Agreement	Modifications to streambeds (Fish and Game Code §1602)
California Department of Transportation (Caltrans)	Encroachment Permit	Construction, operation, and maintenance within, under, or over state highway ROW
Lahontan Regional Water Quality Control Board	Title 27 Discharge Permit (if evaporation ponds are necessary)	Evaporation ponds; requires adherence to Waste Discharge Requirements (WDRs)
	CWA §401 Water Quality Certification or Waste Discharge Requirements for Discharge of Dredge and/or Fill Material to Waters of the State	Certifies that project is consistent with Section 401 of the Clean Water Act, if applicable, and/or state water quality standards (Porter Cologne Water Quality Control Act)
State Water Resources Control Board	If required, NPDES Construction Stormwater General Permit	Required for projects with 1 acre of more of land disturbance and potential impacts to waters of the U.S. or waters of the State.
Local Agencies		
San Bernardino County	Groundwater Well Permit	Construction, operation, and maintenance of groundwater wells in accordance with §33.06554 of the San Bernardino County Code of Ordinances
Mojave Desert Air Quality Management District	Dust Control Plan	For construction activity in Mojave Desert Planning Area (MDAQMD Rule 403.2)

References

BLM, 2012a. Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States, Volume 6, Part 1, Appendices A–I. July. [http://solareis.anl.gov/documents/fpeis/Solar_FPEIS_Volume _6_Part_1.pdf]

BLM, 2012b. Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States. October. [http://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf]

Caithness Soda Mountain, LLC, 2011. Plan of Development Soda Mountain Solar Project. March 15.

California Energy Commission, 2012. Desert Renewable Energy Conservation Area. Dec. 18.

Soda Mountain Solar, LLC, 2013. Soda Mountain Solar Project Revisions to March 2011 Plan of Development. March.

Soda Mountain Solar, LLC, 2012. Groundwater Well Permit Application, Soda Mountain Solar Project, San Bernardino County, California. September.

CHAPTER 2
Proposed Action and Alternatives

2.1 Introduction

This chapter describes the Applicant's proposal to construct, operate, maintain, and decommission an approximately 358-megawatt (MW) solar PV energy generating facility and related infrastructure on BLM-administered land in unincorporated San Bernardino County, California, to be known as the Soda Mountain Solar Project (Project). The Project and requisite CDCA Plan Amendment collectively are referred to in this document as the "Proposed Action."

This chapter also describes the process that the BLM and the County used to screen potential alternatives to the Proposed Action. Based on that screening, the BLM and County determined that the Proposed Action (Alternative A), as described in Section 2.4, and action Alternatives B, C, and D (each of which is described in Section 2.5) met all of the screening criteria and were carried forward for detailed analysis in Chapter 3. Alternatives E, F and G, a No Action/No Project alternative, CEQA No Project alternative, and No Project/CDCA Plan Amendment alternative, respectively, also are analyzed in Chapter 3. Potential alternatives that did not meet the screening criteria listed below were eliminated from further analysis; these are described in Section 2.9.

2.2 Alternatives Development and Screening

Alternatives to the Proposed Action were screened for NEPA (see BLM NEPA Handbook §6.6.3) and CEQA (14 Cal. Code Regs. §15126.6(a)) purposes based on the following criteria:

1. Does the alternative respond to the BLM's purpose and need?
2. Does it meet most of the basic objectives of the Project?
3. Is its implementation technically or economically feasible?
4. Is it consistent with the basic policy objectives for the management of the area?
5. Is its implementation remote or speculative?
6. Is it is substantially similar in design to an alternative that is analyzed?
7. Would it have substantially similar effects to an alternative that is analyzed?
8. Would it avoid or substantially lessen any significant effects of the Project?

This process for eliminating potential alternatives from detailed analysis complies with 40 CFR Section 1502.14(a), BLM IM 2011-059, and CEQA Guidelines Section 15126.6.

2.3 Proposed Land Use Plan Amendment Decisions

A CDCA Plan amendment would be required if a ROW were granted for a solar power generating facility on the Project site. Regardless of whether the Project is approved, the BLM could elect to amend the CDCA Plan to identify the development footprint as suitable for solar energy development. As described in Section 1.3.4, the Project is a pending application and, therefore, is not subject to the Solar PEIS or the decisions made in the associated ROD; however, if the Project were denied, the CDCA Plan amendments made in the Solar PEIS ROD would apply to any ROW application filed on the Project site in the future. Consequently, the range of outcomes of the BLM's CDCA Plan amendment process for the Project includes the following:

PA1: The CDCA Plan would be amended to identify the development footprint as suitable for the proposed type of solar energy use. This amendment would be required for the BLM to grant a ROW authorization for Alternative A, B, C, D, or F.

PA2: The CDCA Plan would be amended to identify the development footprint as not suitable for the proposed type of solar energy use. This could occur under Alternative G.

PA3: The CDCA Plan would not be amended. (Based on the CDCA Plan amendments made in the Solar PEIS ROD, for future applications the site would be identified primarily as variance areas open to future applications for solar development, subject to the procedures identified in the Solar PEIS, and some exclusion areas in the southeast portion of the site that would be closed to such applications. In the case of variance areas, future projects would still require a CDCA Plan Amendment to move forward.) This could occur under Alternative E.

2.4 Proposed Action (Alternative A)

Soda Mountain Solar, LLC (the Applicant) proposes to construct, operate, maintain, and decommission the proposed 358 MW solar Project in a location approximately 6 miles southwest of the town of Baker, California, along I-15 as shown in Figure 1-2.

The Applicant provided technical information about the Project described in this section in its: March 15, 2011 Plan of Development (POD) (RMT, Inc., 2011a); March 27, 2013 Revised POD (Soda Mountain Solar, LLC, 2013a); September 2012 Groundwater Well Permit Application (Panorama Environmental, Inc., 2012); and in responses to data requests made by the BLM (Soda Mountain Solar, LLC, 2013c, 2013d). All numbers, including those referring to land disturbance, equipment, schedule, mileage, and workforce, are based on the most current data available as of the publication of this Draft PA/EIS/EIR and generally represent conservative estimates for the purposes of analyzing impacts. The numbers may change based on final engineering and various agencies' permit requirements. Based on this input, key components of the Project are:

1. The solar plant site, i.e., all facilities that create a footprint in and around the field of solar panels, including: the solar field (consisting of solar power arrays identified as the North Array, East Arrays 1 and 2, and South Arrays 1, 2, and 3); operation and maintenance buildings and structures; water supply and stormwater infrastructure; and related infrastructure and improvements;
2. A substation and switchyard for interconnection to the existing transmission system; and

3. Relocation of Rasor Road.

Key components of the Project are shown in Figure 2-1. The Project would operate year-round, and would generate electricity during daylight hours when the sun is shining. The Project would generate and deliver solar-generated power to the regional electrical grid through an interconnection with the existing Marketplace-Adelanto 500 kV transmission line operated by the Los Angeles Department of Water and Power (LADWP).

The Applicant submitted a SF-299 requesting a ROW grant (Application CACA-049584) from the BLM for the Project (Soda Mountain Solar, LLC, 2013b). The BLM must consider the effects of granting the ROW to construct, operate, maintain, and decommission of the proposed Project through the National Environmental Policy Act (NEPA). If a ROW grant is approved, then a land use plan amendment also would be required to identify the site in the CDCA Plan as a suitable site for the solar project. The CDCA Plan amendment also would require analysis of potential impacts under NEPA.

The Project includes the construction and operation of groundwater wells (see Section 2.4.2.8), which will be evaluated as part of the Project within this PA/EIS/EIR. Well construction requires a permit in San Bernardino County, and the Applicant has submitted a permit application to the County. The County's decision regarding issuance of the well permit is a discretionary action requiring CEQA review under the San Bernardino County Code of Ordinances Section 33.06554.

2.4.1 Project Location and Existing Land Use

The Project site is located entirely on BLM-administered land in a rural area of the Mojave Desert, approximately 6 miles southwest of the town of Baker, California and approximately 50 miles northeast of Barstow, and is located on both the northwest and southeast sides of I-15 (Figures 1-1 and 1-2). It is near the western boundary of the Mojave National Preserve. The Project site is located in sections or portions of sections 1, 11, 12, 13 and 14, Township 12N, Range 7E; sections 25 and 36, Township 13N, Range 7E; sections 6, 7, 8 and 18, Township 12N, Range 8E; and sections 17, 18, 19, 20, 21, 29, 30, 31 and 32, Township 13N, Range 8E, San Bernardino Base and Meridian. The Project site is located in the Mojave Desert Air Basin and within a sub-basin of the Soda Lake Valley Groundwater Basin. The lands in the vicinity of the site are populated with a number of existing infrastructure developments that include the I-15 highway, two transmission lines, a distribution line, cell towers, a fiber optics line, a fuel pipeline, and a telephone line. The former Arrowhead Trail Highway that was replaced by the I-15 highway traverses the eastern side of the Project site. The XpressWest project (formerly called the "DesertXpress High Speed Passenger Rail Project") has been also been permitted to run through this corridor. Active mining claims are present to the north and west of the North Array. A gas station is located near the southwest corner of the Project site.

The Project is bounded to the south by the Rasor Off-Highway Vehicle (OHV) recreation area, also managed by the BLM. The ROW application area has been modified from the original application submittal to avoid encroachment into the OHV recreation area as well as to avoid Blue Bell Mine

Road, utility ROWs, mining claims, cultural areas, and Caltrans' I-15 ROW.[1] The ROW has been reduced from the original proposal of approximately 9,555 acres to 4,179 acres. The site plan has also been modified to avoid major drainage washes and to maintain corridors for wildlife movement.

Primary access to the Project area on the southeast side of I-15 during construction and operation would be via a gated entrance from Rasor Road, which would be relocated to the south side of the ROW area along the southern Project boundary as part of the Project (see Section 2.4.2.6 for additional details). Access to the portion of the Project site on the northwest side of I-15 would be via the existing Blue Bell Mine Road off of the Zzyzx Road exit from I-15, near the northeast corner of the North Array (see Section 2.4.2.6 for additional details). Additionally, a Caltrans access road to the Opah Ditch pit mine would be used for construction of the collection line to the substation or to allow Project site access.

The Project site is within the BLM's California Desert District and within the planning boundaries of the CDCA Plan, which is the applicable Resource Management Plan (RMP) for the Project site and the surrounding areas. Portions of the Project site occupy areas designated multiple-use Class L ("Limited"), Class M ("Moderate"), and Class I ("Intensive") in the CDCA Plan (see Figure 1-2). Solar energy facilities are permitted in each of these multiple use classes provided the BLM complies with NEPA and follows the CDCA Plan amendment process (BLM, 1999). There are no Wilderness Areas, Areas of Critical Environmental Concern (ACECs), Desert Wildlife Management Areas (DWMAs), or Wildlife Habitat Management Areas (WHMAs) within the site.

Portions of the Project site are located within a designated federal Section 368 Energy Corridor adjacent to I-15 (Corridor number 27-225). An existing Southern California Edison (SCE)-owned 115 kV subtransmission line and an LADWP-operated 500 kV transmission line run parallel to and adjacent to the western perimeter of the Project site. The Rasor OHV Recreation Area, to the southeast of the Project area, is currently accessed via Rasor Road, and access to the OHV area would continue following the proposed relocation of this road.

2.4.2 Project Facilities

The Project would consist of several solar panel arrays (see Figure 2-1). The North Array would be located on the northwest side of I-15 and the East Arrays (consisting of two sub-arrays, East 1 and East 2) and South Arrays (consisting of three sub-arrays, South 1, South 2, and South 3) would be located on the southeast side of I-15. The operation and maintenance building and storage area for all three arrays would be located at the southwestern corner of the site, adjacent to South Array 3. A high-voltage substation and switchyard are proposed northwest of I-15 adjacent to the LADWP 500 kV transmission line. The specific location of the interconnection between the substation and the transmission line would be refined during detailed design through

[1] The Applicant's initial POD was filed on September 12, 2008. It later was modified to respond to comments from the BLM Barstow Field Office and resubmitted on March 27, 2009, then revised and resubmitted a second time on December 1, 2009. Revisions to the POD also were submitted in 2011 (RMT, Inc., 2011a) and 2013 (Soda Mountain Solar, LLC, 2013a).

coordination between the Applicant and the LADWP. Within the Project site, 34.5 kV underground collection lines would connect the solar panel arrays to the substation.

The approximate disturbance acreage within the requested 4,179-acre ROW for the solar arrays and other Project components is 2,557 acres (provided in Table 2-1). The area required for permanent structures is smaller than the area that would be subject to either temporary or permanent disturbance. The estimate for permanent disturbance includes all areas within the Project security fence and areas of temporary disturbance for the installation of temporary desert tortoise fencing, underground collector lines, and temporary construction roads. The Applicant would restore these areas to pre-Project conditions following construction.

TABLE 2-1
PROPOSED ACTION ESTIMATED TEMPORARY AND PERMANENT SURFACE DISTURBANCE

Project Component	Temporary[1] Area of Disturbance (acres)	Permanent Area of Disturbance (acres)	Total Area of Disturbance (acres)
Solar Arrays[2]	62	2,165	2,227
Substation, Switchyard, and Interconnection	25	15	40
Rasor Road Realignment	55	13	68
Access Roads	97	9	106
Berms	13	20	33
Collector Routes	24	0[3]	24
Laydown Area	30	0[3]	30
Temporary Desert Tortoise Exclusion Fence	29	0[3]	29
Total	**335**	**2,222**	**2,557**

NOTE:
1 The California Department of Fish and Wildlife (CDFW) considers all areas of temporary impacts to be permanent in the desert.
2 Solar array permanent disturbance is calculated as all areas within the solar array security fence. Solar array temporary disturbance includes areas within 30 feet outside of the solar array security fence, excluding other Project components. Project components included within the solar array security fence include the operation and maintenance buildings, warehouses, water tanks, wells, water treatment facility, and brine ponds. Impacts for these components are accounted for in the impacts for the solar arrays
3 Areas would be reclaimed after construction.

SOURCE: Soda Mountain Solar, LLC, 2013a.

2.4.2.1 Solar Panel Arrays and Support Structures

The Project would employ flat-plate polycrystalline silicon solar panels to generate power for delivery to the high-voltage transmission grid. Individual panels would be mounted on aluminum frames and attached to corrosion-resistant steel linear tracker structures oriented in a north-south direction. The panels would rotate so that the collecting surface follows the sun from east to west during the day. Trackers would be grouped into tracking assemblies, with each assembly consisting of 20 rows of single-axis trackers, 1 motor, and 1,140 panels. Each 2- MW power block would comprise eight8 such tracking assemblies. These components are described in more detail below.

Spacing between the tracker rows in an east-west direction would be 13 to 18 feet, on center. Spacing between the assemblies in the north-south direction would be at least 8 feet. Each 2- MW block (including the buffer around it for stormwater drainage, if necessary) and associated

internal access roads would occupy an area of approximately 12.4 acres (540,000 square feet). The front surface of the collectors would appear dark blue or black. The color of the rear surface would be white.

The following description of Project components and infrastructure is based on the Project's preliminary site design. During final design, the configuration and number of components may vary as a result of micrositing, but would occur within the footprint analyzed.

North Array

The North Array would be located on the northwest side of I-15 and would have a capacity of approximately 94 MW on 571 acres.

East Arrays

The East Arrays (East 1 and East 2) would be located on the southeast side of I-15 and would have a total capacity of approximately 60 MW on 397 acres.

South Arrays

The South Arrays (South 1, South 2, and South 3) would be located on the southeast side of I-15, south of the East Arrays, and would be the largest of the arrays, with 204 MW capacity on 1,197 acres.

Solar Panels

The Project would employ approximately 1.7 million flat-plate polycrystalline silicon solar panels. Each panel would have approximate dimensions of 3.3 feet by 6.6 feet and a capacity rating of approximately 300 to 320 watts. No cadmium telluride (CdTe) panels would be used.

Support and Mounting Structures

The Project would use single-axis linear trackers that rotate throughout the day to increase total solar exposure. Each tracker would be approximately 200 feet long and would be used to mount 54 to 60 solar panels. The trackers would be mounted on corrosion-resistant support posts spaced 13 feet apart along the length of the tracker that would be buried to a depth of 8 to 12 feet dependent on soil conditions. The trackers would be approximately 6 to 12 feet tall, depending on site conditions.

Solar Field Distribution

Underground 34.5 kV collector cable trenches would be located throughout the facility, as depicted in Figure 2-1. Power from each array would be collected into one group of cables. The cables from the South and East arrays would be collocated for the I-15 crossing. Each cable group would connect to the proposed substation.

Each of the 2 MW power blocks described above would feed power to two 1,000 kW inverters, which would convert the direct current (DC) electricity generated by the panels to 480 V, three-phase alternating current (AC) output. Each set of two inverters would then feed AC power to a medium-voltage transformer that would convert the AC power to 34.5 kV AC power for

transmission to the Project substation. The two inverters and one medium-voltage transformer associated with each 2 MW power block would be mounted adjacent to each other on a single 15- by 40-foot concrete pad or similar sized skids supported by posts driven into the ground. Auxiliary power distribution and control equipment would be located on the pads or skids.

2.4.2.2 Collection Lines

Within the Project site, 34.5- kV collection cables would connect the solar panel arrays to the substation. Collection lines would originate from the North Array, East Arrays, and South Arrays to conduct power from the medium-voltage transformers, described above, to the Project substation, described below. These collection lines would be installed underground. Each collector line circuit, consisting of three single aluminum conductors, would carry between 15 and 25 MW of peak power. A total of 15 to 24 circuits of collector lines are anticipated for the entire Project. The collection lines originating southeast of I-15 would cross I-15 at a single location, and would continue along Opah Ditch Mine Road underground to the substation location. Collector lines would be located in multiple trenches within an approximately 150-foot-wide corridor along Opah Ditch Mine Road. This configuration would reduce heat-related line losses.

2.4.2.3 Substation and Switchyard

The high-voltage substation and switchyard would be constructed on the west side of the Project site, northwest of I-15, and would permanently occupy approximately 15 acres. The switchyard would be located near LADWP's Marketplace-Adelanto 500- kV transmission line ROW. A substation and switchyard grounding grid would be installed. Multiple cement pads and cement piers would be constructed as foundations for substation equipment and the remaining area would be graveled. Concrete piers and footings would be installed to support the two turning structures that connect to the existing transmission towers, switchyard, and substation buswork. Electrical transformers, switchgear, and related substation facilities would be designed and constructed to transform the 34.5 kV power on the collection lines to the 500 kV transmission line voltage. A permanent gated, 7-foot-high chain-link fence with three-strand barbed wire meeting National Electric Safety Code requirements would be constructed around the substation and switchyard. The primary components of the substation and switchyard are shown in Figure 2-3 and include:

1. One or more 500:34.5 kV step-up transformers with an aggregate rating of approximately 358 megavolt-amperes (MVA);
2. One or more 500 kV circuit breakers for high-side protection of the step-up transformer(s);
3. 34.5 kV feeder breakers for termination of approximately 15 to 24 collector feeders; and
4. Associated instrument transformers, protection, control, and communication equipment.

2.4.2.4 Site Security and Fencing

The Applicant would fence the perimeter of the Project arrays and operation and maintenance area would be fenced with combined security fencing and desert tortoise fencing to limit unauthorized access and minimize impacts to desert tortoise. During construction, the Applicant would post safety and warning signs at the gate located at the Rasor Road access point, and at

regular intervals along the perimeter fence, informing the public of construction activities and directing the public to stay off the site. The Applicant would also erect temporary warning fences around laydown areas or in areas where public safety risks could exist and where site personnel would not be available to control public access (e.g., excavated foundation holes and electrical collection system trenches). Similarly, fencing would be installed around laydown areas. The BLM would allow the Applicant to fence other areas deemed hazardous, or where issues with security or theft are of concern.

During operation, the Applicant would secure the ROW primarily using warning signage and perimeter fencing, and may use perimeter security cameras. The Project switchyard and substation would be permanently fenced for safety. Security cameras also may be installed to assist site security personnel in monitoring the Project boundaries. The BLM would make a final decision on the approach to permanent site security just prior to the completion of construction to ensure the most current technology can be employed.

Combined security and desert tortoise fencing is proposed to be installed surrounding each individual sub-array (North, East 1 and 2, and South 1, 2, 3) as shown in Figure 2-1. Security fencing would consist of an 8-foot-high chain link fence. The fencing would be offset from the edge of panels by 10 to 20 feet. Security fencing would not be used in the major drainage washes to minimize impacts on wildlife corridors and storm water flow. Breakaway fencing may be used if needed along larger drainages. Breakaway fencing would consist of a driven post with detachable connections just above ground level, which allow the fencing to yield to the force of a storm event without damage to the embedded portion of the post. Following such an event the fence would be reattached to the post.

Desert Tortoise Exclusion Fencing

Desert tortoise exclusion fencing would be installed around the perimeter of the Project work areas, including the Rasor Road relocation area, access roads, and collector routes (Figure 2-1). Where security fencing is proposed in the same location as desert tortoise fencing, tortoise fence would be attached to the 8-foot-high standard chain link fencing along the bottom 2 feet of the security fence, and buried into the ground to preclude the movement of tortoises through or under the fencing. The top end of the tortoise fence would be secured to the security fence with hog rings at 12- to 18-inch intervals. Distance between posts would not exceed 10 feet. Temporary desert tortoise exclusion fencing would be removed from the major washes after the completion of construction, if acceptable to USFWS and CDFW.

2.4.2.5 Operation and Maintenance Area Facilities

Buildings

The following buildings would be constructed as part of the Project (see Figure 2-2).

1. Operation and Maintenance Building – approximate dimensions: 50 feet by 100 feet and 30 feet high
2. Maintenance Facility – approximate dimensions: 40 feet by 60 feet and 35 feet high

3. Storage/Warehouse Facility – approximate dimensions: 60 feet by 100 feet and 35 feet high
4. Reverse Osmosis Facility (if required) – approximate dimensions: 50 feet by 80 feet and 25 feet high

Operation and maintenance buildings would be located in an operation and maintenance facilities area sited at the primary entrance to the Project area adjacent to the existing Rasor Road. It is anticipated this area would be located within the ROW close to the Rasor Road exit from I-15.

Ancillary Facilities

A septic system would be designed and constructed adjacent to the permanent Project buildings. The system would be designed in accordance with applicable standards. A percolation report and plot plans would be submitted to the BLM and the San Bernardino County Division of Environmental Health Services for review and approval, and an associated permit application would be submitted to the San Bernardino County Building and Safety Department. Geological studies performed for the Project showed that, given the available land area and depth to groundwater, a septic system can be constructed and safely operated in accordance with applicable plumbing codes (Caithness Soda Mountain, LLC, 2011).

A temporary construction storage building would be located adjacent to the permanent warehouse described above and would have approximate dimensions of 40 feet by 80 feet.

Parking Areas

Parking areas would be located adjacent to the buildings described above. The parking areas are not expected to exceed about 0.33 acres, or 13,200 square feet. Parking would be provided for the maximum anticipated 40 regular employees during Project operation, for visitors, and for other vehicular equipment anticipated to be on the site at any time.

2.4.2.6 Access Roads

External Access Roads

Rasor Road would be used as the primary access route to the site on the southeast side of I-15. The Project would include the relocation of a portion of Rasor Road to the south side of the ROW. The Applicant proposes that the relocated portion of Rasor Road would be a 26-foot-wide, two-lane, unpaved road along the southern Project boundary. Long-term access to the Project operation and maintenance area would be provided via a gated entrance off this relocated portion of Rasor Road. Access to the Project site on the northwest side of I-15 would be via the existing Blue Bell Mine Road, Arrowhead Trail, and Opah Ditch Mine Road off of the Zzyzx Road exit from I-15, in the northeast portion of the Project site. The existing LADWP/Southern California Edison (SCE) transmission maintenance road may be upgraded for access to the LADWP switchyard and Project substation, or alternatively, a new graded, unpaved road would be constructed from Blue Bell Mine Road to provide access to the substation as described below.

Internal Access Roads

An approximately 16-foot-wide access road would be constructed from Blue Bell Mine Road to the substation and switchyard. An access road would also be constructed from the LADWP transmission line access road to the substation and switchyard. Two temporary access roads would be located between each of the South sub-array fields and between South 1 and the East Arrays (see Figure 2-1). Only one access road between each sub-array would be used during operation (permanent access road). The remaining access road would be reclaimed following the completion of construction. The temporary and permanent inter-array access roads would be approximately 16 feet wide. The exact location of these access roads will be determined during detailed design. Tortoise guards would be located at each permanent access road entrance/exit from the solar array field.

Access within the solar array fields would be provided using unpaved, unimproved internal corridors and would be designed for use by operation and maintenance vehicles. The corridors would incorporate buried electrical lines for the low-voltage circuits as described above under the heading *Solar Field Distribution*.

2.4.2.7 Temporary Construction Workspace, Yards, and Laydown Areas

The Project construction laydown area would occupy an area of 30 acres within the ROW. The Applicant anticipates using two 15-acre laydown areas, one on either side of I-15, or one 30-acre area on one side of I-15. The laydown area(s) would include air-conditioned temporary construction offices, a first- aid station and other buildings, worker parking, and truck loading and unloading facilities, and may be utilized as an area for staging a small number of modules, trackers, and inverters skids. The areas within the array footprints would be used as the primary material and equipment laydown area during construction. Security fencing would be installed around laydown areas not otherwise located within the Project security fence.

2.4.2.8 Water Supply, Storage, and Use

Groundwater Supply and Pipeline

The Applicant proposes to construct up to three wells in the Project area for non-potable water supply for construction and operation. These possible well locations were evaluated using data from boreholes (Diaz Yourman & Associates, 2010; Wilson Geosciences, Inc., 2011), geophysical studies to evaluate depth to water and depth to bedrock (Terra Physics, 2010), and groundwater modeling to identify potential well locations (RMT Inc., 2011b). The well depth of each well would depend on the depth to groundwater, type of alluvial sediments or bedrock encountered during drilling, hydraulic aquifer characteristics (yield and storage capacity), and the maximum required flow rate.

The Applicant estimates that no more than three 6-inch-diameter polyvinyl chloride wells would be sufficient to provide the water needs for the Project. Each well would be fitted with a 10-horsepower submersible pump, capable of supplying 95 gpm at 300 feet of head. Production requirements for a new wells (volume and flow rate) would dictate pump size and well casing

diameter. A pipeline would carry water from the wells to the operation and maintenance and storage buildings. The Applicant would be required to obtain an industrial well permit from the San Bernardino County Department of Public Health prior to well construction and installation.

Also prior to construction, the Applicant proposes to complete a 72-hour aquifer test. The test would include construction of a production/test well, observation well, and a distance observation well within the Project ROW. The distance observation well would be located approximately 1,000 feet from the test well and within the alluvial aquifer underlying the Project site. The aquifer test would be conducted upon completion of the test well and observation wells for a minimum of 72 hours, or as determined by the professional hydrogeologist or geologist. During the aquifer test, groundwater would be discharged from the test well at a rate of approximately 200 gpm (equivalent to maximum Project demand of 300,000 gpd). The necessary permit(s) shall be obtained from the Regional Water Quality Control Board prior to the discharge of groundwater.

Groundwater Treatment

If the groundwater analysis indicates that treatment of the pumped groundwater is required, a reverse osmosis (RO) system would be used to reduce total dissolved solids (TDS) concentrations to acceptable levels for Project use, including dust control, fire suppression, and PV panel washing. The high-TDS reject water from the RO system would be stored in on-site brine ponds. The water treatment system would be sized to provide enough water for panel washing and site operations. All water rejected from the RO system due to high TDS would be piped to brine ponds, which would occupy an area of approximately 4 acres. These ponds would be designed to allow evaporation of liquid, leaving salts and minerals that would be cleaned out periodically and disposed of at a licensed landfill. The side slopes of the brine ponds would be constructed of earthen berms from on-site soils. Soil excavated to create the pond would be utilized to construct the perimeter berms. Berms would be graded with 3:1 (H:V) side slopes. The brine ponds would be constructed with a plastic liner and a leak detection system beneath the liner. Each pond would be designed and constructed as a Class II Waste Management Unit in accordance with California Code of Regulations Title 27 Guidelines. The ponds would be permitted in accordance with requirements of the Lahontan Regional Water Quality Control Board (RWQCB). The brine ponds would be located near the operation and maintenance building within the Project security fence. The brine ponds would be designed to prevent or restrict access to these ponds by wildlife and would be covered by wire grids incorporating visual features such as plastic colored ribbons designed to deter birds and bats.

Water Storage

Three permanent water storage tanks would be installed during the construction phase. One approximately 5,000-gallon potable water supply tank and one approximately 22,500-gallon tank for fire suppression water would be located near the operation and maintenance building. Additionally, one approximately 42,000-gallon water tank would be located near the southern entrance to the Project site and would store water for use during panel washing. Multiple temporary tanks would be located on site to provide water storage for dust control and soil

compaction during construction. The tanks would be housed on trailers located along access roads or within areas that have been cleared for installation of Project components.

Construction-related Water Needs

The Applicant estimates that 200,000 gallons per day (gpd) [2] or approximately 192 AFY would be needed during construction for dust control and other non-potable construction-related uses. Four or five temporary water tanks of 20,000 gallons would be brought on site by truck to store water in anticipation of construction water needs. The tanks may be moved around the site as construction progresses and would be used to fill on-site water trucks. The tanks would be removed after construction. Over the 24- to 30-month construction period, total non-potable construction water consumption would be approximately 384 to 480 AF.

The total potable water consumption during construction would be approximately 1.6 AFY. Potable water for on-site use would be trucked to the site due to the expected high boron and fluoride content in groundwater pumped from the proposed water supply well(s) (DWR, 2003).

Operation and Maintenance-related Water Needs

Project operation would require water for potable use, dust control, panel washing, and fire protection. General operational water demand values are shown in Table 2-2.

TABLE 2-2
OPERATION AND MAINTENANCE-RELATED WATER USE

Activity	Volume	Timing
PV Panel Washing	5.4 AFY	120 days per year
Fire Suppression	0.07 AF per tank fill	Periodic (as needed)
Dust Suppression	26 AFY	Periodic (as needed)
Potable Water Uses	1.6 AFY	365 days per year
Total	**33 AFY**	

SOURCE: Soda Mountain Solar, LLC, 2013a.

The anticipated daily potable water demand for the operation and maintenance building is based on the number of employees and guidance in Table K-3 of the California Plumbing Code (24 CCR Part 5) regarding wastewater facility sizing. The Applicant anticipates that 40 employees may be present for extended periods, that each employee could require up to 35 gpd potable water (for drinking, showering, and other uses), and that at least 3 days' worth of water storage would be required. To meet this need, an approximately 5,000-gallon potable water storage tank would be installed on-site. Potable water would be trucked to the site.

Dust and dirt build-up on solar panels reduces the amount of incoming solar radiation striking the active PV layer within the panel. To reduce this effect, panel washing would be conducted at

[2] This assumes a 6-day work week.

regular intervals throughout Project operation. The Applicant estimates that panel washing would require 5.4 AFY over 120 days per year of washing. Based on the Applicant's assumptions about panel washing, the average water usage for washing would be approximately 14,900 gpd. An approximately 42,000-gallon water tank would be installed on a high point near the operation and maintenance building to provide storage of panel washing water. The tank would be filled with groundwater from the well(s) described above. The water then would drain by gravity to panel-washing trucks for use.

For fire suppression water supply, the Applicant would conform to San Bernardino County requirements, which incorporate National Fire Protection Association (NFPA) standards 1142 and 13 by reference, and provide minimum requirements for fire suppression water supply where no public water supply is available (Standard 1142), and for sprinkler systems (Standard 13). The minimum fire suppression water supply for the Project based on these requirements is 14,400 gallons, and the minimum sprinkler system water storage volume is 22,500 gallons. The Applicant proposes to construct a dedicated 22,500-gallon tank next to the operation and maintenance building for fire suppression and/or sprinkler system use. The tank would not require a regular supply of water because the water would be withdrawn only in the event of a fire. The tank would be monitored periodically and refilled as needed to replace evaporative losses.

An estimated 26 AFY of water would be used for dust control during operation in compliance with the Project dust control plan and mitigation measures described in Chapter 3 of this PA/EIS/EIR. Alternatively, dust palliatives may be applied.

Decommissioning and Site Reclamation-related Water and Wastewater Needs

A draft Decommissioning and Closure Plan is attached as Appendix C. Because equipment technologies and decommissioning techniques are expected to change during the course of the 30- to 40-year life of the Project, the plan would not be finalized until closer to the time of facility closure to assure that it addresses actual site conditions. As proposed in the draft Decommissioning and Closure Plan, standard dust control mitigation measures required by the Mojave Desert Air Quality Management District (MDAQMD) would be implemented to reduce dust particulate emissions during demolition and restoration activities. Water consumption during decommissioning and site reclamation is not expected to exceed construction water consumption rates.

2.4.2.9 Drainage and Erosion Control

Existing site runoff patterns would be preserved to the extent feasible. Upgradient stormwater runoff would not be diverted around solar arrays. The development would not detain runoff or substantially interfere with existing drainage patterns on or off the Project site and would preserve existing sediment transport throughout the site. Wildlife exclusion fencing may include break-away fences (see Section 2.4.2.4) to allow larger flow events to pass through the array area. Fencing would be inspected after rain events and replaced or maintained as needed.

Grading of up to 1,155 acres and the other types of ground treatment described in Section 2.4.3.2 would be conducted outside of existing major drainage channels to the extent feasible and would not involve substantial changes to site topography. Once construction is complete, the topography

beneath the solar panels would generally be the same as the baseline condition except in areas where soil has been compacted or rocks and isolated surface undulations have been removed by grading. Vegetation would be allowed to reestablish naturally and would be trimmed during operation as necessary.

Runoff from the alluvial fan north and west of the North Array would be permitted to flow through the solar field through the existing shallow channels, maintaining existing flow patterns to the extent feasible. A berm would be constructed along the south edge of the North Array outside the main flow area of the existing swale to the south, as shown in Figure 2-1, to prevent occasional side channel flows from entering the solar field. The same construction techniques used for the North Array would be used for the East Arrays.

The design of the South Arrays would avoid placing solar panels within the flow corridors downstream of the three existing culverts under I-15 so that flows from the culverts to follow existing braided flow channels. Development would be limited to access road crossings and potential subsurface collector lines. Protection berms would be constructed along the edges of the South Arrays near these flow corridors to prevent occasional side channel flows from entering the solar field.

A preliminary Water Quality Management Plan (RMT, 2011a, Appendix D) has been prepared in accordance with San Bernardino County stormwater regulations. BMPs would be implemented as required by the Lahontan Regional Water Quality Control Board (RWQCB).

2.4.2.10 Waste and Hazardous Materials Management

Wastewater

During construction, portable sanitary facilities would be located in the Project area and maintained by a local contractor. Concurrently, a septic system would be designed and constructed adjacent to the Project buildings to support operation and maintenance employee's sanitary needs.

During operation, the daily wastewater flow for 40 employees (assumed to be 35 gpd per employee consistent with California Plumbing Code Table K-3) would be 1,400 gpd. The septic tank size must be 1.5 times the daily flow for flows under 1,500 gpd. This results in a tank size of 2,100 gallons. A 2,500-gallon septic tank is common and readily available from prefabricated tank suppliers in the area. In areas of fine sand, 25 square feet of leaching area are required per 100 gpd of wastewater. This results in a required leaching area of 350 square feet for the Project.

Solid and Hazardous Wastes

Construction would generate solid waste, as described in Table 2-3. All waste generated during construction would be stored in wind-proof and wildlife-proof containers that periodically would be transported to an off-site disposal facility authorized to accept the waste.

During operation and maintenance, some PV panels would require replacement due to breakage or other damage or to take advantage of new technologies. Removed PV panels would be recycled or disposed of in accordance with applicable standards and regulations.

TABLE 2-3
CONSTRUCTION WASTE TYPES, VOLUMES, AND MANAGEMENT APPROACHES

Waste Type	Composition	Estimated Quantity	Frequency of Generation	Management Approach
Construction waste (hazardous)	Empty hazardous material containers	1 cubic yard (cy) per week	Intermittent	Accumulate on site for up to 180 days. Return to vendor or dispose at permitted hazardous waste disposal facility.
Construction waste (hazardous)	Solvents, used oil, paint, oily rags	100 gallons	Every 90 days	Accumulate on site for up to 90 days. Recycle or dispose at permitted hazardous waste disposal facility.
Spent batteries	Lead acid, alkaline type	10 in 2 years	Intermittent	Accumulate on site for up to 90 days. Recycle.
Construction waste (non-hazardous)	Scrap wood, concrete, steel, glass, plastic, paper	20 cy per week	Intermittent	Recycle when feasible. Dispose to Class III landfill when not feasible to recycle.
Sanitary waste (non-hazardous)	Portable chemical toilets, sanitary waste	100 gallons per day	Throughout construction	Pump to tanker truck by licensed contractors who would dispose at wastewater treatment plant.
Office waste (non-hazardous)	Paper, aluminum, food	1 cy per week	Intermittent	Recycle when feasible. Dispose to Class III landfill when not feasible to recycle.
Removed solids from brine ponds	Evaporated minerals	Would be determined by TDS concentrations in groundwater	Intermittent	Remove and dispose to Class III landfill.

SOURCE: Soda Mountain Solar, LLC, 2013a.

Small amounts of oils and greases, special wastes, and fuels would be stored as required in accordance with applicable standards and regulations. Hazardous materials that may be used and stored during construction and/or operation and maintenance could include paints, thinners, solvents, sealants, lubricants, drilling mud (for drilling cable conduits under I-15 and possibly for water well drilling), and chemicals related to the reverse osmosis water treatment system such as sulfuric acid, sodium hypochlorite, and caustic soda. The quantities and concentrations of these hazardous substances are not expected to reach or exceed regulated levels. Facility transformers would contain non-polychlorinated biphenyl- (PCB-) rated dielectric fluid.

Hazardous materials would be stored within secondary containment to control any potential leaks of oils, greases, fuels, and other hazardous materials stored at the Project site. All potential contaminants would be stored and used at least 50 feet from any defined or constructed channels or basins at all times. If required by the San Bernardino County Fire Department – Hazardous Materials Division, a Spill Prevention Control and Countermeasure (SPCC) Plan would be developed prior to Project construction in accordance with applicable regulations (see Section 3.8), and would include a facility diagram that would identify: the location and contents of hazardous materials containers; potential equipment failures; containment and diversionary structures; facility drainage; personnel, training, and spill prevention procedures; and emergency contact information. Diversionary structures meeting the requirements of the SPCC Plan would

be provided for oil-containing equipment, including transformers, at the Project site. Transformers would be inspected on a regular basis to detect and respond to any leakage.

All use, storage, transport, and disposal of hazardous materials associated with the Project would be done in strict accordance with federal, state, and San Bernardino County regulations and guidelines. Employees would be trained in the appropriate protocol for notification and cleanup of hazardous materials. Additionally, the site would be supplied with adequate spill containment kits and personal protective equipment in case of a release. Construction equipment and maintenance trucks would be maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. No extremely hazardous materials currently are anticipated to be produced, used, stored, or disposed of as a result of the Project.

Most of the fuel required by construction and operation staff vehicles and engines would be procured at commercial gas stations in the local area, such as at the service station at Rasor Road or in Baker. To fuel construction equipment, mobile fueling and maintenance vehicles would be brought on a daily basis as needed. A limited amount of #2 diesel and gasoline petroleum fuels (approximately 500 gallons each) may be stored in the staging areas within above grade steel tanks located within secondary containment.

Material safety data sheets (MSDSs) for the hazardous materials that are expected to be used and/or stored on site would be retained on site.

2.4.2.11 Lighting

During construction, lighting would be strategically located for safety and security in the construction trailer staging area, parking area, and around site security facilities. Lighting would be located on temporary service poles. Power for the lights would come from the proposed distribution line or construction office trailer generator. Lighting is not planned for construction activities; however, if required, it would be limited to the locations and amounts needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operation and maintenance, lighting would be provided at the site entrance, operation and maintenance building, substation, and switchyard. Exterior security lighting would be installed to provide for safe access to Project facilities as well as visual surveillance. Some portable lighting could also be required for essential nighttime maintenance activities. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required. All lights would be hooded and directed to minimize backscatter and off-site light.

During site closure and decommissioning, safety and security lighting would be provided using a combination of the installed lighting system and portable lighting if required. As with the other Project phases, lighting would be focused downward, shielded, and directed so as to minimize light exposure to areas outside the work area.

2.4.2.12 Vegetation Management

The Applicant would maintain existing vegetation to the extent possible. However, Project construction may require that existing desert scrub vegetation be removed from portions of the Project area. Up to the maximum number of acres identified as permanent disturbance in Table 2-1 may be mowed of vegetation. Additional acreage would be cleared of vegetation to allow for installation of buildings, the substation, access roads, fencing, and collector lines. Up to 1,155 acres may be graded for construction of access roads, installation of collector lines, and to smooth out isolated surface irregularities and to remove oversize rocks.

Surface treatments such as grading, discing, or mowing can create potential habitat for non-native or invasive species that infiltrate the area. The Applicant has submitted Pesticide Use Proposals (PUPs) and a draft Integrated Weed Management Plan (IWMP) for the BLM's consideration (see Appendix E-2). All pesticides to be used on site would require a PUP approved by the BLM California State Office. Additionally, any herbicides used to manage vegetation on site would have to be consistent with an approved PUP and be on the active ingredient list in the Preferred Alternative of the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement (Herbicide FPEIS) (BLM, 2007) and the Final Vegetation Treatments Programmatic Environmental Report (PER).[3]

2.4.2.13 Health and Safety

The Applicant and its contractors would follow all federal Occupational Safety and Health Administration (OSHA) and state (Cal/OSHA) requirements for construction and operation. Prior to any construction activity on site, the Applicant would prepare a Health and Safety Plan, which would comply with OSHA and Cal/OSHA guidelines for the types of activities being performed. All personnel on site during construction and operation would be trained and given access to all appropriate OSHA and Cal/OSHA guidelines, and a safety and compliance coordinator would be assigned to the Project.

On-site employees would be provided health and safety training to address the potential issues associated with the Project. Additionally, employees would be trained on proper notification and containment following a release, as detailed in the SPCC plan. Employees tasked with monitoring releases would be trained and provided with personal protective equipment to ensure their safety.

To ensure the safety of the public, the ROW would be fenced and signs would be posted. Access to the site would be limited, as described in Section 2.4.2.4.

[3] The Record of Decision (ROD) associated with the Herbicide FPEIS (72 FR 57065-01), published October 5, 2007, outlines the herbicides that are approved for use on public lands, including 14 herbicides with the following USEPA registered active ingredients: 2, 4-D, bromacil, chlorsulfuron, clopyralid, dicamba, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr. The ROD also identifies the states where the active ingredients are approved for use based on state registration requirements. It also identified six herbicide active ingredients that are not permitted for use BLM lands unless a need is shown by the BLM and updated risk assessments for human health and ecological risks are assessed. The six precluded active ingredients are: 2, 4-DP, asulam, atrazine, fosamine, mefluidide, and simazine.

2.4.3 Construction

Prior to the onset of construction, desert tortoise exclusion fencing would be erected around the site and the site would be cleared of tortoises as described in Applicant Proposed Measure 66 (see Table 2-5, below). Construction would commence with site clearing and grading of the laydown areas and the substation location. The construction contractor would then survey, clear, and grade road corridors to allow equipment, materials, and workers to be brought to the construction area. Small temporary parking areas may be established adjacent to the array locations to allow direct access to work areas. Alternatively, larger central parking areas may be constructed, and vans or other vehicles would be used to bring workers, equipment, and materials to the area under construction. Materials and equipment would arrive on tractor-trailers at the staging area and would be brought to the installation location directly. After the initial solar arrays are installed and interconnected to the grid, they would begin generating power while additional PV blocks are constructed.

2.4.3.1 Site Preparation

The estimated temporary and permanent areas of land disturbance are shown in Table 2-1. The area estimated to be disturbed by arrays is based on the area within the fence line surrounding the arrays, although the final total disturbance footprint for all Project structures and buildings would be less than this estimate.

2.4.3.2 Surveying, Vegetation Removal, Grading, and Site Clearance

The solar arrays would be surveyed between 90 and 180 acres at a time. Within the surveyed area, larger vegetation would be cut or crushed as described below, and the ground would be prepared through isolated grading. The locations for the inverters, transformers, and buried electrical lines then would be surveyed.

Prior to construction, areas of the Project site proposed for the location of the array blocks and other infrastructure would undergo partial removal of scrub vegetation; plants would be cut back leaving the root structure and about 6 inches of stem in place. Isolated grading would be undertaken at minor drainage washes along the alignment of the wash, and would be used to level isolated undulations. Grading would also be conducted along access roads through the array blocks. Up to 1,155 acres would be graded for the Project (Panorama Environmental, Inc., 2013) and additional areas would be subject to disc and roll or another type of ground treatment. The final area and limits of grading will be determined during detailed design, but will be within the footprint of disturbance analyzed in this PA/EIS/EIR. The staging area, road corridors, building and substation location, and areas for other infrastructure would be cleared and graded. Rocks or boulders removed from the array area would be used as fill within the earthen berms. The remaining fill to construct the earthen berms would be taken from areas immediately adjacent to the berms.

Trenches would be located along roadways and areas already disturbed by the installation process. Roads would be constructed at grade to maintain existing sheet/shallow flow through the site during storm events. In select locations of the site, cut-and-fill may be required. The site-

specific SWPPP or BMP Plan required by the Lahontan RWQCB would provide a description of the erosion control methods planned for the site.

Draft grading plans will be developed by the Applicant prior to the start of construction. The draft grading plans will include proposed contours, grading daylight lines, flow lines, grade breaks, potential drainage features, and spot elevations sufficient to demonstrate that streets, driveways, parking lots, and drainage grades meet minimum requirements. Final design plan sheets would be prepared at appropriate scale and would show layout and location of site grading improvements and drainage facilities. Earthwork quantities (i.e., cut, fill, and net volumes) would be shown on the plans. Design section sheets would be produced at appropriate scale and would contain site cross sections and other pertinent features for proposed grading features corresponding to those depicted on the grading plans.

2.4.3.3 Solar Array Assembly and Construction

Construction of the solar arrays is expected to take place at a pace of approximately 3 MW per week. Construction of the arrays is generally expected to proceed from north to south; however, construction phasing would ultimately be determined by the terms of the Power Purchase Agreement (PPA). Array construction would begin with the installation of array support posts, which would be vibrated into the ground or bored or driven if necessary. Once the support structures are in place, solar panels would be attached to the support frame. The assembled groups of solar panels would be wired together into strings via connectors on the back of the modules. Assembled panel sections then would be connected to combiner boxes located throughout the arrays that would deliver power to the inverter. Inverters would be mounted on concrete pads or driven piles. Inverters and transformers would be brought in by tractor-trailers and delivered directly to the mounting pad sites.

Buried electrical lines for DC array wiring and AC wiring between inverters and transformers would then be installed using trenching machines. The trenches would be approximately 1 to 2 feet wide and 2 to 4 feet deep. The trenched areas would be filled once the cables are buried. After this work is complete, and depending on the level of ground preparation chosen, the surveyors, vegetation cutters, graders, and trenchers would move on to the next block. It is anticipated that the solar panels would require one washing during the construction phase prior to energizing and performance testing of the arrays in order to remove the dust that has accumulated on the panels during construction.

2.4.3.4 Collection Line Construction

The medium-voltage collection cables would be trenched at depths up to 4 feet using a trenching machine. The trenches would be approximately 12 to 24 inches wide. Multiple trenches may be placed adjacent to each other, depending on the number of collector circuits in a particular location. The cables would be manually placed within the trenches in layers (as necessary) followed by a backfill and compaction operation. Alternatively, a cable laybox would be used to automate the cable placement and backfill process. The main trenching operations would be for installation of DC cables from the combiner boxes to the inverter skids and installation of AC collector circuits between inverter skids and the substation. The exact locations would be determined during detailed

design. The laydown areas (approximately 100 feet by 100 feet) would generally be staged close to the work fronts, distributed throughout the arrays, and within disturbance limits.

The collector circuits from the East and South arrays would be routed to the Project substation by boring under I-15. The boring operation would be accomplished by constructing a boring pit on each side of I-15 to initiate and terminate the bore. The collector circuits would cross I-15 through 15 to 24 bores in a 150-foot-wide corridor at a 90-degree angle, and would be installed per Caltrans requirements. The collector cable would be installed by circuit in conduits, with each circuit contained in a single 6-inch diameter conduit (typical) spaced approximately 10 feet on center. Alternative design concepts for boring design may be considered based on Project requirements. The Applicant would coordinate closely with Caltrans and would secure the necessary encroachment permit for activities within Caltrans right-of-way. No overhead collector lines are proposed.

2.4.3.5 Substation and Switchyard Construction

At the same time the solar arrays are being constructed, separate crews would begin building the Project substation, switchyard, and the interconnection to the 500 kV transmission line. LADWP would be responsible for construction of the switchyard. One tower would be removed from the existing line and two turning structures would be constructed adjacent to the removed tower. The turning structures would direct the 500 kV transmission line into and out of the new switchyard. The substation and switchyard would be graded and compacted to an approximately level grade. Equipment would be staged adjacent to the site.

A substation and switchyard grounding grid would be installed as required. Multiple concrete pads and/or piers would be constructed as foundations for substation equipment and the remaining area would be graveled. Concrete piers and footings would be installed to support the transmission towers, switchyard, and substation buswork. Electrical transformers, switchgear, and related substation facilities would be designed and installed/constructed to transform the 34.5 kV power on the collection lines to the transmission line voltage. A chain-link fence would then be erected around the substation and switchyard.

2.4.3.6 On-site Building Construction

The on-site buildings are proposed to be pre-engineered metal buildings that would be fabricated off-site. Sections would be transported to the Project site for erection and assembly. The buildings would be anchored to concrete foundations on site. The interior details and other finish work would be completed on site after anchoring.

2.4.3.7 Access Road Construction

Access road construction activities would include improvements to existing roads, the realignment of Rasor Road, and construction of new internal roads for panel access and site maintenance. Roads are shown on Figure 2-1.

Existing site roads (mainly the southern entrance to the site, Blue Bell Mine Road, and the access road on the west side of the site parallel to the transmission lines) may require some reinforcement

with rip-rap or crushed aggregate during construction and maintenance of the Project. These additions would be limited to areas previously damaged by erosion or washed out in rain events or where sharp turns need to be widened to allow equipment deliveries. Most wash crossings would be at grade over wide channels with compacted native materials.

The relocation of Rasor Road would result in approximately 2.6 miles of newly constructed roadway 26 feet wide. The road surface would consist of graded and compacted native material. Aggregate surface material is not proposed.

To access the interior of the site during construction and operation, approximately 14.5 miles of graded access and maintenance roadways would be constructed. Access roads would be 16 feet wide and maintenance roads would be 10 feet wide. These roads would consist of compacted native material and would be graded as necessary, but generally would follow the existing terrain. Larger boulders that could impede vehicle access would be removed. These permanent access roads would be compacted to meet load requirements for vehicle traffic over the life of the Project.

2.4.3.8 Site Cleanliness

A full-time crew would be responsible for maintaining site cleanliness during construction, including collecting trash at the temporary construction facility, as well as at the various work fronts. All trash would be placed in containers with secure lids. All hazardous and non-hazardous waste would be stored in appropriate containers for off-site disposal.

2.4.3.9 Work Force, Schedule, and Equipment

Work Force

The construction workforce would consist of an average of 175 direct labor workers over the 24- to 30-month construction period. The construction work force would reachpeak at up to 250 directly employed labor workers during the height of construction. In addition to this direct labor workforce, approximately 25 to 40 additional workers at the site would engage in supervision, contract services, administration, and other non-direct labor activities.

Construction generally would occur between 6 a.m. and 6 p.m., Monday through Saturday. Sundays would be reserved to make up time in the schedule if needed. Some work may occur outside these hours to address emergent urgent situations, avoid adverse weather conditions including high summer temperatures, or perform work on active arrays after sunset.

Schedule

Construction is anticipated to occur over a 24-to 30-month period. Construction is expected to start promptly following the BLM’s issuance of a notice to proceed, which is anticipated to occur in the spring of 2014. Construction phasing will depend on the terms of the PPA, but is anticipated to comprise the following: 100 MW in Year 1, 125 MW in Year 2, and 125 MW in Year 3.

Equipment and Materials

Standard construction equipment would be used during construction, including earth-moving equipment (e.g., bulldozers, excavators, and backhoes) and road-building equipment (e.g., compactors, scrapers, and graders). Construction equipment would include air compressors, all-terrain passenger vehicles, backhoes, cranes, a drill rig, flat-bed trucks, a front-end loader, pick-up trucks, a pile driver, a trencher, and water trucks.

Concrete would be required for building or structure footings and foundations and pads for inverters, transformers, water tank footings, and substation equipment. In areas where driven support posts are not practical for the solar arrays, precast concrete ballasted supports may be used. An anticipated total of approximately 12,000 cubic yards of concrete would be used for the Project. Specifications for concrete would be determined during Project engineering, but would meet all applicable building codes. Concrete could be imported to the site from a local supplier, requiring 1,500 round-trip truck deliveries (these deliveries are included within the estimated average daily truck deliveries described below in Section 2.4.3.10). Alternatively, if an on-site temporary mobile concrete batch plant is used, it would be approximately 100 feet by 100 feet in size and 30 feet tall with an 8,000-lb capacity, and would be moveable to construction sites where concrete is needed. The estimated water demand for the batch plant is included in the construction water needs described above.

If it is determined that an on-site batch plant would be used, the Applicant would prepare a Concrete Housekeeping Plan that would outline measures to reduce waste and pollution, such as periodic inspection of equipment for leaks or use of an enclosed system for transfer of dust-generating materials. Batch plant operation would comply with the site-specific SWPPP or BMP Plan and California Stormwater BMP Handbook Section NS-16, Temporary Batch Plants. Stockpiled materials would be delivered in accordance with BMP Handbook Section WM-1, Material Delivery and Storage, and used in accordance with Section WM-2, Material Use. Concrete waste would be managed in accordance with California Stormwater BMP Handbook Section WM-8, Concrete Waste Management.

2.4.3.10 Construction Traffic

Over the approximately 24- to 30-month construction period, the Project would require approximately 3,000 truckloads of construction materials per month for delivery of components and construction materials, including concrete. Up to 90,000 truckloads would result over the total construction period, excluding travel by construction workers. If water is obtained from an off-site source during construction, an estimated 30 water transport truck trips per day would also be required. Average truck traffic would be approximately 120 trucks per day, 25 days per month. The Applicant would use a just-in-time delivery system with supplies and components delivered on a schedule to minimize on-site storage needs.

2.4.3.11 Construction Power

California Air Resources Board (CARB)-approved diesel generators and temporary interconnection to the local SCE power distribution system would be the primary sources of construction power. The generators would provide power to the temporary construction facility as well as to trailers at active work sites until the temporary connection to the distribution system can be established.

Diesel generators also would provide power to individual construction operations as needed. Final engineering would determine if a tie-in to the SCE distribution line or the permanent power distribution system is available. If the SCE distribution line has capacity to provide construction power, the connection would involve trenching a medium-voltage cable from the distribution pole to a location near the temporary construction facility (trailers) where a pad-mounted transformer would reduce the voltage to 480V for construction. The 480V supply would be connected to a distribution board that would feed electricity to the trailers. The approximate area of disturbance would be 50 feet by 40 feet for the transformer and distribution board.

2.4.4 Operation and Maintenance

Operational needs at the site include monitoring and optimizing the power generated by the solar arrays and interconnection with the transmission lines, operating the solar array tracking system, and conducting panel washing activities periodically through the year.

Maintenance activities would include inspecting, repairing, and maintaining the arrays and tracking systems and the Supervisory Control and Data Acquisition (SCADA) system; washing panels; and troubleshooting the collector lines and repairing damaged cables, which may necessitate some trenching. Additional maintenance would be required to maintain the administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site. The majority of planned maintenance activities would be performed before sunrise, with repairs made at sundown. To ensure security of the facility, nighttime security and monitoring personnel would be employed.

The Project substation would be unmanned during operation; however, on-site personnel would visit the substation as needed to operate equipment or interface with the relaying and metering equipment. One 500-gallon diesel tank or 50-cubic-foot propane tank would be kept on site permanently for emergency power generation use in the event of an electrical outage. The emergency generator would be located adjacent to the ancillary buildings on the southwest side of the Project site.

2.4.4.1 Operation and Maintenance Workforce

During operation, it is anticipated that the Project would require a workforce in the range of approximately 25 to 40 workers, which include a mix of professional staff and maintenance and security personnel. Final staffing levels and configuration would be based on the final site configuration and early operating and maintenance experience. Janitorial staff would be responsible for cleanliness of the operation and maintenance area. An initial estimate of the staff configuration is summarized in Table 2-4, below.

2.4.4.2 Automated Facility Control and Monitoring System

The Project would be operated and monitored by means of a SCADA system located in the control building. Sensors located at each inverter/tracker combiner would report operational parameters. Data access and inverters are controlled, either on site or remotely, through a high-security system. The non-conductive fiber optic communications cable would be co-located with the low-voltage DC and AC wiring to reduce environmental impacts.

TABLE 2-4
OPERATION AND MAINTENANCE WORKFORCE

Personnel Type	Number of Persons
Professional Staff	
Plant Manager	1
Operators (four shifts)	8
Engineer	1
Foreman	2
Administration	2
Accounts/Billing	2
Maintenance/Security	
Technical Maintenance	8
General Maintenance	12
Security	4
Total	**40**

Personnel communication would use two-way radio/receptor stations, which would require a Federal Communications Commission (FCC) license. A security camera system would monitor solar panels and equipment throughout the site.

2.4.4.3 Panel Washing

Dirt and dust can accumulate on solar panels over time, leading to lower power output. To maintain power output, panels may be washed one or two times per year; a wash for the entire facility would take 60 days. A description of planned washing water use is provided in Section 2.4.2.8.

2.4.4.4 Road Maintenance

Roadways throughout the site would be primarily unimproved and vehicular traffic throughout the site would be infrequent and would use low-impact vehicles. The Applicant anticipates that maintenance needs would be minimal. After major rain events, at-grade crossings of existing channels would be evaluated and maintenance efforts would be conducted as needed. Dust would be controlled using appropriate measures, such as polymer application, as needed.

2.4.5 Decommissioning and Site Reclamation

When the Project reaches the end of its useful life, structures and equipment would be removed for reuse, or sold as scrap, and the land surface would be reclaimed. The decommissioning and site reclamation activities that would occur are anticipated to be substantially in conformance with those described in the draft Decommissioning and Closure Plan provided in Appendix C. Because site conditions are likely to change over the life of the Project and to assure that the Decommissioning and Closure Plan addresses all necessary conditions, the draft will be finalized and approved by the BLM before decommissioning and reclamation activities begin.

2.4.5.1 Decommissioning of Applicant's Facilities

Construction hours and site cleanliness practices would be approximately the same during decommissioning as during construction.

Solar Plant Site Facilities

The Applicant is expected to receive authorizations and permits with 30-year terms. The Project is planned to be operated over the full 30-year term of the ROW agreement and beyond, subject to renewal. Renewal discussions are expected to occur near the end of the agreement term.

Upon decommissioning, aboveground structures would be dismantled and removed from the site. Where required by BLM, concrete pads or foundations would be demolished and rubble would be removed to an off-site disposal facility authorized to accept the waste. Belowground facilities may be disconnected at the surface and left in place in conformance with guidance and approval from the BLM. New Project access roads and corridors would be closed, with the exception of the relocated Rasor Road, which would remain accessible.

Collection Lines, Substation, and Switchyard

Decommissioning of the substation and switchyard would involve deconstruction of structures. Salvaged materials would be recycled to the extent possible. Material that cannot be recycled would be transported for disposal in authorized landfills. Underground cabling and conduit may be left in place.

Groundwater Wells

Well site decommissioning would comply with ASTM D5299, Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities and California Well Standard Bulletin 74-81, 74-90. The wells would be plugged and sealed and the concrete well pads would be removed. Upon decommissioning, the well sites would be reseeded with native vegetation.

2.4.5.2 Site Reclamation

The substation and office/storage areas would be graded to approximate the natural contour. The Applicant would prepare and implement a Final Closure and Reclamation Plan addressing removal of structures and site restoration in conformance with BLM requirements at the time of decommissioning.

2.4.6 Applicant Proposed Measures

The Applicant has proposed certain measures (Applicant Proposed Measures, or APMs) to reduce or avoid potential environmental impacts that could result from the Proposed Action. These APMs would be applied to all of the action alternatives described in this chapter (Table 2-5). These APMs would be implemented as design features, and are not "mitigation measures" as the term is used in the NEPA and CEQA contexts.

TABLE 2-5
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Air Resources	
1	The Applicant shall use periodic watering for short-term stabilization of disturbed areas to minimize visible fugitive dust emissions. Use of a water truck to maintain surface moisture on disturbed areas and surface application of water during visible dusting episodes shall be considered sufficient to maintain compliance.
2	The Applicant shall apply Best Management Practices (BMPs) to prevent Project-related visible bulk materials transport (trackout) onto paved surfaces. BMPs may include, but not be limited to, the following: • Use of wheel-washers (or equivalent) installed at all access points and laydown areas where trackout onto paved public roads could occur • Construction of stabilized construction site entrance/exit areas • Implementation of regular street sweeping/cleaning of paved surfaces • Installation of corrugated steel panels at all site exits
3	The Applicant shall cover haul vehicles loaded with earthen materials while operating on publicly maintained paved surfaces.
4	The Applicant shall stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 14 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.
5	The Applicant shall clean up project-related visible bulk materials transport (trackout) or spills on publicly maintained paved surfaces within 24 hours.
6	The Applicant shall discontinue non-essential earth-moving activities under high wind conditions when wind speeds exceed 25 miles per hour and those activities result in visible dust plumes. All grading activities shall be suspended when wind speeds are greater than 30 miles per hour.
7	The Applicant shall limit the speed of vehicles traveling on unpaved roads and disturbed areas to 15 miles per hour.
8	The Applicant shall apply water to all unpaved roads and unpaved parking areas actively used during construction, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.
9	The Applicant shall use off-road construction diesel engines that meet the Tier 3 California Emission Standards for Off-road Compression-Ignition Engines unless such engine is unavailable for a particular item of equipment. If a Tier 3 engine is unavailable, that engine shall be equipped with retrofit controls providing nitrogen oxides and particulate matter emissions equivalent to a Tier 3 engine.
10	The Applicant shall apply Level 3 diesel particulate filters to diesel engines of off-road construction equipment.
Geology	
11	Facilities will be built in accordance with San Bernardino County and California State Building Code requirements applicable to “Seismic Zone 3.” No human-occupied structures will be placed across the trace of a documented active fault. No human-occupied structure will be placed within 50 feet of the trace of an active fault or within a seismic special studies zone without a fault evaluation report, satisfactory to the State Geologist, demonstrating that no undue hazard would be created by the construction or placement of the structure.
12	Roads shall be constructed at grade to maintain existing drainage patterns during storm events. Unpaved access roads shall be constructed of compacted native soils. Rock or gravel may be added to unpaved roads for stabilization to prevent rutting or erosion.
13	Disturbed areas where clearing, grubbing, and cut-and-fill are required shall be compacted once construction is complete for greater resistance to wind erosion.
Groundwater	
14	The exact location of the test and observation wells described in Section 2.4.2.8 will be determined by a professional hydrogeologist or geologist with the goal of providing early warning of drawdown to the east. A test plan will be submitted to San Bernardino County and BLM a minimum of 14 days prior to performing the aquifer test.
15	The aquifer test data shall be analyzed by a professional hydrogeologist or geologist. The professional hydrogeologist or geologist will determine the number of project water supply wells required for the project by calculating the estimated drawdown in two wells using data from the 72-hour aquifer test (see APM 14, above) and assuming a maximum groundwater demand of approximately 300,000 gpd over the 3-year construction period. If one or more of the wells are expected to run dry at the maximum pumping rate, a third well will be required for the project.

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Groundwater (cont.)	
16	A water quality sample will be collected from the test well and analyzed for total dissolved solids (TDS) by a State of California-certified laboratory. The results will be evaluated by the project engineer to determine the need for a reverse osmosis facility to treat the water for panel washing.
17	The groundwater model will be recalibrated using the measured aquifer properties resulting from the 72-hour aquifer test (see APM 14, above). If the results of the recalibrated model indicate that reduction in outflow from the valley would be less than 50 AFY under proposed project conditions, then no further action will be taken. If the recalibrated model predicts reduced outflow from the northeast outlet of the Soda Mountain Valley (the Valley) in excess of 50 AFY, APM 18 will be implemented.
18	If, as described in APM 17, the recalibrated model predicts outflow from the northeast outlet of the Valley reduced by an amount in excess of 50 AFY, the Applicant will hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance of BLM and San Bernardino County. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Valley, in the alluvial aquifer adjacent to Soda Spring and west of Soda Lake, and at Soda Spring during construction of the project. If the Project is shown to cause a decline in groundwater levels of 5 feet or more in the alluvial aquifer near Soda Spring, or there is a decrease in groundwater discharge at Soda Spring as a result of Project groundwater withdrawal that results in the water level in the spring decreasing to less than 4 feet deep, which would threaten the tui chub [see Section 3.4, *Biological Resources – Wildlife*], an evaluation would be conducted to determine if the Project is causing reduced groundwater discharge at Soda Spring. If it is determined that the Project has caused a decrease in the volume of groundwater discharged at Soda Spring such that the spring is less than four feet deep, thereby threatening the tui chub habitat, then the project shall correspondingly curtail withdrawal of groundwater and import a corresponding amount of water from outside of the Valley. Groundwater level measurements in the monitoring wells located in the Valley would be compared to the model predictions on an annual basis during construction and every five years during project operation. The groundwater model would be recalibrated if the measured drawdown values in the monitoring wells exceed the predicted values by more than 15 percent. Monitoring would cease after 5 years of operational monitoring if two conditions are met: • The monitoring data support the model predictions. • The model predicts the reduction in outflow from the northeast outlet will be less than 50 AFY under proposed project conditions, as detailed in APM 17.
19	During the years of construction in which water extractions exceed 25 acre-feet per year, an annual report shall be provided and a fee shall be paid to the State Water Resources Control Board.
20	If crossing existing major washes is necessary, then at-grade crossings will be constructed where feasible, to maintain existing flow channels and sediment transport, thereby leaving stormwater runoff volume unchanged.
21	If the total dissolved solids values for project well water exceed levels for potable water, then potable water shall be provided from another source, such as a tanker truck.
Hazards and Hazardous Materials	
22	General material safety data sheets for all hazardous materials stored on site will be retained on site during project construction and operation.
23	On-site fueling of equipment and vehicles shall be completed in areas at least 100 feet away from drainages, or in designated fueling areas. Fuel stored on site will be located in areas with secondary containment, unless secondary containment is built into the tank.
24	Transformers shall be inspected for oil leakage on a regular basis and diversionary structures shall be provided for all oil-containing equipment, including transformers, at the project site.
25	Employees shall attend a health and safety training and shall be trained in the proper protocol for notification and cleanup of hazardous materials.
26	A Health and Safety Plan, which complies with all OSHA and Cal/OSHA guidelines for the types of activities being performed, shall be prepared and presented to all personnel on site during construction and operation.
27	During conductor installation, guard structures consisting of temporary H-frame poles shall be erected over any natural or manmade obstacles to shield them from falling objects.

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Noise	
28	Noise exposure for construction and maintenance workers shall adhere to all federal, California, and San Bernardino County noise exposure regulations.
Traffic	
29	The Applicant shall implement a departing vehicle plan if project traffic is scheduled between 10 a.m. and 6 p.m. on Fridays and/or between 11 a.m. and 8 p.m. on Sundays. The plan shall specify that work crew departures will be staggered on Friday and Sunday afternoons to avoid impacts to I-15 mainline traffic level of service (LOS).
30	The Applicant shall document road conditions of Rasor Road, Blue Bell Mine Road, and any other local construction access roads prior to and at the end of project construction and decommissioning. Roads will be restored to preconstruction (and pre-decommissioning) conditions if construction damage is documented. The Applicant shall present a plan for restoration to BLM and San Bernardino County within 60 days of completing construction and decommissioning. The restoration shall occur within 180 days of BLM and San Bernardino County approval of the plan.
31	Emergency access to the site shall be maintained at all times.
32	The relocated segment of Rasor Road shall be completed and open to traffic prior to the permanent closure and decommissioning of the pre-Project (existing) location of Rasor Road.
Utilities	
33	The non-conductive fiber optic communications cable shall be co-located with the low-voltage DC and AC wiring, where feasible, to minimize environmental impacts associated with trenching.
Vegetation Resources	
34	The site shall be revegetated after decommissioning according to the Final Closure Plan prepared in conformance with BLM requirements at the time of decommissioning.
35	**Preconstruction Surveys for Rare or Special-Status Plant Species and Cacti**. Before construction of a given phase begins, the Applicant will stake and flag the construction area boundaries, including the construction areas for the solar arrays and associated infrastructure; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A BLM-approved biologist will then survey all areas of proposed ground disturbance for rare or special-status plant species and cacti during the appropriate period (blooming or otherwise identifiable) for those species having the potential to occur in the construction areas. All rare or special-status plant species and cacti observed will be flagged for transplantation.
36	**Vegetation Resources Management Plan**. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components: • Vegetation Salvage plans that discuss the methods that will be used to transplant cacti present within the proposed disturbance areas following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur within proposed disturbance areas. • Restoration plans discussing the methods that will be used to restore any of the four native plant community types (creosote bush-white bursage scrub, cheesebush scrub, creosote bush scrub, and smoke tree woodland) present within the Project right-of-way that may be temporarily disturbed by construction activities. • Vegetation Salvage and Restoration plans that will specify success criteria and performance standards. The Applicant will be responsible for implementing the VRMP according to BLM requirements.
37	**Mitigate Direct Impacts to Rare or Special-status Plants.** To the extent feasible, the Project will be designed to avoid impacts to the Emory's crucifixion-thorn population within the project ROW. No construction shall be allowed within a 100-foot buffer area around the Emory's crucifixion-thorn population. All other California Rare Plant Rank (CRPR) 1 and 2 plant occurrences within the Project ROW will be documented during preconstruction surveys. The Applicant will also provide a 100-foot buffer area surrounding each avoided occurrence, in which no construction activities will take place, if feasible. If avoidance is not feasible, the Applicant will provide on-site mitigation (e.g., vegetation salvage) for impacts to rare plants.

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Weed Management	
38	• Herbicides shall not be applied systemically over the entire project area. Herbicides shall be applied in focused treatments in areas where invasive weed infestations have been identified, such as where there is a clump or monotypic stand of invasive weeds. • Herbicides shall not be applied within 100 feet of a special-status plant.
39	Only a State of California and Federally certified contractor (i.e., Qualified Applicator), who is also approved by BLM, will be permitted to perform herbicide applications. Herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow EPA label instructions.
40	Herbicides shall not be applied during rain events, or within 48 hours of a forecast rain event with a 50 percent or greater chance of precipitation.
41	Herbicide storage containers shall be disposed of in a landfill that is approved for pesticide disposal.
Visual Resources	
42	Where appropriate, a paint color acceptable to BLM shall be used on project buildings to minimize visual contrast with the existing setting.
43	Lighting on the project site shall be dark sky-compliant. Lighting shall be limited to areas required for operations or safety, directed on site to avoid backscatter, and shielded from public view to the extent practical. Lighting that is not required during nighttime hours shall be controlled with sensors or switches operated such that lighting will be on only when needed.
Wildlife Resources	
44	The Applicant will implement a Worker Environmental Awareness Program (WEAP) to educate workers about the environmental issues associated with the project and the mitigation measures that will be implemented at the site, including nest awareness and non-disturbance exclusion zones.
45	Burrowing owls occupying burrows on site will be passively relocated outside the nesting season or after a qualified biologist determines that the burrow does not contain eggs or chicks and after consultation with CDFW. Prior to construction and passive relocation, artificial burrows will be installed in areas that would not be disturbed during construction at a ratio of 5:1 for each burrow that will be destroyed by project construction. Passive relocation will be conducted prior to construction and according to the California Burrowing Owl Consortium (CBOC) Guidelines (1993).
46	Pre-construction clearance surveys to identify active bird nests will be conducted within 2 weeks of ground disturbance or vegetation removal in all active work areas during the breeding season (February 1 through August 31). The work area will need to be resurveyed following periods of inactivity of 2 weeks or more. Active nests will be avoided using non-disturbance buffer zones as shown below.

Type	Starting Distance of Awareness or Non-Disturbance Exclusion Zones	Implementation Notes
Passerines	300 feet from active nest	A qualified biologist may reduce or increase the buffer distance if there is sufficient evidence based on species, habitat, and other factors, that Applicant activity would not impact nesting activity. Buffers would be maintained until a qualified biologist has determined that the nest is no longer active.
Raptors	500 feet from active nest	
Golden Eagles	1 mile and line of sight from active nest	
Burrowing Owls[1]	250 feet from active burrows during nesting season (February 1 through August 31)	
	160 feet from active burrows during the wintering period (September 1 through January 31)	

NOTE:
[1] Described in CBOC, 1993

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Wildlife Resources (cont.)	
47	A qualified biologist will monitor active bird nests or burrows that are located in or adjacent to work areas during the avian breeding season until nesting activities are complete. Nest monitoring results will be recorded in a Nest Check Form. Typically a nest check will involve a minimum observation duration of 30 minutes, but may be longer or shorter, or more frequent than one check per day, as determined by the Project's Designated Biologist [See Mitigation Measure 3.3-1 in Section 3.3, *Biological Resources – Vegetation*] based on the type of construction activity (duration, equipment being used, potential for construction-related disturbance) and other factors related to assessment of nest disturbance (weather variations, pair behavior, nest stage, nest type, species, etc.). The Designated Biologist will record the construction activity occurring at the time of the nest check and note any work exclusion buffer in effect at the time of the nest check. Non-Project activities in the area should also be recorded (e.g., adjacent construction sites, roads, commercial/industrial activities, recreational use, etc.). The Designated Biologist will record any sign of disturbance to the active nest, including but not limited to parental alarm calls, agitated behavior, distraction displays, nest fleeing and returning, chicks falling out of the nest or chicks or eggs being predated as a result of parental abandonment of the nest. Should the Designated Biologist determine project activities are causing or contributing to nest disturbance that might lead to nest failure, the Designated Biologist will coordinate with the Construction Manager to limit the duration or location of work, and/or set other limits related to use of project vehicles, and/or heavy equipment. Nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas will be described and reported in regular monitoring and compliance reports.
48	Preconstruction surveys for burrows containing suitable bat roosting habitat that could be used as individual bat roosts will be conducted in all project work areas.
49	The connection from the substation to the transmission line will be designed to meet the most recent Avian Power Line Interaction Committee (APLIC) guidelines to the extent practicable.
50	The Applicant will implement an Integrated Weed Management Plan to control weed infestations and the spread of noxious weeds on the project site.
51	Fencing will use USFWS or similar wildlife- compatible design standards.
52	Collector lines will be placed underground to reduce avian collisions.
53	After project construction, areas of temporary disturbance will be restored using the restoration measures in the Vegetation Resource Management Plan will be implemented.
54	Federal and state measures for handling toxic substances will be followed to minimize danger from spills to water and wildlife resources. Facility operators shall maintain Hazardous Materials Spill Kits on site and train personnel in the use of these kits.
55	The Applicant will clear vegetation outside of the bird breeding season to the maximum extent practicable. Preconstruction avian clearance surveys will be conducted by a qualified biologist for vegetation clearing during the bird breeding season (February 1 through August 31). If a nest(s) is identified in the preconstruction avian clearance surveys, a qualified monitor will be on site during vegetation removal in order to enforce non-disturbance buffers and stop activities as necessary should construction disturb nesting activity.
56	Trash will be disposed of in covered containers and regularly removed from the site.
57	Surveys for burrowing owl will be conducted in suitable burrowing owl habitat prior to construction and if construction is suspended for 2 weeks or more. The survey protocol will follow the Burrowing Owl Consortium Guidelines (CBOC, 1993). If active burrows are found they will be avoided using non-disturbance buffer zones, as described in the table included in APM 46. Passive relocation would be used as described above once the burrow is determined to be inactive.
58	A qualified biologist will conduct a golden eagle clearance survey for a 4-mile area surrounding the project. Golden eagle clearance surveys will be conducted annually for each year of construction during the golden eagle nesting season. If active nests are found in the survey area, the Applicant will coordinate with BLM, USFWS, and CDFW to ensure that construction does not result in disturbance of this species.
59	Evaporation ponds will have 3:1 sloping sides to discourage wading birds from utilizing the ponds. A wire grid with visual deterrents, such as plastic colored ribbons, will be installed to discourage birds and bats from landing on the ponds. The evaporation pond will be monitored for bird fatalities. Netting or other appropriate BMPs will be applied at the direction of the Designated Biologist and as approved by BLM, CDFW, and USFWS (as appropriate).

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Wildlife Resources (cont.)	
60	The Applicant and its contractors will remove and dispose of road kill near the Project site to avoid attracting raptors and other scavengers to the site, and will regularly remove vegetation around larger facilities (such as the substation) to reduce raptor foraging.
61	The Project will minimize the use of lighting that could attract migrating birds and bats (that feed on concentrations of insects at lights). Lighting will be kept to the minimum level necessary for safety and security. High intensity, steady burning, bright lights such as sodium vapor or spotlights will not be used on project facilities.
62	Project personnel and visitors will be instructed to drive at low speeds (<15 mph) and be alert for wildlife, especially in low-visibility conditions.
63	Decommissioning methods will minimize new site disturbance and removal of native vegetation to the extent feasible.
64	Foundations will be removed to a minimum of three feet below surrounding grade during decommissioning, and covered with soil to allow adequate root penetration for native plants. Petroleum product leaks and chemical releases shall be remediated prior to completion of decommissioning.
65	Fencing will be removed at the completion of decommissioning.
66	Desert tortoise exclusion fencing will be installed at the perimeter of project construction areas (i.e., solar array areas, project buildings, substation/switchyard, earthen berms, and along the edge of access roads and collector line corridors). The fence locations will be determined during final design and will enclose areas of project activity. The fenceline and a 30-foot-wide buffer will be surveyed for desert tortoise before construction of the fence and according to USFWS protocol. Tortoises found in the fenceline survey area or spotted within 50 meters of the fenceline survey area will be: • Assigned a USFWS identification number. • Given a health assessment • Fitted with a transmitter. Tortoises that are too small to accept a transmitter (i.e., no transmitter is available that is 10 percent or less of the tortoise's body weight) will be treated as a translocatee and held in situ. • Moved into habitat adjacent to and outside the fenceline. The tortoise will be moved into an empty burrow if clearance of the fence area takes place outside the tortoise active season (i.e., from November to March and from June to August). Any of the moved tortoises that return to the project site before completion of fence construction will be treated as a translocatee. Desert tortoises remaining outside the fenceline prior to completion of the fence will be deemed residents. The transmitter will be removed from the resident tortoise, and no further action will be taken for the resident tortoises. In all situations USFWS procedures will be followed to clear and handle desert tortoises.
67	The desert tortoise preconstruction clearance survey will be conducted during the desert tortoise active season (April through May and September through October) unless otherwise agreed to by USFWS and CDFW. The survey will be conducted according to USFWS protocol and preferably during early morning hours to increase the chance of locating juvenile tortoises, per the USFWS Guidelines. Any tortoise scat will be collected on each pass of a transect, per the USFWS Guidelines.
68	The linear facilities preconstruction clearance survey(s) will be conducted at any time throughout the year. Linear facilities for this project will include the buried collector lines between arrays and connecting to the substation. Located desert tortoises will be undisturbed and allowed to clear the site without assistance or interference. Tortoises will be moved if necessary to reduce the potential for harm from construction activities, but will not be moved more than 500 meters in such a scenario. In all situations USFWS procedures will be followed to clear and handle desert tortoises.
69	Data will be collected during clearance surveys as described in this section. The same data will be collected again on tortoises held in the interim in situ on the day that the tortoise is translocated from the project site. The data will include: • Date • Time • Temperature (°C) • Project Name • Site type (project/recipient/control) • Landowner (BLM) • Permit/BO # • Coverage # • Field crew vendor • Surveyor (first and last name) • ID#MCL (mm) • Sex • UTM (Easting) • UTM (Northing • Location (e.g., burrow) • Transmitter manufacturer • Transmitter serial # • Transmitter frequency • Transmitter install date • Battery life (months) • Status (alive/dead/lost)

TABLE 2-5 (Continued)
APPLICANT PROPOSED MEASURES

APM No.	APM Description
Wildlife Resources (cont.)	
70	Following installation of the desert tortoise exclusion fencing, the fencing shall be regularly inspected. Permanent fencing shall be inspected weekly and during/within 24 hours following all major rainfall events and all federal holidays. A major rainfall event is defined as one for which flow is visibly detectable within the fenced drainage. During construction, repairs to fencing will be completed within 24 hours of detecting a breach. During operation, any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 72 hours between March 15 and October 31 and within 7 days between November 1 and March 14 of observing damage. Inspection reports will be submitted to BLM within 48 hours of any inspection.
71	No construction, operation, or decommissioning activities involving earthwork shall occur in unfenced areas without an USFWS-approved desert tortoise biologist present. These activities include the construction phase (construction, revegetation), decommissioning phase, and maintenance activities during the operation phase that require new surface disturbance. An adequate number of trained and experienced monitors must be present during all construction and decommissioning activities in unfenced areas, depending on the various construction tasks, locations, and season. The approved biologist shall be on site from April 1 through May 31 and from September 1 through October 31 (active season) during ground-disturbing activities in areas outside the exclusion fencing, and shall be on-call from November 1 to March 14 (inactive season). The biologist shall check all construction areas immediately before construction activities begin. The biologist shall inspect construction pipes, culverts, or similar structures: (a) with a diameter greater than 3 inches, (b) stored for one or more nights, (c) less than 8 inches aboveground, and (d) within desert tortoise habitat (i.e., outside the permanently fenced area), before the materials are moved, buried, or capped. Alternatively, such materials may be capped before storing outside the fenced area or placing on pipe racks.
72	A Raven Monitoring and Control Plan shall be prepared consistent with the most current USFWS-approved raven management guidelines. The purpose of the plan is to avoid any project-related increases in raven numbers during construction, operation, and decommissioning. The Raven Monitoring and Control Plan shall be submitted to BLM and CDFW for approval at least 30 days prior to the start of construction.
73	Compensatory habitat mitigation shall be provided at a 1:1 ratio for impacts to suitable desert tortoise habitat during construction. A habitat compensation plan will be prepared to the approval of CDFW, USFWS, and BLM.
74	No pets shall be allowed on site prior to or during construction, except kit fox scat detection dogs (with CDFW approval) used for preconstruction surveys.
75	Two water sources will be created to encourage bighorn sheep migration to the north of I-15. The water source locations shall be determined through coordination with CDFW and BLM. The water source shall be maintained throughout the life of the project.

2.5 Action Alternatives

Alternatives B, C, and D are the same as the Proposed Action (Alternative A) except as described below. For each of these action alternatives, a CDCA Plan amendment would be required.

2.5.1 Alternative B

The components and configuration of Alternative B are shown in Figure 2-5. Alternative B consists of the East Array (comprising two sub-arrays, East 1 and East 2) and the South Array (consisting of three sub-arrays, South 1, South 2, and South 3) as described for the Proposed Action; no North Array would be constructed. The substation and switchyard would be constructed in the same location as the Proposed Action, except that no collector lines would feed into the substation from the north. Only the collector lines from the East and South arrays, combined into a single route before crossing I-15, would feed into the substation. The operation and maintenance area buildings

and brine ponds would be located and constructed as described for the Proposed Action. The northernmost proposed groundwater well (well W-1) would not be constructed under Alternative B. Primary site access to Alternative B would be via an alternative realignment of Rasor Road shown on Figure 2-5. Access to the substation would be provided in the same manner as the Proposed Action, i.e., via Zzyzx Road and Blue Bell Mine Road.

The maximum solar energy generating capacity of Alternative B is estimated to be approximately 264 MW. As shown in Table 2-6, the estimated total area of temporary and permanent disturbance would be less than that of the Proposed Action.

TABLE 2-6
ALTERNATIVE B ESTIMATED TEMPORARY AND PERMANENT SURFACE DISTURBANCE

Project Component	Temporary Area of Disturbance (acres)	Permanent Area of Disturbance (acres)	Total Area of Disturbance (acres)
Solar Arrays[2]	52	1,594	1,646
Substation, Switchyard, and Interconnection	25	15	40
Rasor Road Realignment	66	16	82
Access Roads	52	5	57
Berms	11	17	28
Collector Routes	24	0[3]	24
Laydown Area	30	0[3]	30
Temporary Desert Tortoise Exclusion Fence	16	0[3]	16
Total	**276**	**1,647**	**1,923**

NOTE:
1 California Department of Fish and Wildlife (CDFW) consider all areas of temporary impacts to be permanent in the desert.
2 Solar array permanent disturbance is calculated as all areas within the solar array fence. Solar array temporary disturbance includes areas within the desert tortoise exclusion fence and a work area 30 feet from the desert tortoise exclusion fence, excluding other Project components. Project Components included within the solar array security fence include the operation and maintenance buildings, warehouses, water tanks, wells, water treatment facility, and brine ponds. Impacts for these components are accounted for in the impacts for the solar arrays
3 Areas would be reclaimed after construction.

Construction of Alternative B is estimated to be phased over approximately 18 to 22 months. Daily water consumption during construction would be approximately the same as the Proposed Action (200,000 gpd), resulting in a total of 283 to 354 AF throughout the construction period.

During operation and maintenance, Alternative B would require 4 AFY for panel washing and 19 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the same as for the Proposed Action, resulting in a total consumption of approximately 25 AFY for all uses throughout operation and maintenance.

2.5.2 Alternative C

The components and configuration of Alternative C are shown in Figure 2-6. Alternative C consists of the North Array and South Array (consisting of three sub-arrays, South 1, South 2, and South 3), as described for the Proposed Action; the East Array would not be constructed. The substation and switchyard would be constructed in the same location as the Proposed Action;

however, no collector line would be constructed from the East Array. The operation and maintenance area buildings and brine ponds would be located and constructed as described for the Proposed Action. The groundwater wells would be located and constructed as described for the Proposed Action except that groundwater well W-3 would not be constructed. Access to the South Array could be provided either via the Proposed Action realignment of Rasor Road or the Alternative B realignment of Rasor Road; the analysis of Alternative C in Chapter 3 assumes that the Proposed Action realignment would be used. However, the BLM may choose to approve Alternative C with the Alternative B Rasor Road realignment based on the analysis in the PA/EIS/EIR.

The maximum solar energy generating capacity of this alternative would be 298 MW. As shown in Table 2-7, the estimated temporary and permanent disturbance would be less than that of the Proposed Action.

TABLE 2-7
ALTERNATIVE C ESTIMATED TEMPORARY AND PERMANENT SURFACE DISTURBANCE

Project Component	Temporary Area of Disturbance (acres)	Permanent Area of Disturbance (acres)	Total Area of Disturbance (acres)
Solar Arrays[2]	49	1,768	1,817
Substation, Switchyard, and Interconnection	25	15	40
Rasor Road Realignment	55	13	68
Access Roads	75	7	82
Berms	13	20	33
Collector Routes	20	0[3]	20
Laydown Area	30	0[3]	30
Temporary Desert Tortoise Exclusion Fence	34	0[3]	34
TOTAL	**30**	**1,823**	**2,124**

NOTE:
1 California Department of Fish and Wildlife (CDFW) consider all areas of temporary impacts to be permanent in the desert.
2 Solar array permanent disturbance is calculated as all areas within the solar array fence. Solar array temporary disturbance includes areas within the desert tortoise exclusion fence and a work area 30 feet from the desert tortoise exclusion fence, excluding other Project components. Project Components included within the solar array security fence include the operation and maintenance buildings, warehouses, water tanks, wells, water treatment facility, and brine ponds. Impacts for these components are accounted for in the impacts for the solar arrays
3 Areas would be reclaimed after construction.

Construction of Alternative C is estimated to be phased over approximately 20 to 25 months. Daily water consumption during construction would be approximately the same as the Proposed Action, resulting in a total of 320 to 400 AF throughout the construction period.

During operation and maintenance, Alternative C would require 4.5 AFY for panel washing and 22 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the same as for the Proposed Action, resulting in a total consumption of approximately 28 AFY for all uses throughout operation and maintenance.

2.5.3 Alternative D

The components and configuration of Alternative D are shown in Figure 2-7. Alternative D comprises the North Array as described for the Proposed Action, the East Array, comprising two sub-arrays, East 1 and East 2 and a reduced South Array. Under this Alternative the South array would consist of only two sub-arrays, South 1 and South 2. A third sub-array described in the Proposed Action, South 3, would not be constructed under Alternative D. East 1 and South 2 arrays would also be reduced in size. The substation and switchyard would be constructed in the same location as the Proposed Action; however, no collector line would be constructed from South Array 3. The operation and maintenance area buildings and brine ponds would be constructed within the footprint of the reduced South Array, located at the intersection of Rasor Road and Arrowhead Highway. The groundwater wells would be located and constructed as described under the Proposed Action. Under Alternative D, no realignment of Rasor Road would occur. Instead, the existing Rasor Road (a BLM-designated open route) would be used for site access on the southeast side of I-15 including any necessary road maintenance. Access to the north side of I-15 would be provided as under the Proposed Action.

The maximum solar energy generating capacity of this alternative would be 250 MW. As shown in Table 2-8, the estimated temporary and permanent disturbance would be less than that of the Proposed Action.

TABLE 2-8
ALTERNATIVE D ESTIMATED TEMPORARY AND PERMANENT SURFACE DISTURBANCE

Project Component	Temporary Area of Disturbance (acres)	Permanent Area of Disturbance (acres)	Total Area of Disturbance (acres)
Solar Arrays[2]	45	1,679	1,724
Substation, Switchyard, and Interconnection	25	15	40
Rasor Road Realignment (n/a)	0	0	0
Access Roads	84	8	92
Berms	9	15	24
Collector Routes	22	0[3]	22
Laydown Area	30	0[3]	30
Temporary Desert Tortoise Exclusion Fence	39	0[3]	39
TOTAL	**254**	**1,717**	**1,971**

NOTE:
1 California Department of Fish and Wildlife (CDFW) consider all areas of temporary impacts to be permanent in the desert.
2 Solar array permanent disturbance is calculated as all areas within the solar array fence. Solar array temporary disturbance includes areas within the desert tortoise exclusion fence and a work area 30 feet from the desert tortoise exclusion fence, excluding other Project components. Project Components included within the solar array security fence include the operation and maintenance buildings, warehouses, water tanks, wells, water treatment facility, and brine ponds. Impacts for these components are accounted for in the impacts for the solar arrays
3 Areas would be reclaimed after construction.

Construction of Alternative D is estimated to be phased over approximately 17 to 21 months. Daily water consumption during construction would be approximately the same as the Proposed Action, resulting in a total of 268 to 335 AF throughout the construction period.

During operation and maintenance, Alternative D would require 3.8 AFY for panel washing and 18 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the same as for the Proposed Action, resulting in a total consumption of approximately 24 AFY for all uses throughout operation and maintenance.

2.6 No Action/No Project Alternatives

2.6.1 Alternative E

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. Because the Project would not be approved, no new structures or facilities would be constructed, operated, maintained, or decommissioned on the site, and no related ground disturbance or other Project impacts would occur. The BLM would continue to manage the land consistent with the site's multiple use classification as described in the CDCA Plan. Based on the CDCA Plan amendments made in the Solar PEIS ROD, for future applications the site would be identified primarily as variance areas open to future applications for solar development, subject to the procedures identified in the Solar PEIS, and some exclusion areas in the southeast portion of the site that would be closed to such applications. In the case of variance areas, future projects would still require a CDCA Plan Amendment to move forward. These projects would be subject to applicable laws and land use plans.

2.6.2 Alternative F

Alternative F describes the scenario that could result if the BLM were to authorize the requested ROW grant under the Proposed Action (Alternative A) or Alternative B, C, or D and amend the CDCA Plan to identify the Project site as suitable for the proposed use, and the County were to deny the requested groundwater well permit application (i.e., select Alternative E). In this event, a PV solar energy facility and related infrastructure could be developed on the site but would require an off-site source of water for potable use, dust control, panel washing, and fire protection. Under these circumstances, the following activities could occur:

1. During construction, up to 30 truck trips (60 one-way trips) per day would be needed to deliver up to 300,000 gpd to the site (Soda Mountain Solar, LLC, 2013a; Pan Environmental, Inc., 2013).

2. During operation and maintenance, up to 1,330 gpd would be required for potable use. This alternative is not likely to result in a change in the proposed water storage tanks that would be constructed on site; therefore, one truck trip (two one-way trips) would be needed every 3 to 4 days to refill the 5,000-gallon potable water storage tank. During panel washing, up to three truck trips (six one-way trips) per day would be required to deliver up to 14,700 gpd to the site for a maximum of 120 days per year of panel washing. These truck trips could be grouped to refill the 42,000-gallon panel washing water storage tank every

2 to 3 days. Additionally, water would need to be delivered to the site periodically (as needed) to refill the 22,500-gallon storage tank for fire suppression water, as well as to refill the panel washing water storage tank outside of the twice-yearly panel washing periods, as needed for dust control (up to 26 AFY or 23,200 gpd).

3. During decommissioning, water needs would be similar to construction. The amounts of water delivered and associated truck trips would be reduced if Alternative B, C, or D is approved, as described for those alternatives in Section 2.4.

2.6.3 Alternative G

Under Alternative G the BLM would not authorize a ROW grant for the Project and would amend the CDCA Plan to identify the site (as depicted in Figure 2-1) as unsuitable for a utility-scale solar development; and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. Because the Project would not be approved, no new structures or facilities would be constructed, operated, maintained, or decommissioned on the site, and no related ground disturbance or other Project impacts would occur. The BLM would continue to manage the land consistent with the site's multiple use classification as described in the CDCA Plan with the exception that solar development would be precluded on the site.

2.7 Federal Lead Agency Preferred Alternative/CEQA Environmentally Superior Alternative

Under NEPA, the "preferred alternative" is a preliminary indication of the Lead Agency's preference of action among the Proposed Action and alternatives. A NEPA Lead Agency may select a preferred alternative for a variety of reasons, including the agency's priorities, in addition to the environmental considerations discussed in the EIS. In accordance with NEPA (40 CFR 1502.14(e)), the BLM preliminarily has identified Alternative A, the Proposed Action, as the preferred alternative.

CEQA Guidelines Section 15126.6(e)(2) requires an EIR to identify an environmentally superior alternative. If the environmentally superior alternative is the No Project Alternative, the EIR also must identify an environmentally superior alternative from among the other alternatives. In general, the environmentally superior alternative is defined as that alternative with the least adverse impacts to the project area and its surrounding environment.

CEQA Guidelines Section 15126.6(e)(2) requires an EIR to identify an environmentally superior alternative. If the environmentally superior alternative is the No Project Alternative, the EIR also must identify an environmentally superior alternative from among the other alternatives. In general, the environmentally superior alternative is defined as that alternative with the least adverse impacts to the project area and its surrounding environment.

The No Action/No Project alternative (Alternative E) would avoid all impacts of the Project and would not create any new significant impacts of its own. However, as noted in Section 3.5, Alternative E would not offset greenhouse gas emissions associated with fossil fuel electricity generation. The CEQA Guidelines define the environmentally superior alternative as that alternative with the least adverse impacts to the project area and its surrounding environment; therefore, Alternative E is considered the environmentally superior alternative for CEQA purposes because it would not create any of the localized impacts of the Project, even though would have a less beneficial impact than that of the Project on greenhouse gases. Alternative E would fail to meet the basic objectives of the Project set forth in Section 1.2.2 of constructing, operating, maintaining, and decommissioning a cost-efficient, environmentally sound solar-powered generating facility on lands that meet fundamental tehcnical requirements, including close proximity to transmission infrastructure.

Determining an environmentally superior alternative is difficult because of the many factors that must be balanced. Although this Draft PA/EIS/EIR preliminarily identifies an environmentally superior alternative, it is possible that, with additional information received in or developed in response to comments, the County could choose to balance the importance of each impact area differently or reach a different conclusion during the project approval process. The County preliminarily has identified Alternative B (including approval of a groundwater well permit) as the environmentally superior alternative because it would result in 575 fewer acres of permanent disturbance and 59 fewer acres of temporary disturbance compared to the Proposed Action, and would disturb the fewest acres among Alternatives A, B, C, or D. Additionally, Alternative B would result in the fewest acres of waters of the State disturbed among these action alternatives. Alternative F is not preliminarily identified as the environmentally superior alternative because while it would avoid potential less-than-significant impacts on tui chub and groundwater supplies, it would exacerbate the significant and unavoidable impact related to criteria air pollutant emissions.

2.8 Alternatives Considered but Eliminated from Detailed Analysis

In accordance with 43 CFR 2804.10, the BLM worked closely with the Applicant during the pre-application phase to identify appropriate locations and configurations for the Project. The BLM discouraged the Applicant from including in its application alternate BLM locations with significant environmental concerns, such as critical habitat, ACECs, DWMAs, designated off-highway vehicle (OHV) areas, wilderness study areas, and designated wilderness areas. The BLM encouraged the Applicant to locate its project on public lands with few potential conflicts. Other alternative sites, technologies, and methods were considered but eliminated from detailed analysis based on the screening factors outlined in Section 2.2 above.

Alternative sites, technologies, and methods were considered as alternatives to the Project but not carried forward for detailed analysis. Each is discussed below.

2.8.1 Site Alternatives

Potential site alternatives to the Project were considered but not carried forward for detailed analysis as described below.

2.8.1.1 BLM-administered Public Land Alternatives

The Applicant initially reviewed more than 20 sites on BLM-administered public land in southern California, seeking a suitable site with high solar insolation, access to highways, proximity to electric transmission lines, and relatively flat slope (less than 5 percent). Site visits and other additional investigation resulted in the elimination of 15 sites that were subject to prior pending ROW grant applications or infeasible due to insufficient size, distance to transmission, greater slopes, access limitations, and other factors. An additional four of the five remaining sites[4] were rejected from further consideration because they were located in DWMAs designated to protect desert tortoise (Soda Mountain Solar, LLC, 2013b).

These potential site alternatives would have responded to the BLM's purpose and need, which as stated in Section 1.2.1 is to respond to the Applicant's application under Title V of the FLPMA for a ROW grant to construct, operate, maintain, and decommission a solar photovoltaic (PV) facility on public lands in compliance with FLPMA, BLM ROW regulations, applicable federal laws, and management and policy objectives. However, these potential site alternatives were rejected from detailed review because they were not within close proximity to transmission infrastructure, could not be implemented feasibly for technical or other reasons, their development for solar use would have been inconsistent with the basic policy objectives for the management of the area, and their implementation would not avoid or substantially lessen any significant effects of the Project.

2.8.1.2 Private Land Alternatives

The Applicant examined 4,853,760 acres of lands within 50 miles of the proposed ROW to determine whether a suitable private site could be found for the Project. The Applicant sought lands of sufficient size, contiguity, and proximity to adequate transmission lines to support the Project and identified two potential sites with over 2,500 contiguous acres of private land in close proximity to a transmission line: one consisting of approximately 12,020 contiguous acres (the "West Site"), the other consisting of approximately 3,262 contiguous acres (the "East Site"). The West Site and East Site are shown on Figure 2-8.

These potential site alternatives would not have met the BLM's purpose and need to respond to the Applicant's application under Title V for a ROW grant under the authorities and for the purposes described above. In addition, the Applicant also rejected these sites based on environmental resource constraints that would have limited the area available for development such that it was too small to meet the Applicant's objectives for the Project, and because implementation of these site alternatives would not avoid or substantially lessen any significant effects of the Project. To the contrary, it appears that the development of either site could cause

4 The fifth site screened became Alternative A.

greater impacts to biological resources than the Proposed Action due to their proximity to the Mojave River wildlife linkage corridor, Superior-Cronese DWMA (USFWS-designated critical habitat for desert tortoise), Afton Canyon Area of Critical Environmental Concern (ACEC). Further, the number of individual landowners and lack of sales and lease offerings would make aggregation of the necessary separate parcels infeasible. (Soda Mountain Solar, LLC, 2013b). The Lead Agencies have reviewed and agree with the Applicant's conclusions regarding the West Site and East Site.

2.8.1.3 Brownfields / Degraded Lands Alternative

The USEPA tracks 480,000 contaminated sites for potential reuse for renewable energy development as part of its RE-Powering America's Lands Initiative. Of these sites, USEPA has identified 5,000 sites nationwide as potentially suitable for PV (Paull, 2010). Using the USEPA's Renewable Energy Interactive Mapping Tool, a Google Earth .KMZ file, it is possible to view information about potential utility scale PV solar energy sites on contaminated lands. In addition to the contaminated site's location, the tool also provides the site name and identification information, a link to the site's cleanup status information, and specific acreage and renewable energy resource information (USEPA, 2013a). Using the tool to select USEPA-tracked sites (i.e., abandoned mined lands, brownfields, RCRA sites, federal and non-federal Superfund sites, and landfills) as well as state-tracked sites, only one location with PV solar power potential was identified along the I-15 corridor between Barstow and Las Vegas (USEPA, 2013b): the Baker Refuse Disposal Site (USEPA, 2013c). The Baker Refuse Disposal Site is a 10-acre USEPA-tracked landfill located near Baker, California, and approximately 5 miles from SCE's Marketplace-Adelanto line, which is the nearest transmission line to the site (USEPA, 2013c). Although it has "excellent" utility solar potential, this site is not large enough to accommodate any of the action alternatives. The Applicant considered two other potential landfill sites: the approximately 46-acre Teapot Dome site and the approximately 29-acre Tecopa Disposal Site, each of which is located 30 miles from the Marketplace-Adelanto line (Soda Mountain Solar, LLC, 2013b). Similar to the Baker Refuse Disposal Site, neither of these other landfill sites is of sufficient size to accommodate any of the action alternatives.

Supplementing USEPA's RE-Powering America's Lands Initiative, USEPA and the National Renewable Energy Laboratory (NREL) have developed a Google Earth .KMZ file and data set that illustrate approximately 11,000 contaminated and degraded public and private sites in California that could be candidates for renewable energy development (USEPA and NREL, 2013a). This tool includes additional California sites and uses a screening tool to filter and suggest sites as the best for utility-scale renewable energy development based on the various renewable energy technologies and associated screening criteria developed by USEPA and NREL. Current and former Superfund sites, mine sites, and other "brownfield" locations are identified. Of the approximately 11,000 sites, no potential utility-scale PV solar sites are identified along I-15 between Barstow and Las Vegas (USEPA and NREL, 2013b). The Applicant initially considered the National Training Center at Fort Irwin, which includes 14 separate RCRA units but the RCRA site is not large enough to accommodate any of the action alternatives and at 20 miles distance from the nearest transmission line, is not sufficiently proximate to meet the Project needs and objectives identified in Section 1.2.2 (Soda Mountain Solar, LLC, 2013b). The

Barstow Marine Corps Logistics base includes a RCRA site and a Superfund site; however, the size of the contaminated areas is too small to accommodate any of the action alternatives. Further, environmental constraints including proximity to the Ord-Rodman Mountain DWMA, Mojave Monkeyflower ACEC, desert tortoise critical habitat, and Mojave River and wildlife linkage corridor, among others (Soda Mountain Solar, LLC, 2013b), make it unlikely that implementation of an alternative on this site would avoid or substantially lessen any significant effects of the Project.

2.8.2 Other Types of Renewable Energy Projects

Other types of renewable energy projects, including wind, geothermal and other solar technologies, were rejected from detailed consideration because they would not meet the BLM's purpose and need to respond to the Applicant's application under Title V of the FLPMA for a ROW grant to construct, operate, maintain, and decommission a solar photovoltaic (PV) facility on public lands.

Distributed generation solar also was rejected from detailed consideration. Distributed generation refers to the installation of small-scale solar energy facilities at individual locations at or near the point of consumption (e.g., use of solar PV panels on a business or home to generate electricity for on-site consumption). Distributed generation systems typically generate less than 10 MW. To be a viable alternative to the Project, there would have to be sufficient newly installed solar panels to generate 358 MW of capacity, approximately the equivalent of 36 typical systems. The rate of PV manufacturing and installation is expected to continue to grow and larger distributed solar PV installations are becoming more common. California has approximately 3,700 MW of distributed solar generation in operation and an additional 4,200 MW under construction. However, in addition to planning and permitting barriers for distributed generation, replacing the action alternatives with a distributed generation solar energy alternative would be speculative based on existing limitations on the integration of distributed generation into the electric grid, expense, and the lack of electricity storage in most systems (California Office of the Governor, 2012). Therefore, an alternative involving distributed generation was eliminated from detailed analysis because it would not respond to the BLM's purpose and need for the Proposed Action, which is to respond to the Applicant's application for a ROW grant to construct, operate, and decommission a solar PV facility on public lands in compliance with FLPMA, BLM ROW regulations, and other federal applicable. Furthermore, the BLM has no authority or influence over the installation of distributed generation systems, other than lands that it administers.

2.8.3 Conservation and Demand Side Management

This potential alternative to utility-scale solar PV energy development consists of a variety of approaches to reduce electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. With population growth and increasing demand for energy, conservation and demand-management alone is not sufficient to address all of California's energy needs. These efforts also do not respond to federal mandates to promote, expedite, and advance the production and transmission of environmentally sound energy resources, including renewable energy resources and in particular, cost-competitive solar energy

systems at the utility scale. Accordingly, this potential alternative was rejected from detailed consideration. Conservation and demand side management approaches also were rejected from detailed consideration because they would not meet the BLM's purpose and need to respond to the Applicant's application under Title V of the FLPMA for a ROW grant to construct, operate, maintain, and decommission a solar PV facility on public lands. Furthermore, the BLM has no authority or influence over the installation of distributed generation systems, other than on lands that it administers.

References

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended through 1999.

BLM, 2007. Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement.

Caithness Soda Mountain, LLC, 2011. Hydrogeologic Conditions and Groundwater Modeling Report, Soda Mountain Solar Project.

California Burrowing Owl Consortium (CBOC), 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. [http://www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf]

California Department of Water Resources (DWR), 2003. California Groundwater Bulletin #118. [http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf]

California Office of the Governor, 2012. California's Climate Goals, Large Scale Renewable Energy, and the DRECP. [http://www.drecp.org/meetings/2012-04-25-26_meeting/presentations/04_Office_of_the_Governor_Paper.pdf]

Diaz Yourman & Associates, 2010. Preliminary Geotechnical Investigation (Phase 1A) Report Caithness Soda Mountain Solar Facility Project Baker, San Bernardino County, California. Prepared for RMT, Inc. and Caithness Soda Mountain, LLC. December.

Pan Environmental, Inc., 2013. Final Air Quality and Greenhouse Gas Impact Analysis Soda Mountain Solar Project, May.

Panorama Environmental, Inc., 2012. Groundwater Well Permit Application, Soda Mountain Solar Project, San Bernardino County, California. September.

Panorama Environmental, Inc., 2013. Soda Mountain Solar Grading Areas.

Paull, 2010. Brownfields and Green Jobs [A presentation of Evans Paull, Redevelopment Economics, at the 2010 West Virginia Brownfields Conference: Perspectives of Potential]. [http://www.wvbrownfields.org/conferences/2010/presentations/Evans%20Paul%20-%20Jobs.pdf]

RMT, Inc., 2011a. Plan of Development Soda Mountain Solar Project, BLM Case Number - CACA49584. March. Prepared for Caithness Soda Mountain, LLC.

RMT, Inc., 2011b. Hydrogeologic Conditions and Groundwater Modeling Report. March. Prepared for Caithness Soda Mountain, LLC.

Soda Mountain Solar, LLC, 2013a. Soda Mountain Solar Project Revisions to March 2011 Plan of Development. March.

Soda Mountain Solar, LLC, 2013b. Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299) for the Soda Mountain Solar Project. March 19.

Soda Mountain Solar, LLC, 2013c. Responses to Data Request #1, Soda Mountain Solar Project.

Soda Mountain Solar, LLC, 2013d. Responses to Data Request #2, Soda Mountain Solar Project.

Terra Physics, 2010. Geophysical Characterization of Subsurface Physical Properties Caithness LLC – Soda Mountain Solar Facility Southwest of Baker, San Bernardino County, California.

U.S. Environmental Protection Agency (USEPA), 2013a. RE-Powering America's Land, Renewable Energy Interactive Mapping Tool (rev. May 2). [http://www.epa.gov/oswercpa/rd_mapping_tool.htm] Accessed May 21, 2013.

USEPA, 2013b. Screenshot of RE-Powering America's Land, Renewable Energy Interactive Mapping Tool: USEPA-tracked and State-tracked sites, selected to show PV Utility Solar, PV Policy-driven Solar, and Non-grid PV Solar. Accessed May 21, 2013.

USEPA, 2013c. Screenshot of RE-Powering America's Land, Renewable Energy Interactive Mapping Tool: USEPA-tracked and State-tracked sites, selected to show Baker Refuse Disposal Site. Accessed May 21, 2013.

USEPA and NREL, 2013a. Renewable Energy on Contaminated Lands in California (rev. May 15). Pacific Southwest, Region 9. [http://www.epa.gov/region9/climatechange/renewcontlands/index.html] Accessed May 21, 2013.

USEPA and NREL, 2013b. Screenshot of Renewable Energy on Contaminated Lands in California: USEPA-tracked and State-tracked sites, selected to show Wind, CSP, Utility-scale PV, Hydro, additional sites with acreage data, and additional sites without acreage data. Accessed May 21, 2013.

Wilson Geosciences, Inc., 2011. Geologic Characterization Report for the Proposed Caithness Soda Mountain Solar Facility near Baker, San Bernardino, California. Prepared by Ken Wilson, Wilson Geosciences, Inc., for RMT, Inc., and Caithness Soda Mountain, LLC.

CHAPTER 3
Environmental Analysis

3.1 Introduction

This chapter assesses environmental consequences or impacts that would result from the implementation of the Proposed Action or other alternatives described in Chapter 2, *Proposed Action and Alternatives*, on resources, resource uses, special designations, and other important topics (including public health and safety, social and economic considerations, and environmental justice conditions). "Resources" include air, soil, water, vegetative communities, wildlife, wildland fire ecology and management, as well as cultural, paleontological, and visual resources. "Resource uses" include livestock grazing management, land use planning and realty, minerals, recreation management, transportation and public access, and utilities and public services. "Special designations" include areas of critical environmental concern (ACECs), and wilderness areas. Wilderness study areas and lands with wilderness characteristics also are considered. For each resource area evaluated, Chapter 3 includes a description of the regional and local environmental setting; summary of the applicable laws, regulations, plans, and standards; summary of the analytical methodology used; identification of the specific Applicant Proposed Measures (APMs) proposed to address the particular resource area; analysis of direct, indirect, and cumulative effects; identification of mitigation measures proposed to address specified effects; an explanation of the residual impacts that would remain after the implementation of all proposed Project design features, APMs, and mitigation measures; and analysis of California Environmental Quality Act (CEQA)-specific significance criteria as identified in the CEQA Guidelines (14 Cal. Code Regs. §15000 et seq.), Appendix G.

This chapter documents the lead agencies' analysis of the direct, indirect, and cumulative effects that could occur under the National Environmental Policy Act (NEPA) and CEQA as a result of implementing each of the alternatives. It considers the impacts of short-term uses, such as construction and decommissioning-related truck traffic, and the impacts that would occur over the longer-term operation and maintenance period or that would persist after initial occurrence, such as removal of slow-growing vegetation or destruction of irretrievable or irreplaceable resources. It also identifies mitigation measures that could avoid or reduce adverse impacts, and summarizes the residual and unavoidable adverse impacts on an issue-by-issue basis.

3.1.1 Baseline

The baseline for purposes of this Draft Plan Amendment/Environmental Impact Statement / Environmental Impact Report (PA/EIS/EIR) is on or about October 23, 2012, which is the date the

Bureau of Land Management (BLM) published a Notice of Intent announcing the intentions of the BLM and San Bernardino County (County) to prepare a PA/EIS/EIR (77 Fed. Reg. 64824-01). The County published a Notice of Preparation for the Project for CEQA purposes on October 26, 2012. The baseline is the affected environment described in Sections 3.2 through 3.21 and is intended to reflect the pre-Project environmental conditions to which the potential impacts of all alternatives are compared.

3.1.2 Analytical Assumptions

The impacts analyses contained in this chapter were conducted using the following assumptions:

1. The laws, regulations, and policies applicable to the BLM when it authorizes Right-of-Way (ROW) grants for renewable energy development facilities would be applied consistently for all action alternatives.
2. The laws, regulations, plans, ordinances, and policies applicable to the County authorizing groundwater well permits would be applied consistently for all action alternatives.
3. The proposed facility would be constructed, operated, maintained, and decommissioned as described in each action alternative.

3.1.3 Types of Effects

The potential impacts from those actions that could have direct, indirect, and cumulative effects are considered for each resource. The terms “effects” and “impacts” as used in this document are synonymous and could be beneficial or detrimental.

For NEPA purposes, CEQ regulations define direct effects as effects “…which are caused by the action and occur at the same time and place” and indirect effects as effects “…which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable” (40 CFR 1508.8(a)-(b)). “Because it can be difficult to distinguish between direct and indirect effects, [the BLM does] not have to differentiate the terms” and can describe the effects together (BLM NEPA Handbook §6.8.2). This document combines the discussion of direct and indirect effects. Chapter 3 also provides descriptions of the residual effects of any adverse impacts that remain after mitigation measures have been applied (BLM NEPA Handbook §6.8.4).

CEQ regulations define a cumulative effect as “…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions” (40 CFR 1508.7). The scenario used for defining and analyzing cumulative impacts is discussed in Section 3.1.5, below.

For CEQA purposes, CEQA Guidelines Section 15358 defines “effects” and “impacts” synonymously to include: direct or primary effects, which are caused by the project and occur at the same time and place; and indirect or secondary effects, which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. “Cumulative

effects" refer to two or more individual effects, which, when considered together, are considerable or that compound or increase other environmental impacts (CEQA Guidelines §15355). The cumulative effect from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (Id.).

3.1.4 Resources and Uses Not Affected or Present in the Action Area

Resources or BLM program areas that are not present in the Project area or not affected by the alternatives include: national wild, scenic, or recreational rivers; national scenic, recreational or historic trails; national monuments, recreation areas, or conservation areas; cooperative management and protection areas; outstanding natural areas; forest reserves; back country byways; wetlands; and livestock grazing.

The CEQA Guidelines Appendix G Section II, Agriculture and Forestry Resources, requires consideration of the potential for a project to:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract;

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));

d) Result in the loss of forest land or conversion of forest land to non-forest use; or

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

There is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the Project site, nor is there any land under a Williamson Act contract (California Department of Conservation, Division of Land Resource Protection, 2012, 2013). The California Desert Conservation Area Plan of 1980, as amended (CDCA Plan) indicates that on all Multiple-Use Class designations on the Project site, agricultural uses are not allowed; therefore, there is no land zoned for agricultural use on the Project site (BLM, 1999). Additionally, there is no forest or timberland on the Project site.

Because these resources and issues are not present on the Project site or affected by the Project, they are not discussed further.

3.1.5 Cumulative Scenario

3.1.5.1 Approach to the Analysis of Cumulative Effects

This document analyzes cumulative impacts of the construction, operation and maintenance, and closure and decommissioning of the ROW grant, groundwater wells, and all other elements of the Proposed Action and other alternatives. Consistent with Section 6.8.3.5 of the BLM NEPA Handbook, this Draft PA/EIS/EIR considers the direct and indirect effects of each alternative together with the effects of the other actions that could combine geographically and temporally (i.e., would be causing impacts in the same area at the same time as the Proposed Action and alternatives) and, thereby, cause a cumulative effect. For each resource or issue considered in this Chapter 3, the cumulative effects analysis identifies the relevant geographic area and time period within which cumulative effects could occur and then describes existing conditions (which are the combination of the natural condition and the effects of past actions) and the effects of other present and reasonably foreseeable future actions in combination with the effects of each alternative. Where relevant, the cumulative effects analysis also describes the relationship of the cumulative effects to any established thresholds. A quantitative analysis is provided where possible; where quantification is infeasible, qualitative effects are described.

If the Proposed Action or an alternative would have no direct or indirect effects on a resource, then it could not cause or contribute to potential cumulative effects on that resource. In these instances, no cumulative effects analysis has been completed. See, for example, Section 3.1.4, *Resources and Uses Not Affected or Present in the Action Area*.

3.1.5.2 Cumulative Scenario

The cumulative scenario for the Project includes the projects identified in Table 3.1-1, and described in Table 3.1-3. Table 3.1-1 identifies each resource or BLM program area; the geographic area relevant to each resource or issue; elements to consider; and the renewable projects, other known actions or activities that are located or would occur within the cumulative analysis impacts area.

Many renewable projects have been proposed on BLM-administered land, state land, and private land in California. As of January 2013, the California Renewable Energy Action Team (REAT) identified 526 renewable projects proposed in California in various stages of the environmental review process or under construction (REAT, 2013).[1] Solar, wind, and geothermal development applications have requested use of approximately 180,000 acres of BLM-administered land in the California desert (BLM, 2012a, 2012b). In addition, approximately 14 applications for solar, wind, and geothermal projects are being considered on BLM land in Nevada and Arizona (BLM 2013a, b). Table 3.1-2 identifies the total acreage and, where available, power rating of renewable energy projects authorized or applied for on the BLM's California Desert District lands.

[1] The REAT is a collaboration of state and federal agencies that was formed to streamline environmental review and permitting for compatible renewable energy projects and consists of the BLM, California Energy Commission (CEC), California Department of Fish and Wildlife (CDFW), and U.S. Fish and Wildlife Service (USFWS).

TABLE 3.1-1
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	Projects Potentially Contributing to Cumulative Impacts
Air Resources	Mojave Desert Air Basin (MDAB)	Mojave Desert Air Quality Management District (MDAQMD) significance thresholds	All projects in Table 3.1-3
Biological Resources – Vegetation	I-15 corridor, Soda Mountain valley, and the Soda Mountain range and adjacent mountain ranges in eastern San Bernardino County	Direct and indirect impacts to special-status plants and sensitive communities, invasive plants	XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion, Silurian Valley Wind, Silurian Valley Solar
Biological Resources – Wildlife	10-mile radius for cumulative effects on Mojave fringe-toed lizard, migratory birds, western burrowing owl, American badger, kit fox, and desert bighorn sheep; 20-mile radius for desert tortoise and golden eagle.	Direct and indirect impacts to special-status wildlife species, habitat removal	XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion, Silurian Valley Wind, Silurian Valley Solar
Climate Change	Global	Emissions of greenhouse gases	All projects in Table 3.1-3
Cultural Resources	Eastern San Bernardino County	Cultural resources, traditional use areas, and cultural landscapes	All projects in Table 3.1-3
Environmental Justice	Not applicable	Not applicable	Not applicable
Geology and Soil Resources	Project watershed, groundwater aquifer	Soil erosion, land subsidence due to groundwater drawdown	XpressWest High Speed Passenger Rail and Calnev Pipeline Expansion
Hazards and Hazardous Materials	Air basin, watershed boundary, groundwater basin, or extent of affected soils for hazardous materials; California Desert for intentionally destructive acts	Release of hazardous materials resulting in air, soil, or water contamination; intentionally destructive acts	Silurian Valley Wind, Silurian Valley Solar
Lands and Realty	Utility corridor number 27-225	Uses occupying designated utility corridors	XpressWest High Speed Passenger Rail Project and Calnev Pipeline Expansion Project
Mineral Resources	All areas underlain by sand and gravel within eastern San Bernardino County	Availability and accessibility of mineral resources	All projects in Table 3.1-3
Multiple Use Classes	CDCA Plan area lands designated Class L, M, and I	Restriction of multiple use opportunities	All projects in Table 3.1-2
Noise	Approximately 0.5 mile of the Project site	Combined noise levels at sensitive receptors	XpressWest High Speed Passenger Rail and Calnev Pipeline Expansion
Paleontological Resources	Paleontologically sensitive soil units in the valley in which the Project would be located	Destruction of paleontological resources	XpressWest High Speed Passenger Rail and Calnev Pipeline Expansion
Recreation and Public Access	CDCA lands available for recreation accessible from I-15 wihin 50 miles of the Project site	Vehicle access, air quality, noise, visual resources	Silurian Valley Wind, Silurian Valley Solar, XpressWest Rail, Calnev Pipeline Expansion
Socioeconomic Effects	2-hour commute distance from projects in cumulative scenario (Las Vegas to Lancaster and Palmdale)	Construction, operation and maintenance, and decommissioning workforce demand; housing and lodging impacts; effects on social character of communities; economic effects	Abengoa Mojave Solar, Ivanpah Solar, Silurian Valley Wind, Silurian Valley Solar, XpressWest Rail, Calnev Pipeline Expansion, Stateline Solar, and Joint Port of Entry projects

TABLE 3.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	Projects Potentially Contributing to Cumulative Impacts
Special Designations	Not applicable	Not applicable	Not applicable
Transportation and Traffic	I-15 corridor in the immediate vicinity of the Project site	Contribution of vehicle trips to I-15 during peak hours	All projects in Table 3.1-3
Utilities and Public Services	Surface waters within the Mojave River Basin that receive surface flow from the Project site; areas overlying the Soda Lake Valley Groundwater Basin; areas served by Barstow Sanitary Landfill	Stormwater runoff volume and quality, groundwater consumption, solid waste generation	XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion
Visual Resources	Viewshed of I-15 corridor and locations from which the Project and other projects can be seen	Additive or synergistic visual contrast	Stateline, Ivanpah Solar Electric Generating System, Silurian Valley Wind, Silurian Valley Solar, XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion
Wildland Fire Ecology	Soda Mountains Range	Changes in vegetation and risk of igniting wildfires	XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion, Silurian Valley Wind, Silurian Valley Solar
Water Resources	Surface waters within the Mojave River Basin that receive surface flow from the Project site; areas overlying the Soda Lake Valley Groundwater Basin	Sedimentation and other pollution of surface waters, groundwater consumption and drawdown	XpressWest High Speed Passenger Rail, Calnev Pipeline Expansion

TABLE 3.1-2
RENEWABLE ENERGY PROJECT APPLICATIONS AND AUTHORIZATIONS IN THE CALIFORNIA DESERT DISTRICT

BLM Field Office	Number of Projects & Acres	Total MW
Solar Energy		
Barstow Field Office	7 projects 40,960 acres	3,659 MW
El Centro Field Office	2 projects 801 acres	40 MW
Needles Field Office	2 projects 5,471 acres	670 MW
Palm Springs Field Office	13 projects 82,954 acres	5,262 MW
TOTAL – CA Desert District	***24 projects 130,186 acres***	***9,631 MW***
Wind Energy		
Barstow Field Office	2 projects 8,806 acres	241 MW
El Centro Field Office	4 projects 37,757 acres	782 MW
Ridgecrest Field Office	3 projects 3,399 acres	360 MW
TOTAL – CA Desert District	***9, projects 49,962 acres***	***1,383 MW***

NOTE: Wind energy projects include applications and authorizations for development and do not include applications and authorizations for testing only. Solar energy totals include the Soda Mountain Solar Project.

SOURCE: BLM, 2012a, b

Large renewable projects now described in applications to the BLM and on private land are competing for utility Power Purchase Agreements (PPAs), which will allow utilities to meet state-required Renewables Portfolio Standard (RPS) targets. California's RPS requires retail electricity sellers regulated by the California Public Utilities Commission (CPUC) to procure 33 percent of retail sales per year from eligible renewable sources by 2020, and also requires that they achieve intermediate targets, one of which is to average 25 percent of retail sales from renewable sources from 2014 to 2016. As of late 2012, California's regulated utilities are anticipated to meet or exceed this intermediate target based on forecasted trends in renewable energy development. However, current forecasting does not indicate that utilities are "on track" to meet the 2020 goal. These conditions may result in a limited market for new renewable energy to come online through 2016, but an increased demand for new sources between 2016 and 2020. Despite being a small portion of the current portfolio, solar photovoltaic (PV) technology is forecasted to contribute 34 percent of the state's total renewable generation by 2020. (CPUC, 2013)

Additionally, the Los Angeles Department of Water and Power (LADWP) has its own RPS, with a goal of providing 35 percent of its electricity from renewable sources by 2020 (LADWP,

2013a). As of 2011, LADWP's current portfolio contained approximately 19 percent renewable energy (LADWP, 2012). As of 2013, LADWP also provided 39 percent of its electricity from coal-fired power plants in Arizona and Utah, but intends to end all coal-fired electricity imports by 2025, in part by procuring new renewable energy sources (LADWP, 2013b).

While a large number of projects may be planned, and so are considered to be possible for future development, not all of them are expected to actually be built due to construction funding constraints, schedule, and/or delays. Given the uncertain and challenging economic circumstances facing federal and state economies as well as private developers, it is not assured that future funding and other necessary support will be sufficiently available for all of the proposed projects to be realized within the anticipated schedules. However, based on the potential demand for new renewable sources previously described, the cumulative project scenario includes all projects identified as reasonably foreseeable as of the publication of the Draft PA/EIS/EIR. Table 3.1-3 identifies the existing and reasonably foreseeable future projects in San Bernardino County and along the I-15 corridor that could contribute to cumulative impacts of the same type as the Proposed Action or alternatives.

3.1.6 Mitigation Measures Identified in the Analysis

For impacts identified in the following resource sections, mitigation measures have been developed to avoid or reduce potential adverse environmental effects that would be implemented during all appropriate phases of the Project, from initial ground breaking and construction, to operation and maintenance, and through closure and decommissioning. The analysis considers the Project's potential environmental impacts after the implementation of all Project design features and other measures proposed by the Applicant to reduce potential impacts (Applicant Proposed Measures or APMs) and regulatory requirements of federal, state, and local agencies.

An Environmental and Construction Compliance Monitoring Plan (ECCMP)/Mitigation Monitoring, Reporting, and Compliance Program (MMRCP) would be prepared if the Proposed Action or another action alternative is approved to ensure the effective implementation of the mitigation measures identified to address adverse impacts.

Because these mitigation measures are derived from a variety of sources, they also may be required by agencies other than the BLM or the County and their implementation would be enforced by those other agencies. For instance, any Reasonable and Prudent Measures identified by the USFWS as part of the Federal Endangered Species Act (FESA) Section 7 process would be included in the ROD. If the Proposed Action or another action alternative is approved, the Applicant would be required by the ROD and the ROW grant to comply with the requirements of those other agencies (see, e.g., 43 CFR 2805.12(a) [federal and state laws and regulations], and (i)(6) [more stringent state standards for public health and safety, environmental protection and siting, constructing, operating, and maintaining any facilities and improvements on the ROW]). Any non-compliance with implementation of these other requirements may affect the status of the ROD and ROW grant.

TABLE 3.1-3
EXISTING AND REASONABLY FORESEEABLE FUTURE PROJECTS

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
1	Silurian Valley Wind Project (CACA 51581)	Silurian Valley, north of Baker, San Bernardino County	Pacific Wind (Iberdrola)	Pending Project: Revised POD submitted May 2011; construction proposed in 2014	856 disturbed on 6,720-acre ROW	Up to 240 MW, 80 to 133 turbine wind project including a substation, 10-mile generation-transmission tie line, and approximately 45 miles of access roads. (Pacific Wind Development, LLC, 2011)
2	Silurian Valley Solar (CACA 53865)	Silurian Valley	Aurora Solar, LLC (Iberdrola)	Pending Application; Application submitted August 2012; no approved Plan of Development	7,218	150 MW solar photovoltaic project.
3	Stateline Solar Farm Project (CACA 48669)	2 miles south of the California-Nevada border and 0.5 mile west of I-15 in eastern San Bernardino County	First Solar Development, Inc.	Pending Project: Draft EIS published November 2012	2,143	300 MW solar photovoltaic project (BLM and San Bernardino County, 2012b)
4	Abengoa Mojave Solar (CACA 52096)	Harper Dry Lake, 25 miles northwest of Barstow	Abengoa Solar	Existing Project: Under construction; estimated complete in 2014.	1,765	A 250 MW solar thermal parabolic trough project using wet cooling (National Renewable Energy Laboratory, 2013; U.S. Department of Energy, 2013).
5	XpressWest High Speed Rail Project (CACA 48497 and NVN 82673)	Victorville to Las Vegas along I-15	DesertXpress Enterprises, LLC	Authorized Project: Authorized July 2011 (Federal Railroad Administration [FRA]) and October 2011 (BLM).	1,300-acre ROW	This project formerly was known as the "DesertXpress High Speed Passenger Rail Project." The FRA preferred alternative, Segment 3B (modified), would be constructed on the northwest side of I-15 in the Project Area, and a Maintenance of Way facility is located in the town of Baker. (FRA, 2011a, 2011b; BLM, 2011). For additional information about the project and its environmental effects, see the Record of Decision and Final EIS, each of which is available on the BLM's website: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/ Barstow/pubs.Par. 2523.File.dat/DXE%20ROD%20FINAL%20updated%2010-28-11.pdf
6	Calnev Pipeline Expansion Project (CACA 49138/CAD 080000.26)	Colton to Las Vegas along I-15	Calnev Pipe Line, LLC	Pending Project: Draft EIS/EIR published March 2012	1,820.4	A 233-mile,16-inch-diameter refined petroleum products pipeline on the northwest side of I-15 in the Project area, including a new pumping station near the town of Baker. (BLM and San Bernardino County, 2012a)
7	Communications sites	Within Barstow Field Office Area	Various communications companies	Existing/Proposed projects	NA	There are several existing and proposed communications sites in the Project area consisting of towers with communications equipment.
8	Ivanpah Solar Electric Generating System Project (CACA 48668)	Ivanpah Dry Lake, 4.5 miles southwest of Primm, Nevada along I-15	BrightSource	Existing Project: Under construction, estimated complete in 2013.	4,073	400 MW solar thermal power tower project (BLM, 2010)

TABLE 3.1-3 (Continued)
EXISTING AND REASONABLY FORESEEABLE FUTURE PROJECTS

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
9	Interstate 15 Joint Port of Entry (CACA 51457-01)	Ivanpah Dry Lake, 4.5 miles southwest of Primm, Nevada along I-15	California Department of Transportation	Existing Project: under construction, estimated complete in early 2015.	133.19	Joint Port of Entry for commercial vehicle and agriculture inspections.
10	Mining Claims	Within Barstow Field Office Area	Various mining claimants	Claims Filed: none have submitted plans of operation	NA	Location dates vary from September of 2012 to May 2012.
11	Johnson Valley Military Expansion (CACA 50194)	South of I-40	United States Department of the Navy	Pending Project: Final EIS published June 2012	Up to 201,657	Proposed expansion of Twentynine Palms Marine Corps Air Ground Combat Center under Engle Act. Land Acquisition and Airspace Establishment.

3.1.6.1 Terms and Conditions found in FLPMA and BLM ROW Regulations

Title V of the Federal Land Policy and Management Act (FLPMA) addresses the issuance of ROW authorizations on public land. The BLM has identified all the lands that would be occupied by facilities associated with the Project that are needed for its construction, operation, and maintenance. The general terms and conditions for all public land ROWs are described in FLPMA Section 505, and include measures to minimize damage and otherwise protect the environment, require compliance with air and water quality standards, and compliance with more stringent state standards for public health and safety, environmental protection, siting, construction, operation, and maintenance of ROWs. The Secretary may prescribe additional terms and conditions as deemed necessary to protect federal property, provide for efficient management, and among other things, generally protect the public interest in the public lands subject to or lands adjacent thereto. For this Project, terms and conditions would be incorporated into the ROW grant that are necessary to protect public safety, including security fencing and on-site personnel.

As noted above, this PA/EIS/EIR identifies impacts and mitigation measures to reduce or avoid adverse impacts. The mitigation measures identified by the BLM and incorporated as terms and conditions of the ROW grant provide those actions necessary to prevent unnecessary or undue degradation of the public lands as required by FLPMA Section 302. The additional mitigation measures that are identified and described in the PA/EIS/EIR and that would be enforced by the other agencies, as noted above, provide additional protection to public land resources.

Finally, all BLM ROW grants are approved subject to regulations contained at 43 CFR Section 2800. For example, those regulations specify that the BLM may, at any time, change the terms and conditions of a ROW grant “as a result of changes in legislation, regulations, or as otherwise necessary to protect public health or safety or the environment” (43 CFR 2805.15(e)). The BLM would monitor conditions and review any ROW grant issued for the Project to evaluate if future changes to the grant terms and conditions are necessary or justified under this provision of the regulations to further minimize or reduce impacts resulting from the Project. If approved, the solar energy ROW grant authorization would include diligent development terms and conditions, consistent with the requirements of 43 CFR Section 2805.12(i)(5). Failure of the holder to comply with the diligent development terms and conditions provides the BLM authorized officer the authority to suspend or terminate the authorization (43 CFR 2807.17). If approved, the solar energy ROW grant authorization would include a required “Performance and Reclamation” bond to ensure compliance with the terms and conditions of the ROW authorization, consistent with the requirements of 43 CFR Section 2805.12(g). The “Performance and Reclamation” bond would consist of three components: The first component would be hazardous materials; the second component would be the decommissioning and removal of improvements and facilities; and the third component would address reclamation, revegetation, restoration, and soil stabilization.

3.1.6.2 County-established Standard Conditions of Approval

San Bernardino County has not established standard conditions of approval specific to groundwater well permits. However, as established in Section 33.06554(d) of the San Bernardino County Code, the County may impose conditions of approval to ensure that the Project's well operations would not adversely affect the groundwater safe yield and health of the affected aquifer including, but not limited to, conditions requiring groundwater management, mitigation, and monitoring by the Applicant (San Bernardino County, 2002).

References

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended through 1999.

BLM, 2010. Ivanpah Solar Electric Generating System Final Environmental Impact Statement. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.19048.File.dat/1-CDCA-Ivanpah-Final-EIS.pdf]

BLM, 2011. Record of Decision for the DesertXpress Enterprises, LLC High-Speed Passenger Train Project. October. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow/pubs.Par.2523.File.dat/DXE%20ROD%20FINAL%20updated%2010-28-11.pdf]

BLM, 2012a. BLM California Solar Applications and Authorizations. November. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/solar.Par.84447.File.dat/BLM%20Solar%20Apps%20and%20Auths.pdf]

BLM, 2012b. BLM California Wind Applications and Authorizations. November. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy.Par.5556.File.dat/BLM%20Solar%20Apps%20&%20Auths%20July%202012.pdf]

BLM, 2013a. Fast Facts about Renewable Energy Projects. [http://www.blm.gov/nv/st/en/prog/energy/fast-track_renewable.html] Accessed April 3, 2013.

BLM, 2013b. Active Energy Projects – BLM Arizona. [http://www.blm.gov/az/st/en/prog/energy/active.html] Accessed April 3, 2013.

BLM and San Bernardino County, 2012a. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/Environmental Impact Report. March. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow/calnev_pipeline.Par.95926.File.dat/DEIS-EIR%20for%20Calnev%20Pipeline%20Expansion%20Project_FOR%20CD3.pdf]

BLM and San Bernardino County, 2012b. Stateline Solar Farm Project Draft Environmental Impact Statement/Environmental Impact Report. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.47817.File.dat/Stateline%20Solar%20Farm%20Draft%20EIS-EIR%20-%20Nov%202012_508.pdf]

California Department of Conservation, Division of Land Resource Protection, 2012. California Important Farmland Finder. [http://maps.conservation.ca.gov/ciff/ciff.html] Accessed May 8, 2013.

California Department of Conservation, Division of Land Resource Protection, 2013. State of California Williamson Act Contract Land. [ftp://ftp.consrv.ca.gov/pub/dlrp/wa/2012%20Statewide%20Map/WA_2012_36x42.pdf]

California Public Utilities Commission (CPUC), 2013. Renewables Portfolio Standard Quarterly Report, 3rd and 4th Quarter 2012. [http://www.cpuc.ca.gov/NR/rdonlyres/4F902F57-78BA-4A5F-BDFA-C9CAF48A2500/0/2012_Q3_Q4RPSReportFINAL.pdf]

Federal Railroad Administration (FRA), 2011a. Final Environmental Impact Statement and Final Section 4(f) Evaluation for the Proposed DesertXpress High-Speed Passenger Train Victorville, California to Las Vegas, Nevada. March.

FRA, 2011b. Record of Decision DesertXpress High-Speed Passenger Train. July. [http://www.fra.dot.gov/rpd/downloads/ROD_FINAL.pdf]

Los Angeles Department of Water and Power (LADWP), 2012. Annual Report of Actual Electricity Purchases for LADWP Calendar Year 2011. [https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-powercontentlabel?_adf.ctrl-state=1by9q28mc4_88&_afrLoop=72366782844000] Accessed April 26, 2013.

LADWP, 2013a. RPS Program. [https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-renewableenergy/a-p-re-rpsprogram?_adf.ctrl-state=1by9q28mc4_88&_afrLoop=72178718709000] Accessed April 26, 2013.

LADWP, 2013b. L.A.'s Clean Energy Future: Eliminating Coal from L.A.'s Power Supply. March. [http://www.ladwpnews.com/external/content/document/1475/1727403/1/Navajo%20+%20IPP%20Coal%20Elimination%20Presentation%20031913.pdf]

National Renewable Energy Laboratory, 2013. Mojave Solar Project. [www.nrel.gov/csp/solarpaces/project_detail.cfm/projectID=57] Accessed April 15, 2013.

Pacific Wind Development, LLC, 2011. Plan of Development Silurian Valley Wind Energy Project. May.

Renewable Energy Action Team (REAT), 2013. 2013 Projects Under Review. January. [http://www.energy.ca.gov/33by2020/documents/renewable_projects/REAT_Generation_Tracking_Projects_Report.pdf]

San Bernardino County, 2002. Ordinance No. 3872.

U.S. Department of Energy, 2013. Abengoa Solar, Inc. (Mojave Solar). [https://lpo.energy.gov/?projects=abengoa-solar-inc-mojave-solar] Accessed April 15, 2013.

This page intentionally left blank

3.2 Air Resources

3.2.1 Introduction

This section describes and evaluates air resources issues in the context of the Proposed Action and alternatives. Discussed are the physical and regulatory setting, the analytical methodology of the analysis, the direct and indirect effects of the Proposed Action and alternatives, cumulative effects, mitigation, residual effects on air resources, and CEQA significance thresholds and determinations for the Proposed Action and alternatives.

3.2.2 Regional and Local Environmental Setting

3.2.2.1 Topography and Meteorological Conditions

The Project area is within the Mojave Desert Air Basin (MDAB), 6 miles southwest of Baker, California, along Interstate 15 (I-15). The MDAB covers an assemblage of mountain ranges interspersed with long, broad valleys. The Project site ranges in elevation between approximately 1,200 feet above mean sea level (amsl) to 1,500 feet amsl, and is just east of Soda Mountain, which peaks at approximately 3,700 feet amsl.

Prevailing winds in the MDAB are from the west and southwest due to the basin's proximity to coastal regions to the west and the blocking nature of the Sierra Nevada mountains to the north. During the summer, a Pacific Subtropical High cell off the coast persistently inhibits cloud formation and allows strong daytime solar heating of the MDAB. Cold air masses moving south from Canada and Alaska rarely influence the MDAB because these frontal systems are usually weak and diffuse by the time that they reach the MDAB. Most desert moisture arrives at the MDAB from infrequent warm, moist, and unstable air masses from the south (MDAQMD, 2011). Climate data for Baker are considered representative of the Project area. The average daily maximum and minimum summer temperatures (i.e., July) in Baker are 110 degrees Fahrenheit (°F) and 77 °F, respectively, and the average daily maximum and minimum winter (i.e., January) temperatures are 63 °F and 35 °F, respectively. Average annual precipitation in Baker is 4.2 inches (Western Regional Climate Center [WRCC], 2013).

3.2.2.2 Existing Air Quality

The Federal Clean Air Act and the California Clean Air Act both require the establishment of standards for ambient concentrations of air pollutants, called Ambient Air Quality Standards (AAQSs). The federal AAQSs, established by U.S. Environmental Protection Agency (USEPA), are typically higher (less protective) than the state AAQSs, which are established by the California Air Resources Board (CARB) and enforced by the local air district. The Project area is within the Mojave Desert Air Quality Management District (MDAQMD). The federal and state AAQSs are listed in Table 3.2-1. The air quality standard time periods over which the various pollutants are measured range from a 1-hour average to an annual average. The standards are read as a concentration, in parts per million (ppm) or as a weighted mass of material per a volume of air, in milligrams or micrograms of the pollutant in a cubic meter of air (mg/m^3 or $\mu g/m^3$, respectively).

TABLE 3.2-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8-Hour	0.075 ppm (147 µg/m^3)	0.070 ppm (137 µg/m^3)
	1-Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.030 ppm (57 µg/m^3)
	1-Hour	0.100 ppm (188 µg/m^3)	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	Annual	—	—
	24-Hour	—	0.04 ppm (105 µg/m^3)
	3-Hour	0.5 ppm (1,300 µg/m^3)	—
	1-Hour	0.075 ppm (196 µg/m^3)	0.250 ppm (655 µg/m^3)
Particulate Matter (PM_{10})	Annual	—	20 µg/m^3
	24-Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)*	Annual	12 µg/m^3	12 µg/m^3
	24-Hour	35 µg/m^3	—
Sulfates (SO_4)	24-Hour	—	25 µg/m^3
Lead (Pb)	30-Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
	Rolling 3-Month Average	0.15 µg/m^3	—
Hydrogen Sulfide (H_2S)	1-Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24-Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8-Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

NOTE:

* On December 14, 2012, the USEPA strengthened the annual federal AAQS for $PM_{2.5}$ from to 15.0 micrograms per cubic meter (µg/m^3) to 12.0 µg/m^3. USEPA anticipates making initial attainment/non-attainment designations for the revised standard by December 2014, with those designations likely becoming effective in early 2015.

SOURCES: CARB, 2012; USEPA, 2013.

In general, an area is designated as “attainment” if the concentration of a particular air contaminant does not exceed the standard. Likewise, an area is designated as “non-attainment” for an air contaminant if that contaminant standard is violated. In circumstances where there is not enough ambient data available to support designation as either attainment or non-attainment, the area can be designated as unclassified. An unclassified area is normally treated by the USEPA the same as an attainment area for regulatory purposes. An area could be designated attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same air contaminant.

The Project area currently is designated as a non-attainment area for the state 1-hour and 8-hour ozone standards, the state PM_{10} 24-hour standard, and the federal PM_{10} 24-hour standard. The southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is classified as a non-attainment area for the federal 8-hour ozone standard and the state $PM_{2.5}$ annual standard. See Figure 3.2-1 for an illustration of the portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area. The Project area is designated as attainment for all other federal and state AAQSs (CARB, 2013a). Table 3.2-2 summarizes the Project area's attainment status for various applicable state and federal AAQSs.

TABLE 3.2-2
FEDERAL AND STATE ATTAINMENT STATUS FOR THE PROJECT AREA

Pollutant	Attainment Status	
	State	Federal
Ozone	Non-attainment (Moderate)	Non-attainment (Severe)*
PM_{10}	Non-Attainment	Non-attainment (Moderate)
$PM_{2.5}$	Non-Attainment*	Attainment/Unclassified
CO	Attainment	Attainment/Unclassified
NO_2	Attainment/Unclassified	Attainment/Unclassified
SO_2	Attainment/Unclassified	Attainment/Unclassified

NOTES:

* The portion of Project site outside the Western Mojave Desert Ozone Non-attainment Area is unclassified/attainment of the federal ozone standard and the state $PM_{2.5}$ standard.

Unclassified is treated the same as Attainment for regulatory purposes.

SOURCE: CARB, 2013a.

The nearest ambient air quality monitoring locations to the Project area are at the Mojave National Preserve, Barstow, and Victorville monitoring stations, which are approximately 30 miles east, 50 miles west-southwest, and 75 miles southwest of the Project site, respectively. The Mojave National Preserve monitoring station is relatively new and only ozone data for 2012 is available from this station. The Barstow station monitors concentrations of ozone, PM_{10}, CO, and NO_2, and the Victorville station also monitors $PM_{2.5}$ and SO_2. Maximum ambient concentrations measured at the Mojave National Preserve (ozone in 2012), Barstow (ozone from 2007 through 2012, and PM_{10}, CO, and NO_2 for 2007 through 2012), and Victorville ($PM_{2.5}$ and SO_2 for 2007 through 2012) monitoring stations are representative of the Project area and are shown in Table 3.2-3.The maximum ambient air pollutant concentrations identified in the table for the 6-year study period are compared to the most restrictive applicable standards. Following Table 3.2-3 are brief descriptions of the criteria pollutants, including a summary of the applicable representative monitoring data.

Ozone (O_3)

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted nitrogen oxides (NO_x) and hydrocarbons (e.g., reactive organic gases or ROGs) in the presence of sunlight. Pollutant

TABLE 3.2-3
CRITERIA POLLUTANT MAXIMUM AMBIENT CONCENTRATIONS[a]

Pollutant	Averaging Period	Units	2007	2008	2009	2010	2011	2012	Limiting AAQS[b]
Ozone	1-Hour	ppm	0.099	0.104	0.095	0.097	0.093	0.086	0.09
Ozone	8-Hour	ppm	0.088	0.096	0.086	0.078	0.084	0.083	0.070
PM_{10}	24-Hour	$\mu g/m^3$	202.0	93.0	76.0	38.0	98.0	42.0	50
$PM_{2.5}$	24-Hour	$\mu g/m^3$	28	17	20	18	15	12	35
CO	8-Hour	ppm	0.70	1.23	0.89	0.89	1.35	0.66	9
NO_2	1-Hour	ppm	0.073	0.081	0.060	0.062	0.077	0.146	0.100
SO_2	24-Hour	ppm	0.005	0.002	0.005	0.007	0.007	0.003	0.04

NOTES:

a Ozone data for 2012 were collected from the Mojave National Preserve monitoring station; ozone data for 2007 through 2011 and PM_{10}, CO, and NO_2 data all 6 years were collected from the Barstow monitoring station; and $PM_{2.5}$ and SO_2 data for all six years were collected from the Victorville monitoring station.

b The limiting AAQS is the most stringent of the federal or state AAQSs for that pollutant and averaging period.

SOURCE: CARB, 2013b.

transport from the South Coast Air Basin is one source of the ozone pollution in San Bernardino County. With the exception of 2011 and 2012 relative to the 1-hour standard, exceedances of the state 1-hour and state and federal 8-hour standards occurred during each of the study period years as indicated in Table 3.2-3. The available data indicate that the ozone violations occurred primarily during sunny and hot periods, typically during May through August.

Nitrogen Dioxide (NO_2)

The entire MDAB is classified as attainment for the state and federal 1-hour and annual NO_2 standards. Approximately 90 percent of the NO_x emitted from combustion sources is nitric oxide (NO), while the balance is NO_2. NO is oxidized in the atmosphere to NO_2, but photochemical activity is needed for this conversion. The highest concentrations of NO_2 typically occur during the fall. The winter atmospheric conditions can trap emissions near the ground level, but lacking substantial photochemical activity (i.e., sunlight), NO_2 levels tend to be relatively low. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions disperse pollutants, preventing the accumulation of NO_2. The data in Table 3.2-3 show no exceedances of the NO_2 1-hour standard during the study period.

Carbon Monoxide (CO)

San Bernardino County is classified as attainment for the state and federal 1- and 8-hour CO standards. The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level. These conditions occur frequently in the wintertime late in the afternoon, persist during the night, and may extend 1 or 2 hours after sunrise. The Project area has a lack of substantial mobile source emissions, which results in CO concentrations that are well below the state and federal AAQSs.

Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$)

PM_{10} can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. The Project area is classified as non-attainment for both state and federal PM_{10} standards. Table 3.2-3 shows recent PM_{10} and $PM_{2.5}$ concentrations, and shows clear exceedances of the state 24-hour PM_{10} standard except for years 2010 and 2012. Fine particulate matter, or $PM_{2.5}$, is derived mainly either from the combustion of materials, or from precursor gases (SO_x, NO_x, and ROG) through complex reactions in the atmosphere. $PM_{2.5}$ consists mostly of sulfates, nitrates, ammonium, elemental carbon, and a small portion of organic and inorganic compounds. The MDAB is classified as non-attainment for the state standard within the Western Mojave Desert Ozone Non-attainment Area (see Figure 3.2-1) and classified as attainment or unclassified for the federal $PM_{2.5}$ standards. As indicated in Table 3.2-3, $PM_{2.5}$ concentrations did not exceed the federal 24-hour standard during the 6-year study period.

Sulfur Dioxide (SO_2)

The entire MDAB is unclassified/attainment for the state and federal SO_2 standards. SO_2 is typically emitted as a result of the combustion of a fuel containing sulfur. As indicated in Table 3.2-3, SO_2 concentrations did not exceed the state 24-hour standard during the 6-year study period.

3.2.2.3 Sensitive Receptors

For the purposes of this air quality analysis, sensitive receptors are defined as facilities and land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of facilities include schools, hospitals, and daycare centers. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, and/or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm at these facilities are more susceptible to respiratory distress and other air quality-related health problems than the general population. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality.

The Project site is not within the immediate vicinity of non-residential sensitive receptors (e.g., schools, hospitals, daycare centers, long-term care facilities). The closest schools are Baker Elementary, Middle, and High Schools, which are all over 6.5 miles from the Project site, in the northeastern portion of the town of Baker. The closest residences to the Project site are located adjacent to the service station on Rasor Road, approximately 230 feet southwest of the requested Project ROW (see Figure 3.2-1, which shows residence locations). The residences include a single-family residence and workforce housing for four employees.

Additionally, California State University Desert Studies Center field station is located approximately 3.5 miles east of the Project site on Zzyzx Road. The Desert Studies Center is a research and educational center that provides the opportunity for individuals and groups to

conduct research, receive instruction, and experience the desert environment. The Desert Studies Center can accommodate 75 individuals in dormitory-style rooms holding two to 12 persons. Camping is permitted in the Rasor Open Area approximately 2.5 miles south of the requested ROW, accessible from the Rasor Road exit off I-15.

The Project area is approximately 70 miles north of the nearest Federal Class I air quality protection area, Joshua Tree National Park (USEPA, 2012). Federal Class I areas receive the highest protection for air quality in the United States.

3.2.3 Applicable Laws, Regulations, Plans, and Standards

3.2.3.1 Federal

The USEPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal AAQSs and judging the adequacy of State Implementation Plans (SIPs). The USEPA has delegated its authority to implement many of the federal programs to California while retaining an oversight role to ensure that the programs continue to be implemented.

MDAQMD is responsible for issuing federal New Source Review (NSR) permits and has been delegated enforcement of the New Source Performance Standards (NSPS). The federal NSR program requires air quality construction and operating permits (i.e., NSR air quality permits) for stationary sources when they exceed specific emissions thresholds for non-attainment pollutants, and require Prevention of Significant Deterioration (PSD) air quality permits when specific emissions thresholds are exceeded for attainment pollutants. The NSPS are emission control/ performance standards for specific types of stationary sources, such as boilers, cement kilns, gas turbines, etc. However, the Project does not include stationary sources of air pollution that would have emissions high enough to trigger federal air quality (NSR) permitting, or that would be subject to any of the NSPS [40 Code of Federal Regulations (CFR) Part 52; 40 CFR Part 60].

Pursuant to the 1990 Federal Clean Air Act Amendments, the USEPA passed two separate federal conformity rules to ensure that air pollutant emissions associated with federally approved or funded activities do not exceed emission budgets established in the applicable SIP and do not otherwise interfere with the State's ability to attain and maintain the federal AAQSs in areas working to attain or maintain the standards. The rules were set forth at 40 CFR Parts 51 and 93 and include Transportation Conformity, which applies to transportation plans, programs, and projects, and General Conformity, which applies to all other non-transportation related projects, such as the Proposed Action. A detailed determination of the applicability of the General Conformity rule is required pursuant to 40 CFR Part 51, Subpart W, when federal actions or funding of non-transportation related activities in non-attainment areas result in emissions that exceed *de minimis* threshold levels applicable to the specific non-attainment class (USEPA, 2010). The Project site is located in a federal non-attainment area for ozone and PM_{10} and therefore the Project would be subject to the general conformity regulations if Project emissions would exceed *de minimis* levels.

In addition, the USEPA has set emission standards for non-road diesel engines, including those that would be used to construct the Project. These standards are published in 40 CFR Part 89.

CDCA Plan

The CDCA Plan requires that all areas within the CDCA, regardless of multiple-use class, be managed to protect their air quality and visibility in accordance with Class II objectives of Part C of the Clean Air Act Amendments, unless otherwise designated another class by the State of California as a result of recommendations developed by any BLM air quality management plan.

3.2.3.2 State

As discussed above in Section 3.2.1.2, CARB has established state AAQSs for many of the same pollutants covered by the federal AAQSs that are as stringent, or more stringent, than the federal AAQSs. Pollutants regulated under these standards include ozone, NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Additional information regarding the state AAQSs that are relevant to the Project is provided Section 3.2.1.2.

CARB also has on-road and off-road engine emission reduction programs that would indirectly affect the Project's emissions through phasing in cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a statewide portable program to operate their equipment. Registered engines and equipment meeting specified program emission requirements valid throughout California do not need to obtain individual permits from local air districts.

In 1990, the State of California administratively listed under Proposition 65 the particulates formed in the exhaust of diesel-powered equipment and vehicles as a chemical known to the state to cause cancer. California has also enacted a regulation for the reduction of toxic air contaminants (TACs) in the form of diesel particulate matter (DPM) and criteria pollutant emissions from in-use off-road diesel-fueled vehicles (13 Cal. Code Regs. §2449). This regulation provides target emission rates for PM and NO_x emissions from owners of fleets of diesel-fueled off-road vehicles and applies to equipment fleets of three specific sizes; target emission rates are reduced over time (CARB, 2011). CARB has also adopted a regulation for in-use off-road diesel vehicles designed to reduce emissions from diesel-powered construction and mining vehicles by imposing idling limitations on owners, operators, renters, or lessees of off-road diesel vehicles. The regulation requires an operator of applicable off-road vehicles (self-propelled diesel-fueled vehicles 25 horsepower or more that were not designed to be driven on-road) to limit idling to no more than 5 minutes.

3.2.3.3 Local

Mojave Desert Air Quality Management District

The Project site is within the jurisdiction of the MDAQMD. The MDAQMD regulates air pollutant emissions for all sources in the MDAB other than motor vehicles. The MDAQMD enforces regulations and administers permits governing stationary sources. The only stationary

source that would be associated with the Project would be one standby emergency generator. The following rules would apply to the Project:

Rule 402 – Nuisance

This rule prohibits discharge from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property (MDAQMD, 1977).

Rule 403 – Fugitive Dust

This rule limits the emissions of fugitive dust or particulate matter from a variety of activities and sources such as grading, construction, and storage sites. It includes a visible emissions property line standard, a sampling standard of 100 $\mu g/m^3$, and precautionary requirements to prevent trackout on paved public roads (MDAQMD, 1977).

Rule 403.2 – Fugitive Dust Control for the Mojave Desert Planning Area

This rule requires the preparation and approval of a dust control plan prior to commencing earth-moving activities. The plan may include measures such as implementing periodic watering, preventing trackout onto paved surfaces, covering loaded haul vehicles while operating on publicly-maintained paved surfaces, and stabilizing graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed for more than 30 days (MDAQMD, 1996).

Attainment Plans

As required by the federal and California Clean Air Acts, air basins or portions thereof have been classified as in either “attainment” or “non-attainment” of each criteria air pollutant, based on whether or not the standards have been achieved. Jurisdictions of non-attainment areas are also required to prepare an air quality attainment plan that includes strategies for achieving attainment. The MDAQMD has several attainment plans that are applicable to the Project including the Triennial Revisions to the 1991 Air Quality Attainment Plan, Mojave Desert Planning Area Federal Particulate Matter Attainment Plan, 2004 Ozone Attainment Plan (State and Federal), and the 2008 MDAQMD Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area)[1] (MDAQMD, 2011).

San Bernardino County General Plan

The following policies identified in the Land Use and Conservation elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

Policy CO 4.1. Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal or as conditions of approval if no environmental document is

[1] Pending USEPA SIP approval.

required, that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:

a) Grading restrictions and/or controls on the basis of soil types, topography, or season;

b) Landscaping methods, plant varieties, and scheduling to maximize successful revegetation;

c) Dust-control measures during grading, heavy truck travel, and other dust generating activities.

Policy D/CO 1.1. Encourage the greater retention of existing native vegetation for new development projects to help conserve water, retain soil in place, and reduce air pollutants.

Policy D/CO 1.4. Reduce disturbances to fragile desert soils as much as practicable in order to reduce fugitive dust. The County shall consider the following in the development of provisions to limit clearing:

a) Parcels of one acre or larger shall not be disturbed or cleared of natural vegetation unless for the installation of building pads, driveways, landscaping, agriculture, or other reasonable uses associated with the primary use of the land, including fire clearance areas.

b) Fire abatement or local clean-up efforts shall be accomplished by mowing or means other than land scraping whenever possible to minimize fugitive dust and windblown sand. When de-brushing or blading is considered the most feasible alternative, additional methods shall be required for erosion control.

c) The County Office of Building and Safety may issue permits for further grading or clearance of vegetation subject to proper review.

San Bernardino County Code

San Bernardino County Municipal Code Section 83.01.040, *Air Quality*, identifies the following standards that would be applicable to the Project (San Bernardino County, 2012):

(c) Diesel Exhaust Emissions Control Measures. The following emissions control measures shall apply to all discretionary land use projects approved by the County on or after January 15, 2009:

(1) On-Road Diesel Vehicles. On-road diesel vehicles are regulated by the State of California Air Resources Board.

(2) Off-Road Diesel Vehicle/Equipment Operations. All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:

(A) Off-road vehicles/equipment shall not be left idling on site for periods in excess of five minutes. The idling limit does not apply to:

(I) Idling when queuing;

(II) Idling to verify that the vehicle is in safe operating condition;

(III) Idling for testing, servicing, repairing, or diagnostic purposes;

(IV) Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane);

(V) Idling required to bring the machine system to operating temperature; and

(VI) Idling necessary to ensure safe operation of the vehicle.

(B) Use reformulated ultra low-sulfur diesel fuel in equipment and use equipment certified by the U.S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.

(C) Maintain engines in good working order to reduce emissions.

(D) Signs shall be posted requiring vehicle drivers to turn off engines when parked.

(E) Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District, or the California Air Resources Board.

(F) Provide temporary traffic control during all phases of construction.

(G) On-site electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.

(H) Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.

(I) Contractors shall use ultra low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.

(J) Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.

3.2.4 Analytical Methodology

The analysis of potential air resource-related impacts of the Proposed Action and alternatives is based on technical information associated with criteria pollutant estimates, public health risk, and cumulative impacts that would be generated during the construction, operation, maintenance, and decommissioning phases of the Project, and the implementation of mitigation that would avoid or minimize potential impacts.

As part of the BLM and County permit application processes, the Applicant provided air pollutant emissions estimates for activities that would be associated with the Project (Pan Environmental, Inc., 2013; included as Appendix D of this PA/EIS/EIR). The emission estimates were independently reviewed and supplemented where appropriate by the BLM and County's consultant, Environmental Science Associates (ESA). Project emissions were estimated by the Applicant's consultant using the California Emissions Estimator Model version 2011.1.1 (CalEEMod)

developed by the SCAQMD. The model estimates daily emissions for both summer and winter, as well as annual emissions.

3.2.4.1 Construction Emissions Estimates

The emissions estimates are based on the proposed construction schedule and the required types and duration of use of equipment for the following phases of construction: Phase 1- site preparation, including site clearance and grading, and grading of Rasor Road; Phase 2 - solar array construction and assembly; and Phase 3 - substation and other facilities construction. The emissions estimates were modeled based on the assumption that each of the three construction phases would begin in July 2014, and that Phase 1 would be completed in approximately 1.5 years (approximately 453 working days) and Phases 2 and 3 would be completed in approximately 2 years (approximately 604 working days). Construction of the Proposed Action would occur over a period of approximately 24 to 30 months depending on a wide range of variables, including scheduling, permitting, work conditions, and availability of workers, equipment, and materials; however, a compressed construction duration of 24 months was conservatively used in the model analysis.

The Applicant's emissions estimates are based on a total disturbance area associated with Project construction of approximately 2,492 acres and the total area to be graded would be approximately 1,155 acres. Subsequent to the preparation of the Applicant's emission estimates, the Proposed Action revised to include a total disturbance area of approximately 2,557 acres; therefore, the Phase 1 annual construction emissions were updated by scaling the Applicant-estimated Phase 1 annual construction emissions based on the current proposed disturbed acreage compared to the disturbed acreage used for the Applicant's emission estimates. This resulted in an increase in Phase 1 construction emissions of approximately 2.5 percent compared to the Applicant's estimate. The maximum daily grading area would be approximately 80 acres. The maximum daily emissions were estimated assuming a worst-case daily equipment usage that includes concurrent activities associated with each of the three construction phases for the Project.

Construction activities would include the use of off-road equipment, such as dozers, graders, loaders, cranes, etc. CalEEMod assumes all of the off-road construction equipment would operate on diesel fuel. The model uses default equipment lists based on total project acreage; however, for large-acreage projects, SCAQMD recommends the use of site-specific construction schedules and equipment lists. Therefore, the types and duration of use for construction equipment were estimated using quarterly data obtained from construction of a similar large-scale solar PV project called the California Valley Solar Ranch (CVSR) project. The Applicant has indicated that these data provide a conservative estimate of annual emissions because (i) the CVSR project involved more grading than is proposed for this Project and (ii) the equipment use was estimated using the highest CVSR project quarterly data (Panorama Environmental, Inc., 2013). The equipment use estimates include a wide variety of pieces of equipment with specific model types and amounts identified based on the actual equipment used for the CVSR project. Each piece of equipment has a specific function and some of the equipment is specialized and would operate well under 8 hours per day even under maximum use conditions.

The CalEEMod software program calculates the exhaust emissions based on CARB OFFROAD2007 equipment emission and load factors. However, subsequent to the release of CalEEMod, CARB released an updated OFFROAD2011 model that includes more accurate equipment load factors. The load factors from CARB's OFFROAD2011 were used instead of the model's default load factors.

For on-road vehicle emissions, CalEEMod estimates emissions based on emission factors derived from CARB's EMFAC2007 model. The CalEEMod default trip data were replaced with the following Project-specific vehicle trip and traveling distance information: 500 passenger vehicle round trips per day at 50 miles per trip for commuting workers; and 200 heavy-duty diesel truck round trips per day at 90 miles per trip for trucks hauling materials and equipment to the site. CalEEMod incorporates methodologies identified in USEPA's emissions estimation guidance document AP-42 to estimate fugitive dust emissions generated during site grading and vehicles traveling on paved and unpaved roads.

As mentioned previously, the maximum daily emissions estimates assume concurrent activities for the three construction phases. The peak construction day was assumed to be in August 2014. Peak daily construction activity data used as inputs to CalEEMod are presented in Tables A.1-1 through A.1-5 in Appendix A of the Applicant's air pollutant emissions report (Pan Environmental, Inc., 2013). The average project construction activity data were used to estimate annual emissions for construction years 2014, 2015, and 2016. The Project data related to annual construction activities used in the modeling analysis are presented in Tables A.2-1 through A.2-5 in Appendix A of the Applicant's air pollutant emissions report (Pan Environmental, Inc., 2013).

It should be noted that the Applicant has committed to implementing the Applicant Proposed Measures (APMs) identified in Section 3.2.5 to reduce air pollutant emissions that would be generated during Project construction activities. The construction equipment exhaust and fugitive dust emissions presented in Section 3.2.6 were estimated under the assumption that the air quality APMs identified in Section 3.2.5 would be implemented.

3.2.4.2 Operation and Maintenance Emissions Estimates

Operation and maintenance-related criteria pollutant emissions, including fugitive dust, would be generated from on-site equipment and on-site and off-site vehicle use. The Applicant's consultant used CalEEMod to estimate criteria air pollutant emissions for the first year of Project operation, which was assumed to be in 2015. Project-specific data provided by the Applicant (including water use data, vehicle trips, and building square footage) and CalEEMod default values (e.g., emission factors) were used as input data.

The CalEEMod air emissions modeling was conducted under the assumption that the Project would require up to 38 workers and up to 22 on-site water truck trips per day to control fugitive dust by watering the site and unpaved roads twice daily and to perform pressure washing of solar panels. Since the modeling results were prepared, the Applicant has adjusted the number of permanent employees to 40; however, the additional emissions that would result from up to two more vehicle trips would be minor, and no new modeling has been conducted. Because

CalEEMod does not calculate fugitive dust emission reductions associated with a watering program for operational phases, the Applicant's consultant manually applied a 55 percent reduction rate to the total modeled emissions for PM_{10} and $PM_{2.5}$ to estimate emissions under an operation-related watering program to control fugitive dust. The model estimates daily emissions for both summer and winter, as well as annual emissions. To present the maximum estimated daily emissions, the higher emissions between summer and winter are selected. Implementation of MDAQMD Rule 403.2 was included in the emission estimates.

The Applicant's emissions estimates do not include emissions that would be associated with periodic testing and maintenance of the proposed emergency (standby) generator. Therefore, these emissions were estimated by the BLM and County's consultant (ESA, 2013). For a conservative analysis, it was assumed that the standby generator would be diesel-powered. Based on the size of the proposed diesel storage tank (i.e., 500 gallons), it is assumed that the generator power rating would range between 250 horsepower (hp) and 500 hp. Emission factors for "other general industrial equipment" were obtained from CARB's OFFROAD2011 emissions model to represent the emissions of the standby generator. For the purposes of the emissions estimates, it is assumed that the standby generator would be operated no more than 50 hours per year for testing and maintenance, and testing would occur once each month.

3.2.4.3 Public Health Risk

The primary hazardous air pollutant emission associated with the Project and alternatives would be DPM emissions from construction equipment and vehicle exhaust. Small quantities of other hazardous air pollutants would be associated with gasoline-fueled vehicles also operating on-site during construction. The location of hazardous pollutant emissions from construction equipment operation would vary across the Project ROW over the construction and decommissioning periods, and thus would not be in a fixed location for extended periods of time.

The closest sensitive receptors are residences located adjacent to the service station on Rasor Road, approximately 230 feet southwest of the southern border of the requested ROW; however, with the exception of the Rasor Road reroute, which is approximately 600 feet at its closest location to the residences, the closest Project component is a building that would be constructed at a distance of over 1,200 feet from the residences. The vast majority of Project components would be constructed more than a mile from the nearest residences. With regard to long-term operation and maintenance, on-site sources of hazardous air pollutant emissions would primarily be limited to vehicle use and periodic emergency standby generator testing. A full health risk assessment is not warranted for the Project pursuant to MDAQMD guidelines (MDAQMD, 2011); therefore, health risks associated with short-term construction activities and long-term operation and maintenance of the Project are evaluated qualitatively.

3.2.4.4 Decommissioning Emissions Estimates

It is assumed that decommissioning-related air pollutant emissions would be substantially similar to the construction-related emission estimates described above.

3.2.4.5 Impact Analysis

Independent of NEPA, federal Clean Air Act Section 176 requires federal agencies that are funding, permitting, or approving an activity to ensure the activity conforms to the applicable SIP adopted to eliminate or reduce air quality violations (42 USC §7506). The southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is classified as a severe non-attainment area for the federal 8-hour ozone standard. The Project area also is classified as a moderate non-attainment area for the federal PM_{10} standard (CARB, 2013a). Therefore, the applicable federal Clean Air Act conformity *de minimis* levels of 25 tons per year for ROG and NO_x and 100 tons per year for PM_{10} are used as measures as to whether the Proposed Action or one of the alternatives could result in an exceedance of a federal AAQSs.

The study area is also classified as a non-attainment area for the state 1-hour and 8-hour ozone AAQSs as well as the 24-hour PM_{10} AAQS. The southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is classified as a non-attainment area for the state $PM_{2.5}$ annual standard. Table 3.2-4 identifies CEQA air quality significance thresholds adopted by MDAQMD. Project-related construction and operation and maintenance mass exhaust and fugitive dust emissions are compared to MDAQMD daily and annual thresholds, shown in Table 3.2-4, to determine whether the Project or one of the alternatives could result in an exceedance of a California AAQS.

TABLE 3.2-4
MDAQMD AIR QUALITY THRESHOLDS

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO_x)	25	137
Volatile Organic Compounds (ROG)	25	137
Oxides of Sulfur (SO_x)	25	137
Respirable Particulate Matter (PM_{10})	15	82
Fine Particulate Matter ($PM_{2.5}$)	15	82
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3

SOURCE: MDAQMD, 2011

3.2.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to reduce air pollutant emissions that would be generated by the Project (Soda Mountain Solar, LLC, 2013).

APM 1: The Applicant shall use periodic watering for short-term stabilization of disturbed areas to minimize visible fugitive dust emissions. Use of a water truck to maintain surface moisture on disturbed areas and surface application of water during visible dusting episodes shall be considered sufficient to maintain compliance.

APM 2: The Applicant shall apply BMPs to prevent Project-related visible bulk materials transport (trackout) onto paved surfaces. BMPs may include, but not be limited to, the following:

a. Use of wheel-washers (or equivalent) installed at all access points and laydown areas where trackout onto paved public roads could occur

b. Construction of stabilized construction site entrance/exit areas

c. Implementation of regular street sweeping/cleaning of paved surfaces

d. Installation of corrugated steel panels at all site exits

APM 3: The Applicant shall cover haul vehicles loaded with earthen materials while operating on publicly maintained paved surfaces.

APM 4: The Applicant shall stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 14 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.

APM 5: The Applicant shall clean up Project-related visible bulk materials transport (trackout) or spills on publicly maintained paved surfaces within 24 hours.

APM 6: The Applicant shall discontinue non-essential earth-moving activities under high wind conditions when wind speeds exceed 25 miles per hour and those activities result in visible dust plumes. All grading activities shall be suspended when wind speeds are greater than 30 miles per hour.

APM 7: The Applicant shall limit the speed of vehicles traveling on unpaved roads and disturbed areas to 15 miles per hour.

APM 8: The Applicant shall apply water to all unpaved roads and unpaved parking areas actively used during construction, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.

APM 9: The Applicant shall use off-road construction diesel engines that meet the Tier 3 California Emission Standards for Off-road Compression-Ignition Engines unless such engine is unavailable for a particular item of equipment. If a Tier 3 engine is unavailable, that engine shall be equipped with retrofit controls providing nitrogen oxides and particulate matter emissions equivalent to a Tier 3 engine.

APM 10: The Applicant shall apply Level 3 diesel particulate filters to diesel engines of off-road construction equipment.

3.2.6 Direct and Indirect Effects

3.2.6.1 Alternative A: Proposed Action

Construction

Criteria Pollutant Emissions

Table 3.2-5 summarizes the estimated maximum daily criteria pollutant emissions that would be generated within the MDAB during construction of the Project. The maximum daily emissions for all criteria pollutants would occur in 2014. The emissions calculations include reductions that would result from implementation of APMs 1 through 10 (see Section 3.2.5). As shown in Table 3.2-5, the maximum daily emissions estimated for ROG, SO_x, and $PM_{2.5}$ are below the respective MDAQMD thresholds. The associated construction impacts would be adverse, but would not be substantial. However, emissions of NO_x, CO, and PM_{10} would exceed the respective maximum daily MDAQMD thresholds. Therefore, it can be concluded that the Project would result in or contribute to a short-term exceedance of the state ozone, CO, and PM_{10} AAQSs.

TABLE 3.2-5
ESTIMATED MAXIMUM DAILY CONSTRUCTION EMISSIONS FOR PROPOSED ACTION

Phase	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Phase 1	15.50	128.36	121.28	0.28	117.46	13.92
Phase 2	55.47	308.32	286.42	0.65	149.65	23.21
Phase 3	16.92	164.68	141.39	0.39	146.82	20.99
Total	**87.89**	**601.37**	**549.09**	**1.33**	**413.93**	**58.12**
MDAQMD Thresholds	137	137	548	137	82	82

NOTE: The higher emissions between summer and winter are selected.

SOURCE: Pan Environmental, Inc., 2013

The annual criteria pollutant emissions that would be generated within the MDAB during each calendar year of the 24 months of Project construction have been estimated using the methodologies described above in Section 3.2.4. As shown in Table 3.2-6, annual emissions of ROG and PM_{10} would be below the respective federal *de minimis* level. Therefore, it can be concluded that Project construction would not likely result in or contribute to an exceedance of a federal AAQS for ROG or PM_{10}. However, emissions of NO_x would exceed the federal *de minimis* level of 25 tons per year. Therefore, it can be concluded that Project construction could result in or contribute to an exceedance of the federal AAQS for ozone. For information related to Project emissions subject to the General Conformity Rule, refer to the *General Conformity Determination* discussion below.

With regard to comparing annual emissions relative to the MDAQMD annual thresholds, emissions of NO_x and PM_{10} would exceed the respective maximum MDAQMD thresholds in 2015 and in 2014 and 2015, respectively. Therefore, it can be concluded that the Project would result in or contribute to a short-term exceedance of the state ozone and PM_{10} AAQSs.

TABLE 3.2-6
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR PROPOSED ACTION

Year	Phase	Estimated Annual Air Pollutant Emissions (tons/year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2014	Phase 1	0.50	2.57	4.87	0.00	4.09	0.75
	Phase 2	4.08	15.46	17.82	0.03	6.58	1.19
	Phase 3	0.62	3.15	5.46	0.01	5.44	0.51
	Total	**5.20**	**21.18**	**28.15**	**0.05**	**16.11**	**2.45**
2015	Phase 1	0.91	4.76	8.60	0.02	6.72	0.99
	Phase 2	8.06	30.55	34.76	0.07	12.03	1.79
	Phase 3	1.21	6.16	10.28	0.02	10.76	0.98
	Total	**10.18**	**41.47**	**53.64**	**0.11**	**29.51**	**3.76**
2016	Phase 1	0.00	0.00	0.00	0.00	0.00	0.00
	Phase 2	3.41	12.96	14.6	0.02	5.7	1.09
	Phase 3	0.50	2.60	4.2	0.01	4.57	0.42
	Total	**3.91**	**15.56**	**18.79**	**0.04**	**10.27**	**1.51**
Federal *de minimis* level		25	25	---	---	100	---
MDAQMD Thresholds		25	25	100	25	15	15

SOURCE: Pan Environmental, Inc., 2013 and ESA, 2013

Toxic Air Contaminants

MDAQMD requirements for health risk assessments categorize project sites by land use type and define the distance from the project site within which sensitive receptors must be considered for increased health risk. The potential health risk impact radius for sensitive receptors near "any industrial project" is within 1,000 feet of the project. Though solar power generation projects are not specifically identified as a type of industrial project, this worst case radius was assumed as the criterion for determining potential risks from exposure to DPM during construction.

The only portion of the Project that would be constructed within 1,000 feet of a sensitive receptor (i.e., residences) would be short segments (i.e., approximately 500 feet) of the Rasor Road realignment and the Desert Tortoise/security fence; however, construction of these short segments would proceed in a linear fashion and would not be expected to take more than one week to complete. The next closest Project component to the residences would be the cluster of storage buildings that would be at least 1,300 feet northeast of the residences. The nearest solar array to the residences would be at a distance of approximately 2,660 feet (0.5 mile), and the vast majority of the Project would be constructed more than 1 mile from the residences. In addition to on-site construction activities, there would be up to 200 daily diesel truck roundtrips that would pass within 300 feet of the residences at the southern entrance to the site.

DPM generated from construction would be limited to the 24- to 30-month construction period and would be dispersed throughout the requested ROW; therefore, construction-related emissions would not be concentrated near the residences. Given the limited duration of exposure and the spatial

distribution of emissions, it was determined that there would be little health risk to the nearby residences from exposure to construction-related DPM emissions.

Operation and Maintenance

Criteria Pollutants

Tables 3.2-7 and 3.2-8 show the estimated maximum daily and annual criteria pollutant emissions that would be generated each year during operation and maintenance. The annual and maximum daily emissions of all the criteria pollutants are below the respective federal *de minimis* levels and the MDAQMD thresholds; therefore, impacts associated with operation and maintenance would not be expected to result in or contribute to an exceedance of a federal or state AAQS. It should be noted that the Applicant-estimated PM_{10} and $PM_{2.5}$ emissions presented in Tables 3.2-7 and 3.2-8 are based on a 55 percent reduction for fugitive dust to account for a fugitive dust control program that would include watering the site and unpaved access roads twice daily (Pan Environmental, Inc., 2013). However, the Applicant has not formally committed to implementing an operation-based watering program to control fugitive dust. Without implementation of long-term operation-based watering program to control fugitive dust, maximum daily emissions of PM_{10} would be as high as 155 pounds, and annual emission of PM_{10} would be as high as 22 tons, which would exceed the MDAQMD daily and annual thresholds potentially causing an exceedance of state PM_{10} AAQSs. Therefore, to ensure Project operation and maintenance would not result in an exceedance of state PM_{10} AAQSs and to formalize the Applicant's intent to water the site and unpaved access roads, Mitigation Measure 3.2-1 is recommended (see Section 3.2.8).

TABLE 3.2-7
ESTIMATED MAXIMUM DAILY OPERATION AND MAINTENANCE EMISSIONS FOR PROPOSED ACTION

Emissions Source	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area	0.37	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00
Mobile	1.25	11.13	20.84	0.05	69.91	6.95
Emergency Generator Testing*	0.43	5.23	10.00	0.02	0.20	0.19
Total	**2.05**	**16.37**	**30.85**	**0.07**	**70.11**	**7.14**
MDAQMD Thresholds	137	137	548	137	82	82

NOTE: The higher emissions between summer and winter are selected.

* Emissions estimated by ESA. OFFROAD2011 does not include emission factors for CO or SO_x; therefore, CO and SO_x emissions are estimated based on the general assumption that the ratio of NO_x, CO, and SO_x emissions for mobile emissions sources would be similar to that for emergency generator testing.

SOURCE: Pan Environmental, Inc., 2013 and ESA, 2013

TABLE 3.2-8
ESTIMATED ANNUAL OPERATION AND MAINTENANCE EMISSIONS FOR PROPOSED ACTION

Emissions Source	Estimated Annual Air Pollutant Emissions (tons/year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area	0.07	0.00	0.00	0.00	0.00	0.00
Mobile	0.19	1.52	3.10	0.01	10.04	1.00
Emergency Generator Testing*	0.00	0.03	0.06	0.00	0.00	0.00
Total	**0.26**	**1.55**	**3.16**	**0.01**	**10.04**	**1.00**
Federal *de minimis* level	25	25	---	---	100	---
MDAQMD Thresholds	25	25	100	25	15	15

NOTE:

* Emissions estimated by ESA. OFFROAD2011 does not include emission factors for CO or SO_x; therefore, CO and SO_x emissions are estimated based on the general assumption that the ratio of NO_x, CO, and SO_x emissions for mobile emissions sources would be similar to that for emergency generator testing.

SOURCE: Pan Environmental, Inc., 2013 and ESA, 2013.

Toxic Air Contaminants

Long-term annual operation and maintenance would result in a negligible amount of DPM emissions (i.e., less than 0.04 ton per year) primarily associated with on-site water truck usage. These emissions would be dispersed over the requested ROW, resulting in very low pollutant concentrations at nearby residence locations. Therefore, DPM emissions exposure would present little risk during operation and maintenance.

Decommissioning

At the end of the 30-year term of the ROW grant, operation and maintenance would cease, associated facilities would be decommissioned and dismantled, and the Project site would be restored over a period of approximately 24 months. Decommissioning activities could generate temporary air pollutant emissions similar to those that would occur during construction (see above).

General Conformity Determination

As stated in Section 3.2.2.2, the entire Project area is designated non-attainment of the federal PM_{10} 24-hour standard, and the southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is designated as non-attainment of the federal 8-hour ozone standard (see Figure 3.2-1 for an illustration of the portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area). The Project would be subject to the general conformity regulations if Project emissions generated within the non-attainment areas would exceed the applicable *de minimis* levels.

The applicable federal general conformity *de minimis* level for moderate PM_{10} non-attainment areas is 100 tons per year, and because the entire Project area is located within the non-attainment area, all Project-related PM_{10} emissions are compared to the PM_{10} *de minimis* level. The

applicable federal general conformity *de minimis* levels for the ozone precursors ROG and NO_x are 25 tons per year each. As stated in 40 CFR 93.150, "If an action would result in emissions originating in more than one non-attainment or maintenance area, the conformity must be evaluated for each area separately." Therefore, the air quality conformity analysis with regard to the federal ozone standard was performed for only the portion of the Project that would be in the federal ozone non-attainment area. Approximately 56 percent of the Project construction activities would take place within the federal ozone non-attainment area (see Figure 3.2-1).

Annual emissions of the Project in the non-attainment areas were calculated by multiplying the total estimated Project annual construction and operation emissions by the percentage of the Project area that is in the respective non-attainment area (i.e., 56 percent for ROG and NO_x, and 100 percent for PM_{10}). Total annual emissions of ROG, NO_x, and PM_{10} that would be generated during construction and operation are presented above in Tables 3.2-6 and 3.2-8. Table 3.2-9 shows the estimated Project annual emissions of ROG, NO_x, and PM_{10} that are projected to be generated within the federal non-attainment areas.

As indicated in Table 3.2-9, the ROG, NO_x, and PM_{10} emissions that would be generated by Project-related construction and operation activities within the federal non-attainment areas would be not exceed the General Conformity *de minimis* levels. Therefore, the Project would conform to the SIP and the BLM is exempt from performing a conformity determination.

TABLE 3.2-9
ESTIMATED ANNUAL EMISSIONS GENERATED WITHIN FEDERAL NON-ATTAINMENT AREAS

	Estimated Annual Emissions (tons/year)		
Source	**ROG***	**NO_x***	**PM_{10}**
2014 Construction Emissions	2.91	11.81	16.11
2015 Construction Emissions	5.70	23.17	29.51
2016 Construction Emissions	2.19	8.71	10.27
Annual Operational Emissions	0.15	0.87	10.04
General Conformity *de minimis* Levels	25	25	100
Exceed *de minimis* Levels?	No	No	No

NOTE:

* Emissions for ROG and NO_x represent Project emissions that would be generated only in the Western Mojave Desert Ozone Non-attainment Area.

SOURCE: Pan Environmental, Inc., 2013

Federal Class I Air Quality Protection Areas

The Project site is approximately 70 miles north of the nearest Federal Class I air quality protection area, which is Joshua Tree National Park (USEPA, 2012). Given the Project site's proximity to Joshua Tree National Park and the fact that the prevailing winds in the MDAB are from the west and southwest, emissions that would be associated with the Proposed Action or one of the alternatives would not be expected to affect air quality at Joshua Tree National Park.

3.2.6.2 Alternative B

Construction and Decommissioning

Alternative B would consist only of the East and South arrays as described for the Proposed Action. The North Array and one groundwater well would not be constructed. The overall workforce and equipment inventory that would be associated with construction of Alternative B would be expected to be similar to that of the Proposed Action; therefore, the maximum daily construction emissions for Alternative B would be similar to the maximum daily construction emissions for the Proposed Action (see Table 3.2-5), which could result in or contribute to an exceedance of the state ozone, CO, and/or PM_{10} 24-hour AAQSs. However, the construction duration for Alternative B would be approximately 6 months less than under the Proposed Action as a result of the elimination of the North Array.

The estimated annual construction emissions for Alternative B were estimated by scaling the emissions estimated for the Proposed Action based on attributes of Alternative B compared to attributes of the Proposed Action. Alternative B total emissions for Phases 1, 2, and 3 were scaled to 75 percent, 74 percent, and 75 percent of Proposed Action emissions based on total acres of disturbance, total MW capacity, and the total months of construction, respectively. Table 3.2-10 summarizes annual construction emission estimates for Alternative B. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 would be approximately 5 to 11 percent less compared to the Proposed Action, and there would be no construction emissions generated in 2016.

TABLE 3.2-10
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE B

Year	Phase	Estimated Annual Air Pollutant Emissions (tons/year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2014	1	0.50	2.57	4.87	0	4.09	0.75
	2	4.08	15.46	17.82	0.03	6.58	1.19
	3	0.62	3.15	5.46	0.01	5.44	0.51
	Total	**5.20**	**21.18**	**28.15**	**0.05**	**16.11**	**2.45**
2015	1	0.57	2.99	5.40	0.01	4.22	0.62
	2	7.86	29.78	33.89	0.07	11.73	1.75
	3	1.21	6.16	10.28	0.02	10.76	0.98
	Total	**9.64**	**38.93**	**49.57**	**0.10**	**26.71**	**3.35**
2016	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Federal *de minimis* level		25	25	---	---	100	---
MDAQMD Thresholds		25	25	100	25	15	15

SOURCES: Pan Environmental, Inc., 2013; ESA, 2013.

Although annual construction emissions would be reduced in 2015 and 2016 under Alternative B compared to the Proposed Action, total emissions of NO_x would continue to exceed the federal *de minimis* level of 25 tons per year in 2015. Therefore, construction of Alternative B could result in or contribute to an exceedance of the federal AAQS for ozone. In addition, emissions of NO_x and PM_{10} would exceed the respective maximum MDAQMD thresholds in 2015 and in 2014 and 2015, respectively. Therefore, it can be concluded that construction and decommissioning of Alternative B would result in or contribute to a short-term exceedance of the state ozone and PM_{10} AAQSs.

Operation and Maintenance

Emissions associated with operation and maintenance of Alternative B would also be reduced compared to the Proposed Action because the reduced scale would require less annual maintenance. Area, energy, and mobile source emissions were scaled 74 percent based on total MW capacity of Alternative B compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. See Table 3.2-11 for a summary of emissions from operation and maintenance of Alternative B. The PM_{10} and $PM_{2.5}$ emissions presented in Table 3.2-11 are based on a 55 percent reduction for fugitive dust to account for a fugitive dust control program that would include watering the site and unpaved access roads twice daily. Without implementation of long-term operation-based watering program to control fugitive dust, maximum daily emissions of PM_{10} would be as high as 115 pounds, which would exceed the MDAQMD daily threshold, potentially causing an exceedance of state PM_{10} AAQSs. Therefore, to reduce the potential for Alternative B operation and maintenance to result in an exceedance of state PM_{10} AAQSs, Mitigation Measure 3.2-1 is recommended (see Section 3.2.8). Overall, Alternative B would have similar but reduced adverse effects to air resources as the Proposed Action.

TABLE 3.2-11
ESTIMATED MAXIMUM DAILY OPERATION AND MAINTENANCE EMISSIONS FOR ALTERNATIVE B

Emissions Source	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area	0.27	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00
Mobile	0.92	8.21	15.37	0.04	51.55	5.13
Emergency Generator Testing*	0.43	5.23	10	0.02	0.2	0.19
Total	**1.62**	**13.44**	**25.38**	**0.06**	**51.75**	**5.32**
MDAQMD Thresholds	137	137	548	137	82	82

NOTE: The higher emissions between summer and winter are selected.

* OFFROAD2011 does not include emission factors for CO or SO_x; therefore, CO and SO_x emissions are estimated based on the general assumption that the ratio of NO_x, CO, and Sox emissions for mobile emissions sources would be similar to that for emergency generator testing.

SOURCES: Pan Environmental, Inc., 2013; ESA, 2013.

Toxic Air Contaminants

The only portion of Alternative B that would be constructed within 1,000 feet of a sensitive receptor (i.e., residences) would be short segments of the BLM Proposed Rasor Road Realignment and the Desert Tortoise/security fence (i.e., approximately 300 feet and 500 feet, respectively); however, construction of these short segments would proceed in a linear fashion and would not be expected to take more than two weeks to complete. The next closest Alternative B component to the residences would be the cluster of storage buildings that would be at least 1,300 feet northeast of the residences. The nearest solar array to the residences would be at a distance of approximately 2,660 feet (0.5 mile), and the vast majority of Alternative B would be constructed more than 1 mile from the residences. In addition to on-site construction activities, there would be up to 200 daily diesel truck roundtrips that would pass within 300 feet of the residences at the southern entrance to the site. Long-term annual operation and maintenance of Alternative B would result in a negligible amount of DPM emissions (i.e., less than 0.03 ton per year) primarily associated with on-site water truck usage. Construction and operation-related emissions would not be concentrated near the residences. Given the limited duration of exposure and the spatial distribution of emissions, Alternative B would result in little health risk to the nearby residences from exposure to DPM emissions.

General Conformity Determination

With regard to General Conformity, the portion of Alternative B that would be within the Western Mojave Desert Ozone Non-attainment Area would be substantially the same as the Proposed Action, with the only exception being an additional approximately 0.5 mile of the BLM Proposed Rasor Road Realignment under Alternative B compared to the Proposed Action. The additional 0.5 mile of road realignment would be expected to generate less than 1 additional ton of NO_x compared to the Proposed Action (see Table 3.2-9). The amount of construction activities in the federal PM_{10} non-attainment area would be reduced compared to the Proposed Action. Therefore, emissions of ROG, NO_x, and PM_{10} that would be generated by Alternative B-related construction and operation activities within the federal non-attainment areas would not exceed the General Conformity *de minimis* levels. Therefore, Alternative B would conform to the SIP and the BLM would be exempt from performing a conformity determination.

3.2.6.3 Alternative C

Construction and Decommissioning

Alternative C would consist of only the North and South arrays as described for the Project and the East Array and one groundwater well would not be constructed. The overall workforce and equipment inventory that would be associated with construction of Alternative C would be expected to be similar to that of the Proposed Action; therefore, the maximum daily construction emissions for Alternative C would be similar to the maximum daily construction emissions for the Proposed Action (see Table 3.2-5), which could result in or contribute to an exceedance of the state ozone, CO, and/or PM_{10} 24-hour AAQSs. However, the construction duration for Alternative C would be approximately 4 months shorter than under the Proposed Action as a result of the elimination of the East Array.

The annual construction emissions for Alternative C were estimated by scaling the emissions estimated for the Proposed Action based on attributes of Alternative C compared to attributes of the Proposed Action. Alternative C total construction emissions for Phases 1, 2, and 3 were scaled to 83 percent of Proposed Action construction emissions based on total acres of disturbance, total MW capacity, and total months of construction, respectively. Table 3.2-12 summarizes annual construction emission estimates for Alternative C. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 would be approximately 2 to 7 percent less compared to the Proposed Action, and emissions during 2016 would be approximately 67 percent less compared to the Proposed Action.

TABLE 3.2-12
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE C

Year	Phase	Estimated Annual Air Pollutant Emissions (tons/year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2014	1	0.50	2.57	4.87	0	4.09	0.75
	2	4.08	15.46	17.82	0.03	6.58	1.19
	3	0.62	3.15	5.46	0.01	5.44	0.51
	Total	**5.20**	**21.18**	**28.15**	**0.05**	**16.11**	**2.45**
2015	1	0.68	3.55	6.42	0.02	5.01	0.74
	2	8.06	30.55	34.76	0.07	12.03	1.79
	3	1.21	6.16	10.28	0.02	10.76	0.98
	Total	**9.95**	**40.26**	**51.46**	**0.11**	**27.80**	**3.51**
2016	1	0.00	0.00	0.00	0.00	0.00	0.00
	2	1.12	4.27	4.81	0.01	1.88	0.36
	3	0.17	0.87	1.40	0.00	1.52	0.14
	Total	**1.29**	**5.14**	**6.21**	**0.01**	**3.40**	**0.50**
Federal *de minimis* level		25	25	---	---	100	---
MDAQMD Thresholds		25	25	100	25	15	15

SOURCES: ESA, 2013; Pan Environmental, Inc., 2013.

Although annual construction emissions would be reduced in 2015 and 2016 under Alternative C compared to the Proposed Action, total emissions of NO_x would continue to exceed the federal *de minimis* level of 25 tons per year in 2015. Therefore, construction of Alternative C could result in or contribute to an exceedance of the federal AAQS for ozone. In addition, emissions of NO_x and PM_{10} would exceed the respective maximum MDAQMD thresholds in 2015 and in 2014 and 2015, respectively. Therefore, it can be concluded that construction and decommissioning of Alternative C would result in or contribute to a short-term exceedance of the state ozone and PM_{10} AAQSs.

Operation and Maintenance

Emissions associated with operation and maintenance of Alternative C would also be reduced compared to the Proposed Action because the reduced scale would require less annual

maintenance. Area, energy, and mobile source emissions were scaled 83 percent based on total MW capacity of Alternative C compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. See Table 3.2-13 for a summary of emissions associated with operation and maintenance of Alternative C. The PM_{10} and $PM_{2.5}$ emissions presented in Table 3.2-13 are based on a 55 percent reduction for fugitive dust to account for a fugitive dust control program that would include watering the site and unpaved access roads twice daily. Without implementation of long-term operation-based watering program to control fugitive dust, maximum daily emissions of PM_{10} would be as high as 129 pounds, which would exceed the MDAQMD daily threshold potentially causing an exceedance of state PM_{10} AAQSs. Therefore, to reduce the potential for Alternative C operation and maintenance to result in an exceedance of state PM_{10} AAQSs, Mitigation Measure 3.2-1 is recommended (see Section 3.2.8). Overall, Alternative C would have the similar but reduced adverse effects to air resources as the Proposed Action.

TABLE 3.2-13
ESTIMATED MAXIMUM DAILY OPERATION AND MAINTENANCE EMISSIONS FOR ALTERNATIVE C

Emissions Source	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area	0.31	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00
Mobile	1.04	9.26	17.35	0.04	58.19	5.79
Emergency Generator Testing	0.43	5.23	10	0.02	0.2	0.19
Total	**1.78**	**14.50**	**27.36**	**0.06**	**58.39**	**5.98**
MDAQMD Thresholds	137	137	548	137	82	82

NOTE: The higher emissions between summer and winter are selected.

* OFFROAD2011 does not include emission factors for CO or SO_x; therefore, CO and SO_x emissions are estimated based on the general assumption that the ratio of NO_x, CO, and Sox emissions for mobile emissions sources would be similar to that for emergency generator testing.

SOURCES: Pan Environmental, Inc., 2013; ESA, 2013.

Toxic Air Contaminants

Like the Proposed Action, the only portion of Alternative C that would be constructed within 1,000 feet of a sensitive receptor (i.e., residences) would be short segments (i.e., 500 feet) of the Rasor Road realignment and the Desert Tortoise/security fence; however, construction of these short segments would proceed in a linear fashion and would not be expected to take more than one week to complete. The next closest Alternative C component to the residences would be the cluster of storage buildings that would be at least 1,300 feet northeast of the residences. The nearest solar array to the residences would be at a distance of approximately 2,660 feet (0.5 mile), and the vast majority of Alternative C would be constructed more than 1 mile from the residences. In addition to on-site construction activities, there would be up to 200 daily diesel truck roundtrips that would pass within 300 feet of the residences at the southern entrance to the site. Long-term annual operation and maintenance of Alternative C would result in a negligible amount of DPM emissions (i.e.,

less than 0.03 ton per year) primarily associated with on-site water truck usage. Construction and operation-related emissions would not be concentrated near the residences. Given the limited duration of exposure and the spatial distribution of emissions, implementation of Alternative C would result in little health risk to the nearby residences from exposure to DPM emissions.

General Conformity Determination

With regard to General Conformity, the portion of Alternative C that would be within the Western Mojave Desert Ozone Non-attainment Area would be slightly smaller compared to the Proposed Action, and the amount of construction activities in the federal PM_{10} non-attainment area would be moderately reduced compared to the Proposed Action. Therefore, emissions of ROG, NO_x, and PM_{10} that would be generated by Alternative C-related construction and operation activities within the federal non-attainment areas would be less than identified for the Proposed Action (see Table 3.2-9) and would not exceed the General Conformity *de minimis* levels. Therefore, Alternative C would conform to the SIP and the BLM would be exempt from performing a conformity determination.

3.2.6.4 Alternative D

Construction and Decommissioning

The East and South arrays under Alternative D would be reduced in size compared to the Proposed Action, and Alternative D would not include a realignment of Rasor Road. The overall workforce and equipment inventory that would be associated with construction of Alternative D would be expected to be similar to that of the Proposed Action; therefore, the maximum daily construction emissions for Alternative D would be similar to the maximum daily construction emissions for the Proposed Action (see Table 3.2-5), which could result in or contribute to an exceedance of the state ozone, CO, and/or PM_{10} 24-hour AAQSs. However, the construction duration for Alternative D would be approximately 7 months shorter than under the Proposed Action as a result of the reduced area for the East and South arrays.

The annual construction emissions for Alternative D were estimated by scaling the emissions estimated for the Proposed Action based on attributes of Alternative D compared to attributes of the Proposed Action. Alternative D total construction emissions for Phases 1, 2, and 3 were scaled to 77 percent, 70 percent, and 71 percent of the Proposed Action's Phase 1, 2, and 3 emissions based on total acres of disturbance, total MW capacity, and the total months of construction, respectively. Table 3.2-14 summarizes annual construction emission estimates for Alternative D. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 would be approximately 12 to 16 percent less compared to the Proposed Action, and there would be no construction emissions generated in 2016.

Although annual construction emissions would be reduced in 2015 and 2016 under Alternative D compared to the Proposed Action, total emissions of NO_x would continue to exceed the federal *de minimis* level of 25 tons per year in 2015. Therefore, construction of Alternative D could result in or contribute to an exceedance of the federal AAQS for ozone. In addition, emissions of NO_x and PM_{10} would exceed the respective maximum MDAQMD thresholds in 2015 and in 2014 and

TABLE 3.2-14
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE D

Year	Phase	Estimated Annual Air Pollutant Emissions (tons/year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2014	1	0.50	2.57	4.87	0	4.09	0.75
	2	4.08	15.46	17.82	0.03	6.58	1.19
	3	0.62	3.15	5.46	0.01	5.44	0.51
	Total	**5.20**	**21.18**	**28.15**	**0.05**	**16.11**	**2.45**
2015	1	0.60	3.12	5.65	0.01	4.41	0.65
	2	7.23	27.39	31.17	0.06	10.79	1.61
	3	1.11	5.65	9.42	0.02	9.86	0.90
	Total	**8.94**	**36.16**	**46.24**	**0.09**	**25.06**	**3.16**
2016	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Federal *de minimis* level		25	25	---	---	100	---
MDAQMD Thresholds		25	25	100	25	15	15

SOURCES: ESA, 2013; Pan Environmental, Inc., 2013.

2015, respectively. Therefore, it can be concluded that construction and decommissioning of Alternative D would result in or contribute to a short-term exceedance of the state ozone and PM_{10} AAQSs.

Operation and Maintenance

Emissions associated with operation and maintenance of Alternative D also would be reduced compared to the Proposed Action because the reduced scale would require less annual maintenance. Area, energy, and mobile source emissions were scaled 70 percent based on total MW capacity of Alternative D compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. See Table 3.2-15 for a summary of emissions from operation and maintenance of Alternative D. The PM_{10} and $PM_{2.5}$ emissions presented in Table 3.2-15 are based on a 55 percent reduction for fugitive dust to account for a fugitive dust control program that would include watering the site and unpaved access roads twice daily. Without implementation of long-term operation-based watering program to control fugitive dust, maximum daily emissions of PM_{10} would be as high as 108 pounds, which would exceed the MDAQMD daily threshold potentially causing an exceedance of state PM_{10} AAQSs. Therefore, to reduce the potential for Alternative D operation and maintenance to result in an exceedance of state PM_{10} AAQSs, Mitigation Measure 3.2-1 is recommended (see Section 3.2.8). Overall, Alternative D would have the similar but reduced adverse effects to air resources as the Proposed Action.

TABLE 3.2-15
ESTIMATED MAXIMUM DAILY OPERATION AND MAINTENANCE EMISSIONS FOR ALTERNATIVE D

Emissions Source	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area	0.26	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00
Mobile	0.87	7.77	14.55	0.03	48.82	4.85
Emergency Generator Testing	0.43	5.23	10	0.02	0.2	0.19
Total	**1.56**	**13.01**	**24.56**	**0.05**	**49.02**	**5.04**
MDAQMD Thresholds	137	137	548	137	82	82

NOTE: The higher emissions between summer and winter are selected.

* OFFROAD2011 does not include emission factors for CO or SO_x; therefore, CO and SO_x emissions are estimated based on the general assumption that the ratio of NO_x, CO, and SO_x emissions for mobile emissions sources would be similar to that for emergency generator testing.

SOURCE: Pan Environmental, Inc, 2013 and ESA, 2013.

Toxic Air Contaminants

No portion of Alternative D would be constructed within 1,000 feet of a sensitive receptor (i.e., residences). The closest Alternative D component to the residences would be a construction desert tortoise fence that would be at least 3,800 feet (0.7 mile) northeast of the residences. The nearest solar array to the residences would be at a distance of approximately 5,900 feet (1.1 mile). In addition to on-site construction activities, there would be up to 200 daily diesel truck roundtrips that would pass within 300 feet of the residences at the southern entrance to the site. Long-term annual operation and maintenance of Alternative D would result in a negligible amount of DPM emissions (i.e., less than 0.03 ton per year) primarily associated with on-site water truck usage. Construction and operation-related emissions would not be concentrated near the residences. Given the limited duration of exposure and the spatial distribution of emissions, it was determined that there would be little health risk to the nearby residences under Alternative D from exposure to DPM emissions.

General Conformity Determination

With regard to General Conformity, the portions of Alternative D that would be within the federal non-attainment areas would be substantially less compared to the Proposed Action. Therefore, emissions of ROG, NO_x, and PM_{10} that would be generated by Alternative D-related construction and operation activities within the federal non-attainment areas would be less than those identified for the Proposed Action (see Table 3.2-9) and would not exceed the General Conformity *de minimis* levels. Therefore, Alternative D would conform to the SIP and the BLM would be exempt from performing a conformity determination.

3.2.6.5 Alternative E: No Action/No Project

As described in Section 2.6.1, Alternative E would result in no development on the Project site. If Alternative E was implemented, no changes would occur, and the existing environmental setting would be maintained. As a no-development alternative, Alternative E would result in no changes to existing air resources; therefore, no impact would occur.

3.2.6.6 Alternative F: CEQA No Project

Under Alternative F, a solar PV energy facility could be developed as described for the Proposed Action and Alternatives B, C, and D, but it would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. Alternative F could generate a similar amount of emissions as disclosed for the Proposed Action or Alternatives B, C, or D depending on the alternative approved by the BLM. However, because Alternative F would require an off-site source of water, it would require an additional 30 truck trips (60 one-way trips) per day to deliver up to 300,000 gallons per day to the site. It is assumed that the trucks would be 10,000-gallon capacity water tanker trucks.

Construction and Decommissioning

Emissions that would result from construction-related water truck trips were estimated by the Applicant's air quality consultant and peer reviewed and revised by the BLM's and County's environmental consultant, ESA (see Table 3.2-16). Upon review of the water truck emissions estimates, ESA determined that the Applicant's exhaust emissions presented for ROG, NO_x, CO, and SO_x were substantially underestimated. Therefore, Table 3.2-16 includes revised emissions estimates that were developed using EMFAC2011 emission factors for ROG, NO_x, CO, and SO_x. The emissions presented in Table 3.2-16 represent only emissions that would be generated by importing water to the Project site, which would be in addition to other construction-related emissions associated with the solar PV energy facility.

TABLE 3.2-16
ESTIMATED MAXIMUM DAILY EMISSIONS FOR IMPORTING WATER FOR CONSTRUCTION

Year	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Water Truck Emissions	0.55	15.00	2.54	0.02	30.38	2.96

NOTE: Emissions of PM_{10} and $PM_{2.5}$ were estimated under the assumption that dust control measures similar to APMs 1 through 8 would be implemented.

SOURCES: Pan Environmental, Inc., 2013; ESA, 2013.

Operation and Maintenance

With regard to long-term operation and maintenance, Alternative F would include additional emissions from up to 11 truck trips (22 one-way trips) per day to deliver water to the site for dust control, panel washing, and potable uses. Emissions that would be associated with the operational

water deliveries are summarized in Table 3.2-17. The emissions presented in Table 3.2-17 represent only emissions that would be generated by importing water to the Project site, which would be in addition to other operation-related emissions associated with the solar PV energy facility.

TABLE 3.2-17
ESTIMATED MAXIMUM DAILY EMISSIONS FOR IMPORTING WATER FOR OPERATION AND MAINTENANCE

Year	Estimated Annual Air Pollutant Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Water Trucks	0.38	4.95	1.89	0.01	14.17	1.56

SOURCE: Pan Environmental, Inc., 2013.

3.2.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, no ROW grant and no groundwater well permit would be authorized, and the CDCA Plan would be amended to designate the requested ROW area as unsuitable for solar development. The existing environmental setting described in Section 3.2.2 would be maintained. Alternative G would result in no changes to existing air resources; therefore, no impact would occur.

3.2.7 Cumulative Effects

The geographic scope considered for potential cumulative impacts to regional air resources is the MDAB. The temporal scope considered for potential cumulative impacts to regional air resources is from the start of construction, through the end of the 30-year term of the ROW grant. If the Proposed Action or an alternative would result in an increase in a criteria pollutant that has an existing adverse cumulative effect (i.e., the MDAB is classified as non-attainment of the criteria pollutant) and the increase would be more than the respective federal *de minimis* level or MDAQMD threshold, when combined with the emissions associated with other past, present, or reasonably foreseeable future actions, the Proposed Action or alternative would be considered to contribute to a significant cumulative effect to regional air resources. With regard to cumulative effects on sensitive receptors, the geographic scope includes any past, present, or reasonably foreseeable future actions located within 1,000 feet of a sensitive receptor that is located within 1,000 feet of the Proposed Action or an alternative.

As disclosed in Section 3.2.2.2, *Existing Air Quality*, the Project area is currently designated as a non-attainment area for the state 1-hour and 8-hour ozone standards, the state PM_{10} 24-hour standard, and the federal PM_{10} 24-hour standard. The southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is classified as non-attainment of the federal 8-hour ozone standard and the state $PM_{2.5}$ annual standard. See Figure 3.2-1 for an illustration of the portion of the Project site that is within the Western Mojave Desert Ozone

Non-attainment Area. These non-attainment designations are a result of poor air quality due to emissions associated with existing conditions in the MDAB, which include emissions associated with present federal actions. The Project area is designated as attainment for all other federal and state AAQSs, including the state and federal CO and SO_2 AAQSs. As indicated in Table 3.2-3, existing CO and SO_2 concentrations in the area are several orders of magnitude below the state and federal AAQSs, making the potential for future non-attainment designations in the MDAB related to these pollutants unlikely.

Several of the projects listed in Table 3.1-3 in Section 3.1 have been approved and cleared for construction. Those projects within the MDAB that would be constructed, operated, or decommissioned at the same time as the Proposed Action, an action alternative (i.e., Alternatives B, C, or D) or the CEQA No Project alternative (Alternative F) could contribute to existing adverse cumulative effects to air resources. Because Alternatives E and G would not result in a change to existing air resources, they would not contribute to existing adverse cumulative effects to air resources. The closest projects to the Proposed Action or alternatives are the XpressWest High Speed Passenger Rail Project and the Calnev Pipeline Expansion Project, both on the northwest side of I-15; however, these projects are over 1,000 feet from the existing residences in the vicinity of the Proposed Action and alternatives. Therefore, these projects combined with the Proposed Action, one of the action alternatives, or Alternative F would not cause an adverse cumulative air resource-related effect on sensitive receptors. There would be no air resources-related cumulative effect on sensitive receptors associated with Alternatives E and G because they would result in no changes to existing air resources.

As described in Section 3.2.5, short-term construction-related emissions of the Proposed Action or any of the action alternatives would exceed the federal *de minimis* levels and/or MDAQMD thresholds for NO_x, CO, and $PM_{10.}$ However, the MDAB is classified as attainment of CO AAQSs; therefore only the NO_x and PM_{10} emissions increases would result in an adverse cumulative effect relative to potential exceedances of AAQSs for ozone and PM_{10}. As described above, none of the cumulative projects listed in Table 3.1-3 is within 1,000 feet of the existing residences in the vicinity of the Proposed Action and alternatives. Therefore, these projects combined with the Proposed Action or one of the alternatives would not cause an adverse cumulative effect on sensitive receptors.

Long-term emissions associated with operation and maintenance of the Proposed Action, an action alternative, or the CEQA No Project alternative would not exceed the federal *de minimis* levels or thresholds adopted by the MDAQMD (see Section 3.2.5) with implementation of Mitigation Measure AIR-1; therefore, the emissions would not cause or contribute to an adverse cumulative effect relative to regional air resources. Because Alternatives E and G would not result in a change to existing air resources, they would not cause or contribute to a long-term adverse cumulative effect relative to regional air resources.

It is anticipated that decommissioning and restoration of the Proposed Action or an action alternative would result in the same cumulative impacts as those associated with construction of the action (see Section 3.2.6.4).

3.2.8 Mitigation Measures

Mitigation Measure 3.2-1: The Applicant shall apply water twice daily to all unpaved roads and unpaved parking areas actively used during operation and maintenance, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.

Mitigation Measure 3.2-2: During construction, vehicles and equipment shall not idle for more than 5 minutes if not moving or performing construction activities. The use of idling vehicle air conditioner units to reduce the effects of heat shall be prohibited unless required for a medical emergency.

3.2.9 Residual Effects

With the implementation of all Project design features, APMs, and mitigation measures, residual impacts to air resources will remain. Residual short-term construction impacts on air resources would result from construction of the Proposed Action or an action alternative, because each would cause emissions of NO_x, CO, and PM_{10} that could contribute to exceedances of AAQSs, even with implementation of Mitigation Measure 3.2-2. Residual long-term operation and maintenance impacts on air resources would not be adverse with implementation of Mitigation Measure 3.2-1. Operation and maintenance of the Proposed Action or an action alternative would result in emissions that would not be expected to contribute to an exceedance of an AAQS.

3.2.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G, Section III, a project would have a significant impact on air quality if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

3.2.10.1 Alternative A: Proposed Action

a) The Proposed Action would not conflict with or obstruct implementation of the applicable air quality plan. (No Impact)

The MDAQMD Triennial Revision to the 1991 Air Quality Attainment Plan, the 2004 Ozone Attainment Plan, and the 2008 MDAQMD Federal 8-Hour Ozone Attainment Plan include

recommended measures to control ROG and NO_x emissions generated from a variety of sources. The plans do not specifically address short-term construction emissions, and long-term operation of the Proposed Action would not include any major emission sources of ROG or NO_x (see Section 3.2.6.1, above). Therefore, operation would not conflict with or obstruct implementation of the MDAQMD ozone attainment plans. The Mojave Desert Planning Area Federal Particulate Matter Attainment Plan requires the preparation of a dust control plan for projects, such as the Proposed Action, that disturb more than 100 acres. Per Rule 403.2, the Applicant would be required to prepare and submit a site specific dust control plan for the Proposed Action prior to commencing earth-moving activities. Therefore, the Proposed Action would not conflict with or obstruct implementation of the Mojave Desert Planning Area Federal Particulate Matter Attainment Plan. In addition, the Applicant has proposed implementation of APMs 1 through 8, which are consistent with dust control strategies recommended in the Mojave Desert Planning Area Federal Particulate Matter Attainment Plan. There would be no impact. Because the Proposed Action would cause no impact related to criterion a, it would not cause or contribute to any cumulative effect related to conflicting with air quality plans.

b) Impact Air-1: Construction and decommissioning of the Proposed Action would generate short-term emissions of criteria air pollutants that could contribute to an existing or projected air quality violation. (Significant and Unavoidable)

The maximum daily emissions of NO_x, CO, and PM_{10} and the annual emissions of NO_x and PM_{10} that would be associated with construction of the Proposed Action would exceed the respective MDAQMD significance thresholds (see Tables 3.2-5 and 3.2-6). Therefore, it can be concluded that the Proposed Action could result in or contribute to short-term exceedances of ozone, CO, and PM_{10} AAQSs. The construction emissions identified in Tables 3.2-5 and 3.2-6 incorporate emission controls associated with APMs 1 through 10 (see Section 3.2.5), which represent state of the art emission controls. Mitigation Measure 3.2-2 would limit vehicle idling and therefore reduce criteria pollutant emissions, but not to less-than-significant levels. There are no additional feasible mitigation measures that could reduce the impact to less than significant; therefore, this impact would be significant and unavoidable. For the reasons discussed in Section 3.2.7, this impact would be cumulatively considerable for NO_x and PM10, but not for CO (see Impact Air-3).

Impact Air-2: Operation and maintenance of the Proposed Action would generate long-term emissions of criteria air pollutants that could contribute to an existing or projected air quality violation. (Less than Significant with Mitigation Incorporated)

Table 3.2-7 and Table 3.2-8 summarize estimated maximum daily and annual criteria pollutant emissions that would be generated each year during operation and maintenance. The annual and maximum daily emissions of all the criteria pollutants are below the MDAQMD thresholds of significance. However, the PM_{10} and $PM_{2.5}$ emissions presented in Tables 3.2-7 and 3.2-8 are based on a 55 percent reduction for fugitive dust to account for a fugitive dust control program that the Applicant has not formally committed to. Without implementation of long-term operation-based watering program to control fugitive dust, maximum daily emissions of PM_{10} would exceed the MDAQMD daily and annual thresholds potentially causing an exceedance of

state PM_{10} AAQSs. Therefore, to ensure that operation and maintenance does not result in an exceedance of state PM_{10} AAQSs and to formalize the Applicant's intent to water the site and unpaved access roads twice daily, Mitigation Measure 3.2-1 is recommended (see Section 3.2.8). The impact would be reduced to less than significant with implementation of Mitigation Measure 3.2-1. For the reasons discussed in Section 3.2.7, this impact would be cumulatively considerable for NO_x and PM10, but not for CO (see Impact Air-3).

c) Impact Air-3: The Proposed Action would generate emissions of criteria air pollutants which could contribute to existing non-attainment conditions and further degrade air quality. (Significant and Unavoidable)

As disclosed in Section 3.2.2.2, *Existing Air Quality*, the Project area is currently designated as a non-attainment area for the state 1-hour and 8-hour ozone standards, the state PM_{10} 24-hour standard, and the federal PM_{10} 24-hour standard. The southern portion of the Project site that is within the Western Mojave Desert Ozone Non-attainment Area is classified as non-attainment of the federal 8-hour ozone standard and the state $PM_{2.5}$ annual standard. The Project area is designated as attainment for all other federal and state AAQSs, including CO AAQSs.

Short-term construction-related and decommissioning-related emissions that would be associated with the Project would exceed the MDAQMD significance thresholds for NO_x and PM_{10} (see Section 3.2.5.1); therefore, the NO_x and PM_{10} emissions increases would be cumulatively considerable and would result in a significant cumulative impact relative to potential exceedances of AAQSs for ozone and PM_{10} (see Section 3.2.7). Project-related construction emissions of CO would also exceed the CO significance threshold; however, MDAB is currently attainment of all CO AAQSs. There is no additional feasible mitigation beyond APMs 1 through 10 and Mitigation Measure 3.2-2 that could reduce the impact to less than significant; therefore, the short-term cumulative impact would be significant and unavoidable.

Long-term operation and maintenance emissions of the Project would be reduced to a less-than-significant level with implementation of Mitigation Measure 3.2-1. For the reasons discussed in Section 3.2.7, the long-term emissions increases that would be associated with the Project would not be cumulatively considerable.

d) Impact Air-4: The Proposed Action would expose residences to toxic air contaminants. (Less than Significant)

Short-term emissions of DPM generated from construction of the Project would be limited to the 24- to 30-month construction period and would be dispersed throughout the proposed 4,179-acre ROW. In addition, on-site long-term emissions that would be associated with operation and maintenance of the Project would be negligible. Therefore, Project emissions would not be concentrated near the existing residences. Given the limited duration of exposure and the spatial distribution of emissions, it was determined that there would be little health risk to the nearby residences from exposure to Project-related DPM emissions (see Section 3.2.6.1). The impact would be less than significant.

With regard to cumulative impacts relative to exposing sensitive receptors to pollutant concentrations, all of the cumulative projects identified in Section 3.1 are over 1,000 feet from the existing residences in the vicinity of the Proposed Action. Therefore, these projects combined with the Proposed Action would not cause a significant cumulative impact on sensitive receptors near the Project site. For the reasons discussed in Section 3.2.7, the Proposed Action's contribution to this impact would not be cumulatively considerable.

e) Impact Air-5: The Proposed Action would generate odors from diesel equipment that could affect people in the area. (Less than Significant)

Project construction, operation, and maintenance would include diesel exhaust sources, such as off-road equipment and generators, that could result in the creation of objectionable odors; however, since the construction activities would be temporary and spatially dispersed throughout the requested ROW, and long-term operation of the diesel emergency generator would be periodic and substantially removed from the closest residences (i.e., a distance of over 1,300 feet), the Project-related odors would have a negligible effect on people in the area. The impact would be less than significant.

With regard to cumulative impacts relative to exposing people to objectionable odors, all of the cumulative projects identified in Section 3.1 are over 1,000 feet from the existing residences in the vicinity of the Proposed Action. Therefore, these projects combined with the Proposed Action would not cause a significant cumulative odor-related impact on people, and the Proposed Action's contribution to cumulative conditions would not be cumulatively considerable.

3.2.10.2 Alternative B

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative B. See Section 3.2.10.1 for the Proposed Action CEQA significance determinations; see also Sections 3.2.6.2 and 3.2.7.

3.2.10.3 Alternative C

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative C. See Section 3.2.10.1 for the Proposed Action CEQA significance determinations; see also, Sections 3.2.6.3 and 3.2.7.

3.2.10.4 Alternative D

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative D. See Section 3.2.10.1 for the Proposed Action CEQA significance determinations; see also, Sections 3.2.6.4 and 3.2.7.

3.2.10.5 Alternative E: No Action/No Project

Alternative E would not result in air quality impacts from Project construction, operation, maintenance, or decommissioning because it would result in no change from existing conditions.

Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect on air quality.

3.2.10.6 Alternative F: CEQA No Project

The impact statements and CEQA significance determinations identified for the Proposed Action or Alternative B, C, or D would be applicable to Alternative F, depending on the site layout alternative approved. See Section 3.2.10.1 for the Proposed Action CEQA significance determinations; see also Sections 3.2.6.6 and 3.2.7.

3.2.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would not result in air quality impacts from Project construction, operation and maintenance, or decommissioning because no ROW grant and no groundwater well permit would be authorized, resulting in no change from existing conditions. Because Alternative G would cause no impact to any of the CEQA criteria identified above, it would not cause or contribute to any cumulative effect on air quality.

References

California Air Resources Board (CARB), 2011. Updated Informative Digest – Proposed Amendments to the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen, and Other Criteria Pollutants from In-Use Heavy Duty Diesel-Fueled Vehicles. [http://www.arb.ca.gov/regact/2010/truckbus10/tbuid.pdf]

CARB, 2012. Ambient Air Quality Standards. [http://www.arb.ca.gov/research/aaqs/aaqs2.pdf]

CARB, 2013a. Area Designations Maps / State and National. [http://www.arb.ca.gov/desig/adm/adm.htm] Accessed August 6, 2013.

CARB, 2013b. iADAM Air Quality Data Statistics. [http://www.arb.ca.gov/adam/index.html] Accessed May 29, 2013.

Environmental Science Associates (ESA), 2013. Air Pollutant Emissions Estimates Supplement for the Soda Mountain Solar Project, July.

Mojave Desert Air Quality Management District (MDAQMD), 1977. MDAQMD Rules 402 and 402. [http://www.mdaqmd.ca.gov/index.aspx?page=142] Accessed August 7, 2013.

MDAQMD, 1996. MDAQMD Rule 403.2. [http://www.mdaqmd.ca.gov/Modules/ShowDocument.aspx?documentid=306] Accessed August 7, 2013.

MDAQMD, 2011. California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, August.

Pan Environmental, Inc., 2013. Final Air Quality and Greenhouse Gas Impact Analysis Soda Mountain Solar Project, May.

Panorama Environmental, Inc., 2013. Response to ESA Review of Air Quality and Greenhouse Gas Impact Analysis for Soda Mountain Solar Project, May.

San Bernardino County, 2007. San Bernardino County General Plan. Adopted March 13, 2007.

San Bernardino County, 2012. County of San Bernardino 2007 Development Code. Amended December 27, 2012.

Soda Mountain Solar, LLC, 2013. Applicant Proposed Measures, Soda Mountain Solar Project, BLM Case No. CACA 48584, July.

U.S. Environmental Protection Agency (USEPA), 2010 Federal Register, 40 CFR Parts 51 and 93, Revisions to the General Conformity Regulations; Final Rule / Vol. 75, No. 64 / Monday, April 5, 2010.

USEPA, 2012. List of 156 Mandatory Class I Federal Areas. [http://www.epa.gov/visibility/class1.html] Accessed June 3, 2013.

USEPA, 2013. Particulate Matter Regulatory Actions. [http://www.epa.gov/airquality/particlepollution/actions.html#dec12] Accessed May 23, 2013.

Western Regional Climate Center (WRCC), 2013. Period of Record Monthly Climate Summary for Baker, California (040436). [http://www.wrcc.dri.edu/cgi-bin/cliRECtM.pl?ca0436] Accessed May 29, 2013.

This page intentionally left blank

3.3 Biological Resources – Vegetation

3.3.1 Introduction

This section describes the environmental setting, vegetation communities, invasive plants, special-status plant species, and state and federal jurisdictional waters that are present within the proposed Project site. It also lists the special-status plant species that were observed or have potential to occur on the site. This discussion is based, in part, upon the following resources:

1. Panorama Environmental, Inc., 2013. Biological Resources Technical Report (BRTR) Soda Mountain Solar San Bernardino County, CA BLM Case Number CACA 49584, March 2013 (see Appendix E-1);

2. URS, 2009. Draft Jurisdictional Determination Report, Soda Mountain Solar Project, San Bernardino, California (November 3);

3. Caithness Soda Mountain, LLC, 2010a. Final 2009 Focused Special Status Plant Survey Report, Soda Mountain Solar Project, San Bernardino County, CA (October);

4. Caithness Soda Mountain, LLC, 2010b. Final 2009 Biological Resources Technical Report, Soda Mountain Solar Project, San Bernardino County, CA (October);

5. C.S. Ecological Surveys and Assessments, 2013a. Integrated Weed Management Plan Soda Mountain Solar San Bernardino County, CA, BLM Case Number CACA 49584. August 2013 (see Appendix E-2);

6. C.S. Ecological Surveys and Assessments, 2013b. Spring Rare Plant Survey Soda Mountain Solar Project BLM Case # CACA49584 San Bernardino County, California, May 2013;

7. The California Natural Diversity Database (CDFW, 2013); and

8. The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS, 2013).

This section uses the term “Project site” to describe the direct footprint of the Project, or total area of permanent and temporary disturbance. The term “study area” is used to describe areas of various size surrounding the Project site that were evaluated for impacts to biological resources. The geographic boundary of the study area differs depending on the resources studied. Table 3.3-1 identifies the study areas for vegetation and jurisdictional areas discussed in this section, which include BLM-administered lands and private lands under the land use jurisdiction of San Bernardino County. The study areas detailed in Table 3.3-1 included the entire footprint of the Project site (Panorama Environmental, Inc., 2013).

As identified in Appendix E-1, rare and special-status plant surveys were conducted in the spring of 2009 (April and May), fall of 2012 (October and November) (Panorama Environmental, Inc., 2013), and spring of 2013 (C.S. Ecological, 2013b). The 2009 botanical survey and 2012 fall rare plant survey were conducted in accordance with guidelines issued by the USFWS (1996),

TABLE 3.3-1
VEGETATION STUDY AREAS FOR THE SODA MOUNTAIN SOLAR PROJECT

Resources	Survey Dates	Survey Study Area
Special-status Plants, Succulents	Spring: April and May 2009	6,770 acres (2009 ROW)
Special-status Plants	Fall: October, November 2012	4,075 acres
	Spring: March and April 2013	4,490 acres
Jurisdictional Waters Delineation	May 2009	6,770 acres (2009 ROW)
	Spring 2012	4,559 acres

SOURCE: Panorama Environmental, Inc., 2013; C.S. Ecological, 2013b

California Department of Fish and Wildlife (CDFW) (CDFG, 2009), and CNPS (2001), with guidance from the Barstow BLM Field Office. Additionally, the 2012 and 2013 surveys followed guidelines provided by the BLM (2009) and direction from CDFW staff. Survey methods and botanist qualifications were reviewed by the BLM and CDFW staff prior to conducting the surveys (Panorama Environmental, Inc., 2013).

3.3.2 Regional and Local Environmental Setting

The Project site is located within the Soda Mountains Range in the central Mojave Desert (see Figure 1-2). It is located on gently sloping alluvial fans in the intermontane desert valley formed within a discontinuous, ring-shaped mountain range. Substrate on the site is dominated by uneven cobble, but also includes areas dominated by sand and finer materials with relatively little cobble, particularly in the east and south portions of the site. Desert pavement is present on portions of the Project site. The proposed 2,557-acre Project site would cover or otherwise disturb approximately 20 percent of the 12,000-acre valley. With the exception of I-15 and limited facilities at Rasor Road, the valley is mostly undeveloped.

Annual precipitation in the area averages between 4 to 5 inches per year. Elevations on the site range from approximately 1,200 to 1,500 feet above mean sea level with slopes between 2 and 5 percent. I-15 bisects the Project site and limits the natural movement of water, and botanical and wildlife resources in the regional area.

As characterized in the BRTR (Panorama Environmental, Inc., 2013), the Project site is not located within an Area of Critical Environmental Concern (ACEC), Wilderness, Wilderness Study Area, or a Desert Wildlife Management Area (DWMA). The Soda Mountain Wilderness Study Area is located in the Soda Mountains approximately 0.2 miles west of the Project site boundary. The northwest boundary of the Mojave National Preserve follows the ridgeline of the Soda Mountains 0.5 mile to 2.9 miles east of the Project site boundary. The Cronese Lakes ACEC and the Superior-Cronese DWMA are located approximately 5 miles west of the Project site (see Figure 3.15-1). The Baker Sink, a relic of one of the drainages that historically fed Pleistocene Lake Manley in Death Valley, is located northeast of the Project site and east of the south Soda Mountains.

3.3.2.1 Vegetation Communities

Three natural vegetation communities occur on the Project site. Most of the Project site shows sparse vegetation coverage with creosote bush-white bursage scrub, with creosote bush scrub and cheesebush scrub as other prominent communities (Figure 3.3-1). The scrub communities are traversed by a series of small washes and channels that have contributed to the uneven ground surface and prevalence of cobbles (rocks approximately 2.5 inches to 10 inches in diameter) throughout much of the site, particularly in the location proposed for construction of the North Array (Figure 3.3-2). Relatively small areas of "disturbed" and "developed" cover types occur in the eastern portion of the Project site. These correspond to built-out areas and existing unpaved roads, respectively. No dunes or sand fields occur on the Project site; however, such habitat is present approximately 0.4 mile south of the South Arrays. Table 3.3-2 summarizes the natural vegetation communities that occur on the Project site. No dry wash woodland habitat is present on the Project site.

Numerous desert washes of differing hydrologic capacity and size drain into the Soda Mountain Valley from the surrounding Soda Mountains. Much of the area proposed for the construction of the North Array drains to the north and east toward Soda Lake while the areas where the South Arrays and portions of the East Arrays would be located drain to the south toward the Mojave River Wash (Figure 3.3-2). Vegetation in these small washes, when present, is generally similar to the coyote bush-white bursage scrub that dominates the site; however, the larger wash on the east side of the Project site supports cheesebush scrub.

Upland

***Larrea tridentata –Ambrosia dumosa* Shrubland Alliance**

The *Larrea tridentata –Ambrosia dumosa* Shrubland Alliance vegetation community is common throughout the lower elevations of the Mojave Desert and covers about 97 percent of the study area. Creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are the main components of this community on the Project site, with few understory species. Devil's spineflower (*Chorizanthe rigida*) is the predominant herbaceous species in areas of desert pavement. The alluvial fans that support this vegetation type contain numerous intermittent braided channels, washes, and gullies that occasionally support species typical of desert washes (see Appendix E-1, Table 3.2-1) (Panorama Environmental, Inc., 2013). These wash species are intermixed with other species in areas where creosote and white bursage are dominant.

Ambrosia salsola Shrubland Alliance

The *Ambrosia salsola* Shrubland Alliance vegetation community is typically found in washes, intermittent channels, and arroyos in the Mojave Desert. A large wash that runs southwest to northeast through the area proposed for construction of the South and East arrays is mapped in the BRTR as this community type (Figure 3.3-1) (Panorama Environmental, Inc., 2013). The wash is the only location of this community on the Project site.

TABLE 3.3-2
NATURAL COMMUNITIES AND COVER TYPES ON THE PROJECT SITE

Vegetation Alliance[a]	Dominant Species	Vegetation Types on the Project Site (Acres)			
		Proposed Action	Alternative B	Alternative C	Alternative D
Areas within Permanent Project Footprint					
Larrea tridentata –Ambrosia dumosa Shrubland[c]	Creosote bush White bursage	2,178.59	1,601.98	1,803.73	1,674.66
Larrea tridentata Shrubland[b]	Creosote bush	19.1	19.1	0	19.1
Ambrosia salsola Shrubland	Cheesebush	3.26	3.26	0.39	2.88
Developed	Unvegetated	5.78	6.30	3.60	4.65
Disturbed	N/A	0	0	0	0
	Subtotal Acres	**2,206.73**	**1,630.64**	**1,807.72**	**1,701.29**
Areas within Temporary Project Footprint					
Larrea tridentata –Ambrosia dumosa Shrubland[c]	Creosote bush White bursage	246.93	185.44	217.87	169.80
Larrea tridentata Shrubland[b]	Creosote bush	5.38	5.38	0	5.38
Ambrosia salsola Shrubland	Cheesebush	2.31	2.31	1.63	.68
Developed	Unvegetated	2.49	5.03	1.9	1.1
Disturbed	N/A	0	0	0	0
	Subtotal Acres	**257.11**	**198.16**	**221.4**	**176.96**
	Grand Total	**2,463.84**	**1,828.8**	**2,029.12**	**1,906.96**

NOTES:

[a] Vegetation alliances are based on *A Manual of California Vegetation, Second Edition* (Sawyer, et al., 2009)

[b] GIS data for temporary disturbance areas was partially available for alternatives. The Proposed Action temporary footprint area for disturbances related to Proposed Action facilities including access roads, brine ponds, berms, collector routes, laydown areas, and temporary fencing; was used for the three alternatives was also used for alternatives.

[c] Impact numbers presented here differ slightly from those in Chapter 2, *Project Description*, due to the absence of GIS data for some proposed facilities. For permanent impacts, the location of the 15-acre substation would presumably be located within *Larrea tridentata – Ambrosia dumosa* Shrubland; however, the precise location and therefore the associated habitat alliance are not known. The area of this permanent feature is not included above for the Proposed Action or alternatives. The temporary Project footprint differs from that presented in Chapter 2 in that Alternative A is about 68 acres smaller in Table 3.3-2. This 68-acre temporary disturbance area includes 25 acres for the substation, 30 acres for laydown areas in unspecified locations, and about 13 acres for which vegetation data is not available for the collector line and access road north of I-15.

SOURCE: Sawyer et al., 2009; Panorama Environmental, Inc., 2013

Larrea tridentata Shrubland Alliance

The *Larrea tridentata* Shrubland Alliance vegetation community is similar to creosote bush-white bursage scrub, but white bursage is absent, or present at less than 1 percent cover (Sawyer et al., 2009). One moderately sized area within the location of the East Arrays was mapped as this community type (Figure 3.3-1). Shrub diversity in this area was very low, consisting primarily of widely spaced creosote bush and occasional white bursage at very low percent cover (Panorama Environmental, Inc., 2013).

Other Cover Types

Developed and Disturbed Land

The existing unpaved roads on the Project site, which are subject to ongoing use and maintenance, are characterized as developed land. The abandoned mine near the proposed operation and maintenance facility near the location South Arrays represents disturbed habitat (Panorama Environmental Inc., 2013).

3.3.2.2 Invasive Plants

Invasive plants are species of non-native plants included on the weed lists of the California Department of Food and Agriculture (CDFA) (2010), the California Invasive Plant Council (Cal-IPC), or those weeds of special concern identified by the BLM. Invasive plants are defined as "non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health," based on the definition provided in Executive Order 12112 (see Section 3.3.3.1 for details). They are of particular concern in wildlands because of their potential to degrade habitat and disrupt the ecological functions of an area (Cal-IPC, 2006). Invasive plants can create a host of environmental and other effects, most of which are harmful to native ecosystem processes. Specifically, invasive plants can alter habitat structure and functionality, increase fire frequency and intensity, increase the potential for erosion and reduced water quality, decrease forage (including for special-status species, such as desert tortoise), exclude native plants, and decrease water availability for both plants and wildlife. Soil disturbance and gathering and channeling water create conditions favorable to the introduction of invasive plants or the spread of existing populations. The movement of construction equipment and the introduction of off-site fill and mulch can act as vectors introducing invasive plants into an area.

Invasive plant species were recorded during surveys conducted in support of the proposed Project (Panorama Environmental, Inc., 2013; C.S. Ecological Surveys and Assessments, 2013a). Other species of concern are also present but not widespread within and adjacent to the Project site. Table 3.3-3 identifies those invasive plants that were observed during botanical surveys.

Among those invasive plants within the study area, Sahara mustard (*Brassica tournefortii*) showed the greatest distribution. It occurs in low-to-medium densities throughout the Project site, with "high" levels of infestation described in the southern portion of the location of the South Arrays (C.S. Ecological Surveys and Assessments, 2013a). This species is of high concern; it is a BLM weed of special concern and Cal-IPC has declared this plant highly invasive (Cal-IPC, 2006) and recommends that it should be eradicated whenever encountered. This species is associated with impacts to habitat for native wildlife as well as for native plants. It promotes the spread of fire by increasing fuel load and competes with native plants for moisture and nutrients. In addition, it increases cover and works to stabilize sand, thereby affecting wildlife species dependent on open sandy habitat (Brossard et al., 2000; Barrows and Allen, 2007).

TABLE 3.3-3
INVASIVE WEED SPECIES IN THE PROJECT SITE

Species	Weed List and Rating	Occurrence within the Project Site
Sahara mustard *Brassica tournefortii*	Cal-IPC: High, Concern to Barstow BLM	Observed throughout Project site and approaches infestation level on loose, sandy soils; uncommon on desert pavement soils
Red brome *Bromus madritensis* ssp. *rubens*	Cal-IPC: High, BLM List	Observed on disturbed soils in southern portion of Project site and can become dense in wet periods
Cheatgrass *Bromus tectorum*	Cal-IPC: High, BLM List	Observed on disturbed soils in southern portion of Project site
Redstem filaree *Erodium cicutarium*	Cal-IPC: Limited	Observed throughout the Project site at low densities; uncommon on desert pavement soils
Mediterranean barley *Hordeum murinum*	Cal-IPC: Moderate	Observed in the southwest corner of the South Arrays on disturbed soils
Crystalline iceplant *Mesembryanthemum crystallinum*	Cal-IPC: Moderate	Observed in southwest portion of the Project site
Mediterranean grass *Schismus barbatus*	Cal-IPC: Limited, Concern to Barstow BLM	Observed throughout the Project site; uncommon on desert pavement soils
Five-stamen tamarisk *Tamarix chinensis*	CDFA: BLM List	Observed at one location on the Project site; several occurrences within adjacent lands
Rattail fescue *Vulpia myuros*	Cal-IPC: Moderate,	Observed

Cal-IPC Overall Ratings

High These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Cal-IPC Ecological Impact, Invasive Potential, and Distribution Codes

BLM List: BLM National List of Invasive Weed Species of Concern

SOURCE: C.S. Ecological Surveys and Assessments, 2013a

3.3.2.3 Special-Status Plant Species

Special-status plants are those species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. For the purposes of this PA/EIS/EIR, special-status species are defined as meeting one or more of the following criteria:

1. Formally listed as threatened, endangered or candidate species for future listing as threatened or endangered under the federal and California endangered species acts (FESA and CESA, respectively);

2. Identified as species of concern by CDFW;

3. A plant species considered by the CNPS to be "rare, threatened, or endangered in California" (CNPS List 1A, 1B, and 2) as well as CNPS List 3 and 4[1] plant species;
4. A plant listed as rare under the California Native Plant Protection Act[2];
5. Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances; or
6. All BLM Sensitive species.[3]

As characterized in Table 3.3-1, extensive botanical surveys have been performed within the study area, including surveys for rare plants. Table 3.3-4 identifies those special-status plant species evaluated during the analysis that are known or could potentially occur in the vicinity of the Project site. Based on the findings of 2009 and 2012 floristic surveys of the study area, two special-status plants occur on the Project site: Emory's crucifixion-thorn (*Castela emoryi*) and Utah milkvine (*Funastrum utahense*) (Panorama Environmental, Inc., 2013; C.S. Ecological Surveys and Assessments, 2013b). The findings of the spring 2013 botanical surveys of the study area are incorporated into the discussion below. The location of identified special-status plants in the study area is presented in Figure 3.3-3.

In total, 129 species of vascular plants were identified in the study area (Panorama Environmental, Inc., 2013; C.S. Ecological Surveys and Assessments, 2013b). Of these, 121 are native, 9 are naturalized, and 8 are considered noxious or invasive weeds in California. No federal or state-listed plant taxa were observed. Additionally, small-flowered androstephium (*Androstephium breviflorum*) could not be definitively ruled out for occurrence within the study area. Although the presence of this species is judged to be unlikely, no plants could be found at several reference populations visited prior to the surveys, and there may have been insufficient winter and spring rainfall for the growth of this species in 2013. The habitat requirements and distribution of Emory's crucifixion-thorn and Utah vine milkweed are detailed below.

Emory's crucifixion-thorn

Status: Emory's crucifixion-thorn has no state or federal listing status but is rated as California Rare Plant Rank (CRPR) 2.3[4] species which indicates that it is rare, threatened, or endangered in

1 List 3 and 4 plants are included in the CNDDB *Special Plants, Bryophytes, and Lichens List.* [Refer to the current online published list available at: http://www.dfg.ca.gov/biogeodata.].

2 As defined by the California Native Plant Protection Act, a plant is rare when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901).

3 BLM designates "sensitive" species as those requiring special management considerations to promote their conservation and reduce the likelihood and need for future listing under FESA. BLM Sensitive species include all federal Candidate and federally delisted species that were so designated within the last 5 years, and CNPS List 1B species that occur on BLM lands.

4 In July 2013, the California Native Plant Society Rare Plant Program and Rare Plant Program Committee developed the new California Rare Plant Ranks (CRPR) 2A and CRPR 2B. CRPR 2B contains all of the plants formerly included on CRPR 2, and are defined as plants that are rare in California, but are more common outside of the state's boundaries. CRPR 2A includes a small number of plants formerly included on CRPR 1A, which are presumed extirpated in California, but more common elsewhere.

California, but more common elsewhere and is not very endangered in California. The CNPS Rare and Endangered Plant Inventory states that Emory's crucifixion-thorn is threatened by solar energy development and possibly threatened by road maintenance and herbicide use (CNPS, 2013).

Distribution: Emory's crucifixion-thorn occurs in California and Arizona and in the Mexican states of Baja California and Sonora. Within California, it is known to occur in Imperial, extreme southern Inyo (one record only), Riverside, and San Bernardino counties. The nearest known other population is approximately 20 miles southwest of the Project site, north and south of I-15.

Habitat and Biology: This perennial shrub or small tree is known to occur in dry gravelly washes in the Mojave and Sonoran deserts and on playas at elevations between 295 and 2,198 feet (CNPS, 2013).

Status in Project Site: Two clumps of multi-stemmed Emory's crucifixion-thorn shrubs were discovered in the Project study area, approximately 0.25-mile south of the North Array (Figure 3.3-3). The plants were growing at the margin of a desert wash in the middle of a large alluvial fan dominated by *Larrea tridentata –Ambrosia dumosa* shrubland. One clump had an estimated three stems and two stems were observed in the second clump for a total of approximately five stems.

Utah vine milkweed

Status: Utah vine milkweed is not state or federally listed, but it is designated CRPR rank 4.2, indicating that it has limited distribution in California (CDFW, 2013). As a rank 4.2 species, Utah vine milkweed does not receive specific protection under CEQA or NEPA.

Distribution: Utah vine milkweed has been reported in Imperial, Riverside, San Bernardino, and San Diego counties in California. The Utah vine milkweed is also known to occur in Arizona, Nevada, and Utah (CNPS, 2013). More than 60 occurrences have been reported in San Bernardino County. The nearest other reported occurrence of Utah vine milkweed is about 30 miles southwest of the Project site north of I-40 in the Cady Mountains.

Habitat and Biology: This herbaceous vine occurs in sandy or gravelly soils, on sites with regular overland surface flow in the Mojave and Sonoran deserts of California at elevations ranging from 325 to 4,700 feet.

Status in Project Site: Utah vine milkweed plants were recorded at 25 locations during spring 2009 surveys and at 13 locations during fall 2012 surveys (Figure 3.3-3). All locations were within deeply incised channels in a hydrologically active portion of the alluvial fan in the North Array.

Cacti and Native Trees

Several species of non-listed cactus and native desert trees were identified but not enumerated within the study area including beavertail cactus (*Opuntia basilaris* ssp. *basilaris*), California barrel cactus (*Ferocactus cylindraceus*), cotton top (*Echinocactus polycephalus*), fish hook cactus (*Mammillaria tetrancistra*), golden cholla (*Cylindropuntia echinocarpa*), buckhorn cholla

TABLE 3.3-4
SPECIAL-STATUS SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name Scientific Name	Status Fed/State/BLM/ CRPR[c]	General Habitat	Potential for Species Occurrence on the Project Site			
			Proposed Action	Alternative B	Alternative C	Alternative D
Desert wing fruit *Acleisanthes nevadensis*	--/--/--/2.1	Rocky, gravelly soil with various geological origins in Joshua tree woodland and Mojavean desert scrub at elevations between 2,610 and 4,100 feet amsl.	**Absent:** Not observed during surveys. Known locations are at higher elevations. The nearest known occurrence is approximately 35 miles to the northeast in Shadow Valley.	**Absent**	**Absent**	**Absent**
Small-flowered androstephium *Androstephium breviflorum*	-/-/-/2.2	Habitat consists of open sandy flats and bajadas, typically stabilized blowsands, at elevations between 890 and 2,100 feet amsl in California, and in locations that are cold in the winter and have relatively high summer rainfall levels.	**Low:** Not observed surveys; however, surveys were outside of the flowering season. Marginally suitable habitat is present on-site. The nearest occurrence is approximately 10 miles west.	**Low:** Suitable habitat present and likelihood on-site is considered low.	**Low:** Suitable habitat present and likelihood on-site is considered low.	**Low:** Suitable habitat present and likelihood on-site is considered low.
Mojave milkweed *Asclepias nyctaginifolia*	--/--/--/2.1	Mojavean desert scrub and pinyon and juniper woodland, often in washes at elevations between 2,870 and 5,580 feet amsl.	**Absent:** Not observed during surveys. Nearest known occurrence is 35 miles to the northeast.	**Absent**	**Absent**	**Absent**
Three-awned grama *Bouteloua trifida*	--/--/--/2.3	Mojavean desert scrub on rocky carbonate substrates at elevations between 2,300 and 6,560 feet amsl.	**Absent:** Suitable habitat is not present and the species was not observed during appropriately timed surveys. The nearest record is approximately 40 miles to the southeast on limestone substrates in the Providence Mountains.	**Absent**	**Absent**	**Absent**
Alkali mariposa lily *Calochortus striatus*	--/--/--/1B	Perennial bulbiferous herb occurring in chaparral, chenopod, and Mojavean desert scrub, ephemeral washes, and meadows and seeps (alkaline, mesic). From 230 to 5,230 feet amsl in elevation.	**Absent:** Suitable habitat is present; however, this species was not observed during appropriately timed surveys. The nearest location is approximately 35 miles west.	**Absent**	**Absent**	**Absent**
Emory's crucifixion-thorn *Castela emoryi*	--/--/--/2.3	Gravelly soil in Mojavean desert scrub, on playas, and in Sonoran desert scrub at elevations between 300 and 2,200 feet amsl.	**Present:** Observed in 2009 and 2012 south of the location of the North Array. Identified plants are within the study area but outside of the Project site.	**Absent**	**Present:** Observed in 2009 and 2012 south of the North Array. Identified plants are within the study area but outside of the Project site.	**Present:** Observed in 2009 and 2012 south of the North Array. Identified plants are within the study area but outside of the Project site.

TABLE 3.3-4 (Continued)
SPECIAL-STATUS SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name Scientific Name	Status Fed/State/BLM/ CRPR[c]	General Habitat	Potential for Species Occurrence on the Project Site			
			Proposed Action	Alternative B	Alternative C	Alternative D
Abrams' spurge *Chamaesyce abramsiana*	--/--/--/2.2	Mojavean desert scrub, Sonoran desert scrub on sandy or silty substrates at elevations between 0 and 3,000 feet amsl.	**Absent:** Suitable habitat is present, but this species was not observed during appropriately timed surveys. The nearest known occurrence is approximately 40 miles to the southeast in the Providence Mountains.	**Absent**	**Absent**	**Absent**
Parry's spurge *Chamaesyce parryi*	--/--/--/2.3	Desert dunes and Mojavean desert scrub on sandy soils at elevations between 1,300 and 2,400 feet amsl.	**Absent:** Suitable habitat is present, but this species was not observed during surveys conducted during the flowering period. The nearest known occurrence is approximately 30 miles to the southeast in the Kelso Dunes.	**Absent**	**Absent**	**Absent**
Revolute spurge *Chamaesyce revoluta*	--/--/--/4.1	Rocky soils in Mojavean desert scrub at elevations between 3,590 and 10,170 feet amsl.	**Absent:** Suitable habitat is not present and the species was not observed during surveys. The nearest known location of this species is approximately 40 miles to the southeast in the Providence Mountains at over 3,280 feet amsl on rocky carbonate soil.	**Absent**	**Absent**	**Absent**
White-bracted spineflower *Chorizanthe xanti* var. *leucotheca*	--/--/--/1B	Annual herb. Occurs in Mojavean desert scrub and pinyon and juniper woodland. From 985 to 3,950 feet amsl in elevation.	**Absent:** Suitable habitat is present; however, this species was not observed during appropriately timed surveys. There are no observances of this species within 50 miles.	**Absent**	**Absent**	**Absent**
Desert pincushion *Coryphantha chlorantha*	--/--/--/2.1	Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland on gravelly, rocky carbonate substrates at elevations between 150 and 5,590 feet amsl.	**Absent:** Suitable habitat for this species is not present. This cactus can be detected year-round. The closest recorded occurrence of this species is approximately 15 miles to the northeast on carbonate substrates in the Shadow Mountains.	**Absent**	**Absent**	**Absent**
Nine-awned pappus grass *Enneapogon desvauxii*	--/--/--/2.2	Rocky carbonate soils in pinyon and juniper woodland at elevations between 4,180 and 5,990 feet amsl.	**Absent:** Suitable habitat is not present and the species was not observed during surveys. The nearest known occurrence is approximately 40 miles to the northeast on rocky carbonate substrate in the Clark Mountains.	**Absent**	**Absent**	**Absent**

TABLE 3.3-4 (Continued)
SPECIAL-STATUS SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name Scientific Name	Status Fed/State/BLM/ CRPR[c]	General Habitat	Potential for Species Occurrence on the Project Site			
			Proposed Action	Alternative B	Alternative C	Alternative D
Harwood's eriastrum *Eriastrum harwoodii*	--/--/--/1B	Grows in semi-stabilized sand dunes in the deserts of San Bernardino County.	**Absent:** Suitable habitat is not present and the species was not observed during surveys conducted during the flowering period. The nearest occurrence is approximately 5 miles south in the Mojave River Wash.	**Absent**	**Absent**	**Absent**
Utah vine milkweed *Funastrum utahense*	--/--/--/4.2	Perennial herb. Occurs in Mojave desert scrub and Sonoran desert scrub on sandy or gravelly soils. From 490 to 4,710 feet amsl in elevation.	**Present:** Observed in 25 locations in 2009 and 13 locations in 2012 within the study area; south of the North Array. The Project would mostly avoid the population.	**Low:** Surveys did not identify this species east of Interstate 15.	**Present:** Observed in 25 locations in 2009 and 13 locations in 2012 within the study area; south of the North Array. The Project would mostly avoid the population.	**Present:** Observed in 25 locations in 2009 and 13 locations in 2012 within the study area; south of the North Array. The Project would mostly avoid the population.
Parish club-cholla *Grusonia parishii*	--/--/--/2.3	Perennial stem succulent. Occurs in Mojave desert scrub, Sonoran desert scrub, and Joshua tree woodland. From 985 to 5,000 feet amsl in elevation. Occasionally known to bloom as late as July.	**Absent:** Suitable habitat is present; however, this species was not observed during surveys. The nearest occurrence is approximately 45 miles east	**Absent**	**Absent**	**Absent**
Cave evening-primrose *Oenothera cavernae*	--/--/--/2.1	Great Basin scrub, Joshua tree woodland, and Mojavean desert scrub on gravelly calcareous substrates or limestone outcrops at elevations between 2,490 and 4,200 feet amsl.	**Absent:** Suitable habitat is not present and the species was not observed during surveys. The nearest known occurrence is approximately 50 miles to the northeast in the Clark Mountains (CDFW 2012b).	**Absent**	**Absent**	**Absent**
Long stem evening-primrose *Oenothera longissima*	--/--/--/2.2	Mojavean desert scrub and pinyon and juniper woodland at seasonally mesic sites at elevations between 3,280 and 5,580 feet amsl.	**Absent:** Suitable mesic habitat is absent and this species was not observed during surveys. The closest known occurrence of this species is approximately 35 miles to the southeast in the Providence Mountains.	**Absent**	**Absent**	**Absent**
Short-joint beavertail cactus *Opuntia basilaris* var. *brachyclada*	--/--/--/1B.2	Stem succulent shrub. Occurs in chaparral, Joshua tree "woodland," Mojavean desert scrub, alluvial scrub, and in pinyon and juniper woodland, often on sandy soils or coarse, granitic loam. Occurs from 1,395 to 5,910 feet amsl in elevation.	**Absent:** Suitable habitat is present; however, this species was not observed during surveys. There are no observances of this species within 50 miles.	**Absent**	**Absent**	**Absent**

TABLE 3.3-4 (Continued)
SPECIAL-STATUS SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name Scientific Name	Status Fed/State/BLM/ CRPR[c]	General Habitat	Potential for Species Occurrence on the Project Site			
			Proposed Action	Alternative B	Alternative C	Alternative D
Latimer's woodland gilia *Saltugilia latimer*		Annual herb. Occurs in chaparral, Mojavean desert scrub, and Pinyon and juniper woodland, usually on granitic rocky or sandy soils, sometimes near washes. From 1,310 to 6,235 feet amsl in elevation.	**Absent:** Suitable habitat is present; however, this species was not observed during surveys. The nearest observance is approximately 50 miles west near the Granite Mountains.	**Absent**	**Absent**	**Absent**
Jackass-clover *Wislizenia refracta* ssp. *refracta*	--/--/--/2.2	Desert dunes, Mojavean desert scrub, playas, and Sonoran desert scrub at elevations between 1,970 and 2,620 feet amsl.	**Absent:** Suitable habitat is present, but this species was not observed during surveys. The closest known occurrence of this species is approximately 35 miles to the southwest near Coyote Lake.	**Absent**	**Absent**	**Absent**

Status Codes:

Federal

FE = Federally listed, endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future

State

SE = State listed as endangered
ST = State listed as threatened
R = State characterized as rare

California Rare Plant Rank designations:

1B Rare, threatened, or endangered in California and elsewhere.
2 Rare, threatened, or endangered in California, but more common elsewhere.
3 More information is needed – a review list.
4 Limited distribution – a watch list.

California Rare Plant Rank threat categories:

.1 Seriously endangered in California.
.2 Fairly endangered in California.
.3 Not very endangered in California.

Bureau of Land Management

BLM Sensitive = Species that require special management consideration to avoid potential future listing under the FESA and that have been identified in accordance with procedures set forth in BLM Manual section 6840 (BLM, 2008).

SOURCES: CDFW, 2013; Panorama Environmental, Inc., 2013; C.S. Ecological Surveys and Assessments, 2013b

(*C. acanthicarpa* var. *coloradensis*), and pencil cholla (*C. ramosissima*). In addition, 12 blue palo verde (*Parkinsonia florida*) were identified in the study area, of which 6 occur on the Project site, and one western honey mesquite (*Prosopis glandulosa* var. *torreyana*) was identified on the Project site (C.S. Ecological Surveys, 2013b).

3.3.2.4 Jurisdictional Waters

Ephemeral Dry Washes

Ephemeral dry washes are defined by shelving and/or scour resulting in an established bed, bank, and channel. Such features on the Project site are not regulated by the U.S. Army Corps of Engineers as waters of the U.S. due to their isolated nature (Panorama Environmental, Inc., 2013; USACE, 2013). They are, however, subject to CDFW jurisdiction as waters of the State under California Fish and Game Code Section 1600 (et seq.). The 2009 delineation of waters of the State was updated in 2012 to respond to updated guidance and consultation with CDFW. Waters of the State were delineated consistent with the methods defined in *A Review of Stream Processes and Forms in Dryland Watersheds* resulting in the identification of 1,240 acres of waters of the State in the study area (Vyverberg, 2010; Panorama Environmental, Inc., 2013). Up to 498.68 acres of CDFW jurisdictional area occurs within the Project site and would be subject to direct disturbance (Table 3.3-5).

TABLE 3.3-5
WATERS OF THE STATE ON THE PROJECT SITE

Project Component	Area within Project Site (Acres)			
	Proposed Action	Alternative B	Alternative C	Alternative D
Total	498.68	348.89	462.72	446.44

SOURCE: Panorama Environmental, Inc., 2013

Hydrologic Function. The washes and ancillary drainage features are the primary fluvial systems within the study area, and these provide a significant potential for aquifer recharge during storm events. Vegetated swales are the secondary fluvial system and do not present a significant potential for aquifer recharge. However, the vegetated swales present high functions and values for surface water quality (USACE, 1979). The ephemeral washes are not sufficiently developed to abate flooding in severe storms. However, the unvegetated portions of the ephemeral washes and swale features and networks can intercept runoff and reduce the velocity of surface water and potentially remove or transform pollutants through physical, chemical, and biological processes improving water quality.

Plant Habitat Function. The ephemeral washes and vegetated swale networks provide habitat for establishment of more developed plant diversity and developed spatial structure because of access to water relative to upland areas. The diversity of plants also provides habitat to special-status species, discussed below. Typical habitat for the desert tortoise in the Mojave Desert has

been characterized as creosote bush scrub where a diversity of perennial plants is relatively high and production of ephemeral forage plants is also high (USFWS, 2011). Desert dry wash woodland and vegetated swales offer high functions and values such as forage production and shelter, while unvegetated ephemeral dry washes comparatively offer moderate to low functions and values relative to forage production and shelter.

Animal Habitat Function. Ephemeral dry washes are integral to the ecological function of the watershed. The ephemeral washes, both vegetated and unvegetated, and vegetated swale networks provide unique wildlife habitat with a diversity of vegetation and topography. Ephemeral washes provide cover, foraging habitat, opportunities for wildlife burrowing and cover, and corridors for wildlife movement.

3.3.3 Applicable Laws, Regulations, Plans, and Standards

3.3.3.1 Federal

National Environmental Policy Act

NEPA (42 USC §4321 et seq.) declares a continuing federal policy that directs "a systematic, interdisciplinary approach" to planning and decision-making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the CEQ (40 CFR Parts 1500-1508) requires federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of federal actions. The BLM is the Lead Agency under NEPA for the Project.

Executive Order 13112 – Invasive Species

Executive Order 13112 was signed in February 1999 and established the National Invasive Species Council. This Order requires agencies to identify actions that may affect the status of invasive species. It also directs federal agencies not to authorize, fund, or carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that the agency has prescribed, it has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Plant Protection Act of 2000

The Plant Protection Act of 2000 (7 USC Ch. 104) established a federal program to control the spread of noxious weeds. The Secretary of Agriculture is authorized to publish a list of plants

designated as noxious weeds (7 USC §7712(f)). The movement of all such weeds in interstate or foreign commerce is prohibited except under permit.

Lacey Act, as amended

The Lacey Act (16 USC §§3371-3378) protects plants and wildlife by creating civil and criminal penalties for a wide variety of violations including illegal take, possession, transport or sale of protected species.

Federal Endangered Species Act

The FESA (16 USC §1531 et seq.) designates threatened and endangered species, both animal and plant species, and provides measures for their protection and recovery. "Take" of listed wildlife, and of listed plant species located on federal land, is prohibited without obtaining a federal permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage the habitat of (i.e., harm) listed wildlife species require approval from the USFWS or the National Marine Fisheries Service. The FESA also generally requires determination of critical habitat for listed species. If critical habitat has been designated, impacts to areas that contain the primary constituent elements identified for the species, whether or not it is currently present, is also prohibited. FESA Section 7 and Section 10 provide two pathways for obtaining authority to take listed species.

For projects proposed on federal lands, federal agencies such as the BLM are required by the FESA to ensure that any action they authorize, implement, or fund, including energy developments, will not jeopardize the continued existence of any federally threatened or endangered species or destroy or adversely modify designated critical habitat. Under FESA Section 7 consultation, the lead agency (e.g., BLM) prepares a Biological Assessment (BA) that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat, and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, the USFWS then responds to the BA by issuing its Biological Opinion (BO) determining whether the project is likely to jeopardize the species or result in adverse modification of critical habitat.

If a "non-jeopardy" or "no adverse modification" opinion is provided by the USFWS, the federal agency may proceed with the action as proposed. If a jeopardy or adverse modification opinion is provided, the USFWS may prepare a BO with reasonable and prudent measures to minimize take and associated mandatory terms and conditions that describe the methods for accomplishing these prudent measures and/or also develop mandatory reasonable and prudent alternatives to the proposed action.

Clean Water Act

The federal CWA (33 USC 1251 et seq.) is intended to restore and maintain the quality and biological integrity of the nation's waters. It prohibits the discharge of pollutants into waters of

the United States without a National Pollutant Discharge Elimination System (NPDES) permit from the USEPA. By issuing NPDES permits, the USEPA can regulate the discharge of pollutants to protect water quality.

Section 404 of the CWA provides that whenever any person discharges dredged or fill material into waters of the U.S. (e.g., streams, wetlands, lakes, bays) a permit is required from the United States Army Corps of Engineers (USACE). The USACE has issued 50 separate Nationwide Permits (NWPs) for different types of projects with impacts to wetlands (as of March 19, 2007). Depending on the level of impact, projects qualifying for an NWP may be required to provide the USACE with Pre-Construction Notification of the impacts and meet other restrictions. Projects with greater wetland impacts than those allowed under one of the NWPs require an Individual Permit. The process of obtaining an individual permit includes public notice and response to all comments received; the permit decision document includes a discussion of the environmental impacts of the project, the permit addresses public and private needs, alternatives to achieve project purposes if needed, and beneficial and/or detrimental effects of the project on public and private uses. In SWANCC vs. USACE, the Supreme Court ruled that the jurisdiction of the USACE does not extend to isolated, intrastate, non-navigable waters and wetlands, such as vernal pools, ephemeral streams, and wetlands not associated with a stream channel. The USACE also authorizes activities that involve structures or work in or affecting navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899. Waters of the U.S. and navigable waters do not occur on the Project site (USACE, 2013).

Section 401 of the CWA requires that an applicant for a federal license or permit to discharge into navigable waters must provide the federal agency with a water quality certification, declaring that the discharge would comply with water quality standards requirements of the CWA. USACE issuance of a Section 404 permit triggers the requirement that a Section 401 certification also be obtained. In California, the RWQCBs issue this certification.

BLM Sensitive Species

BLM Sensitive Species are species designated by the State Director. This list includes species that may be federally listed, proposed, or candidate species, or state-listed. BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered."(BLM, 2013) Various offices of the BLM maintain a list of special-status plant and wildlife species that are to be considered as part of the management activities carried out by the BLM on the lands that they administer.

CDCA Plan

The CDCA Plan (BLM, 1999) covers approximately 25 million acres of land in southern and southeastern California, with approximately 10 million acres being administered by the BLM. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development and protection of the resources and public lands within the CDCA and is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality.

The CDCA Plan Multiple Use Class Guidelines (BLM, 1999, Table 1) specify the limitations on vegetation harvesting and manipulation that apply to Multiple Use Classes L (limited), M (moderate), and I (intensive), each of which is present on the Project site (see Figure 1-2). See Section 3.9 for more information about these limitations and an analysis of the Project's consistency with these guidelines.

WEMO Plan

The West Mojave Plan (WEMO or Plan) includes a 9,359,070-acre planning area in an area located to the north of the Los Angeles metropolitan area. As an amendment to the CDCA Plan that was implemented in 1980, the WEMO Plan is the largest habitat conservation plan (HCP) and federal land use plan amendment ever put in place in the United States. The Plan was implemented by the BLM, San Bernardino County, and the City of Barstow and applies to both public and private lands that include 3,263,874 acres of BLM-administered public lands, 3,029,230 acres of private lands and 102,168 acres of lands administered by the State of California. The Project is located on the eastern fringe of the WEMO planning area, thus, consistency with the Plan is required.

The WEMO provides a comprehensive strategy to conserve and protect the desert tortoise, Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part. The Plan additionally offers a streamlined process for public agencies and private entities to meet their federal and state endangered species act requirements.

Key focal areas of the WEMO Plan include protecting large blocks of high quality habitat, avoiding human impacts on conservation areas, accommodating particularly vulnerable species, and preserving biodiversity. As a major component of the Plan, large areas of relatively low conservation value lands have become available for development, recreation, and resource extraction. The WEMO determined that projects that include solar development will have adverse impacts on the remaining protected areas and associated sensitive species. Elements of the WEMO Plan adopted in this PA/EIS/EIR include "take" avoidance measures presented in Section 2.2.4 of the Final EIR/EIS for the WEMO related to desert tortoise, Mohave ground squirrel, bats, mammals, raptors, reptiles and plants.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC §§661-666) applies to any federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the NEPA process and Section 404 permit process.

3.3.3.2 State

California Endangered Species Act

The CESA (Fish and Game Code §2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species that are listed or candidates for listing by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects are not listed by the State. Take is defined similarly to but more narrowly than FESA and is prohibited for listed species. Take authorization for listed and candidate species may be obtained by the project applicant from CDFW under CESA Sections 2081 or 2080.1 if incidental to otherwise lawful development projects. In this case, private developers consult with CDFW to develop a set of measures and standards for managing the listed or candidate species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

California Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 directs the CDFW to carry out the Legislature's intent to “preserve, protect and enhance rare and endangered plants in this State.” The NPPA gave the California Fish and Game Commission the power to designate native plants as “endangered” or “rare” and protect endangered and rare plants from take. The CESA expanded on the original NPPA and enhanced legal protection for plants, but the NPPA remains part of the Fish and Game Code. To align with federal regulations, the CESA created the categories of “threatened” and “endangered” species. It converted all “rare” animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in the CESA, mitigation measures for impacts to rare plants are specified in a formal agreement between CDFW and the project proponent.

California Desert Native Plants Act

The purpose of the CDNPA is to protect certain species of California desert native plants from unlawful harvesting on both public and privately owned lands. The CDNPA only applies within the boundaries of Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. Within these counties, the CDNPA prohibits the harvest, transport, sale, or possession of specific native desert plants unless a person has a valid permit or wood receipt, and the required tags and seals.

Porter-Cologne Water Quality Control Act

The intent of the Porter-Cologne Water Quality Control Act (Water Code Div. 7, §13000 et seq.) is to protect water quality and the beneficial uses of water, and applies to both surface and groundwater. Under this law, the California State Water Resources Control Board develops statewide water quality plans, and the Regional Water Quality Control Boards (RWQCBs) develop basin plans that identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans. Waters regulated under Porter-Cologne include isolated waters that no longer are regulated

by USACE. Developments which impact jurisdictional waters must demonstrate compliance with the goals of the Act by developing Storm Water Pollution Prevention Plans (SWPPP), Standard Urban Storm Water Mitigation Plans, and other measures in order to obtain a Clean Water Act Section 401 certification.

Lake and Streambed Alteration Program

Prior to commencement of any activity that would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank (which may include associated riparian resources) of a river, stream or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, the applicant shall submit a complete Lake or Streambed Alteration Program (LSAP) notification package and fee to the CDFW. The LSAP is a California law that requires that any person, state or local government agency, or public utility notify the CDFW prior to beginning of the activities listed above. The CDFW has 30 days to review the proposed actions and propose measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the project proponent becomes the LSAP. The conditions of agreement and a Clean Water Act Section 404 permit often overlap.

3.3.3.3 Local

San Bernardino County General Plan

The following policies identified in the Conservation (CO) and Circulation and Infrastructure (CI) elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

> ***Policy CO 2.1.*** The County will coordinate with state and federal agencies and departments to ensure that their programs to preserve rare and endangered species and protect areas of special habitat value, as well as conserve populations and habitats of commonly occurring species, are reflected in reviews and approvals of development programs.
>
> ***Policy CO 2.4.*** All discretionary approvals requiring mitigation measures for impacts to biological resources will include the condition that the mitigation measures be monitored and modified, if necessary, unless a finding is made that such monitoring is not feasible.
>
> ***Policy D/CO 1.2.*** Require future land development practices to be compatible with the existing topography and scenic vistas, and protect the natural vegetation.
>
> ***Policy D/CO 1.3.*** Require retention of existing native vegetation for new development projects, particularly Joshua trees, Mojave yuccas and creosote rings, and other species protected by the Development Code and other regulations. This can be accomplished by:
>
> a) Requiring a landscape plan, approved as part of the location and development plan review and approval process for all new development projects.
>
> b) Requiring the Building Official to make a finding that no other reasonable siting alternatives exist for development of the land prior to removal of a protected plant.
>
> c) Encourage on-site relocation of Joshua trees and Mojave yuccas. However, if on-site relocation is not feasible require developers to consult a list that will be established

and maintained in the County Building and Safety Office of residents willing to adopt and care for relocated trees.

d) The developer/home builder shall bear the cost of tree or yucca relocation.

e) Retention and transplantation standards will follow best nursery practices.

Policy D/CO 1.5. Mechanical removal of vegetation shall be minimized and limited to the building pad, driveway and areas prepared for permitted accessory uses.

Policy D/CO 1.6. In the landscaping of individual sites, native and other drought tolerant plants shall be encouraged.

Policy CI 13.2. Promote the implementation of low impact design principles to help control the quantity and improve the quality of urban runoff. These principles include:

a) Minimize changes in hydrology and pollutant loading; ensure that post development runoff rates and velocities from a site do not adversely impact downstream erosion, and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces; and maximize percolation of stormwater into the ground where appropriate.

b) Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels;

c) Preserve wetlands, riparian corridors, and buffer zones; establish reasonable limits on the clearing of vegetation from the project site;

d) Establish development guidelines for areas particularly susceptible to erosion and sediment loss;

e) Require incorporation of structural and non-structural BMPs to mitigate projected increases in pollutant loads and flows.

3.3.4 Analytical Methodology

This analysis of potential impacts of the Proposed Action and alternatives on vegetation resources relies on a literature review, biological reconnaissance surveys, and coordination with appropriate permitting agencies including the USFWS and CDFW. In addition to reviewing the results of focused biological studies that are described in Section 3.3.1, a literature review was conducted to determine the federal and state-listed endangered, threatened, rare, and special-status plant species that have potential to occur on the Project site. This review included a search of the CNDDB Electronic Inventory for the nine USGS 7.5’ topographic quadrangles that surround the Project site, as well as federal and State publications. Sources also reviewed related to BLM Sensitive species in the California Desert District Office area include the CDCA Plan (BLM, 1999) and WEMO Plan (BLM, 2005).

This section analyzes potential impacts to vegetation resources from construction, operation, maintenance, and decommissioning of the Proposed Action and alternatives, as well as the implementation of mitigation measures that would avoid or minimize such impacts. This analysis addresses potential impacts of the Project to special-status plant species, sensitive natural communities, and other vegetation resources. Direct, indirect, and cumulative impacts are analyzed and quantified.

Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state. In desert ecosystems, the definition of permanent impacts must reflect the slow recovery rates of its plant communities. For the purposes of this analysis, and following CDFW guidance, all ground disturbance activity is considered a permanent impact due to the long time period for natural revegetation to occur in the desert. Natural recovery rates from disturbance in desert ecosystems depend on the nature and severity of the impact. For example, creosote bushes can resprout a full canopy within 5 years after damage from heavy vehicle traffic; however, for larger magnitude projects, severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery with complete ecosystem recovery requiring over 3,000 years (Lovich and Bainbridge, 1999).

The analysis and environmental protection measures presented in this PA/EIS/EIR were reviewed to provide consistency with approved mitigation measures and/or prescriptions that were presented in the WEMO Plan relating to desert restoration, public education, and limitations on cumulative new surface disturbance (BLM, 2005). Means to avoid or minimize environmental harm consistent with the WEMO Plan have been adopted.

3.3.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Proposed Action or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects to vegetation, wetland, and riparian resources. These measures primarily were intended to avoid or reduce potential direct and indirect Project impacts to wildlife resources, specifically to desert tortoise and its habitat; however, they also would reduce Project impacts to vegetation resources identified in this chapter.

APM 34: The site shall be revegetated after decommissioning according to the Final Closure Plan prepared in conformance with BLM requirements at the time of decommissioning.

APM 35: Preconstruction Surveys for Rare or Special-Status Plant Species and Cacti. Before construction of a given phase begins, the Applicant will stake and flag the construction area boundaries, including the construction areas for the solar arrays and associated infrastructure; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A BLM-approved biologist will then survey all areas of proposed ground disturbance for rare or special-status plant species and cacti during the appropriate period (blooming or otherwise identifiable) for those species having the potential to occur in the construction areas. All rare or special-status plant species and cacti observed will be flagged for transplantation.

APM 36: Vegetation Resources Management Plan. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components:

a) Vegetation Salvage plans that discuss the methods that will be used to transplant cacti present within the proposed disturbance areas following BLM's standard operating

procedures, as well as methods that will be used to transplant special-status plant species that occur within proposed disturbance areas.

b) Restoration plans discussing the methods that will be used to restore any of the four native plant community types (creosote bush-white bursage scrub, cheesebush scrub, creosote bush scrub, and smoke tree woodland) present within the Project right-of-way that may be temporarily disturbed by construction activities. The Applicant would obtain BLM approval for any seed mix used for restoration.

c) Vegetation Salvage and Restoration plans that will specify success criteria and performance standards. The Applicant will be responsible for implementing the VRMP according to BLM requirements.

APM 37: Mitigate Direct Impacts to Rare or Special-Status Plants. To the extent feasible, the Project will be designed to avoid impacts to the Emory's crucifixion-thorn population within the project ROW. No construction shall be allowed within a 100-foot buffer area around the Emory's crucifixion-thorn population. All other California Rare Plant Rank (CRPR) 1 and 2 plant occurrences within the Project ROW will be documented during preconstruction surveys. The Applicant will also provide a 100-foot buffer area surrounding each avoided occurrence, in which no construction activities will take place, if feasible. If avoidance is not feasible, the Applicant will provide on-site mitigation (e.g., vegetation salvage) for impacts to rare plants.

APM 38: Herbicides shall not be applied systemically over the entire project area. Herbicides shall be applied in focused treatments in areas where invasive weed infestations have been identified, such as where there is a clump or monotypic stand of invasive weeds. Herbicides shall not be applied within 100 feet of a special-status plant or Emory's crucifixion thorn.

APM 39: Only a State of California and federally certified contractor (i.e., Qualified Applicator), who is also approved by BLM, and holds and maintains a Qualified Applicator License from California Department of Pesticide Regulation, will be permitted to perform herbicide applications. Herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow USEPA label instructions.

APM 40: Herbicides shall not be applied during rain events, within 48 hours of a forecast rain event with a 50 percent or greater chance of precipitation or when wind velocity exceeds 10 miles per hour (mph) (for liquids) and 15 mph for granular herbicides.

APM 50: The Applicant will implement an Integrated Weed Management Plan to control weed infestations and the spread of noxious weeds on the Project site.

3.3.6 Direct and Indirect Effects

3.3.6.1 Alternative A: Proposed Action

Potential direct impacts on vegetation include disruption, trampling, or removal of rooted vegetation resulting in a reduction in the total acres of native vegetation and actions that unequivocally cause a reduction of total numbers of plants and/or reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts also could include decreased plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Indirect impacts can occur later in time or be farther removed in distance while still being reasonably foreseeable and related to the project. Potential indirect impacts of the Proposed Action include the introduction of invasive species by various vectors or conditions that compete with native species and can result in habitat degradation.

A summary of the overall acreages of impacts associated with the Proposed Action and alternatives is provided in Table 3.3-2. Acreages calculated for impacts were based on the best information available at the time of publication of the PA/EIS/EIR for permanent disturbance areas. These acreages are based on information provided by the Applicant regarding construction of each Project component.

Construction

Native Vegetation Communities

Mojave creosote bush scrub, comprising both *Larrea tridentata –Ambrosia dumosa* Shrubland Alliance and *Larrea tridentata* Shrubland Alliance, s the dominant native vegetation community on the Project site and constitutes 2,450 acres of the disturbance area (Table 3.3.-2). Cheesebush scrub (5.57 acres) and developed lands (8.27 acres) constitute relatively smaller portions of the Project disturbance area (Table 3.3-2). Direct impacts to native vegetation communities include the permanent loss of native plants and fragmentation from adjacent or nearby native vegetation communities. Other temporary indirect impacts from the Proposed Action could occur to surrounding vegetation communities from grading activities disturbing soils and creating air-born, fugitive dust, which may impede photosynthesis and other metabolic processes, or sedimentation to or erosion of vegetated areas. This impact would be reduced through the implementation of APM 50 and Mitigation Measures 3.3-1 through 3.3-5, which identify measures to avoid and minimize impacts to native plant communities. Compensation for the loss of desert tortoise habitat will additionally reduce and mitigate impacts to native vegetation communities, as discussed in Section 3.4, *Biological Resources - Wildlife*.

Stabilized and Partially Stabilized Dunes and Sand Transport Corridor

As presented in the BRTR in Appendix E-1, sand dunes do not occur on the Project site and would not be impacted by the Proposed Action (Panorama Environmental, Inc., 2013). The dominant wind direction in the area is from the west and south, such that stabilized and partially stabilized dune habitat located approximately 500 to 1,000 feet south of the proposed location of the South Arrays is typically upwind from the Project site. Thus, it is unlikely that aeolian sand from the dune areas would be transported through the Project site by wind. Additionally, there are a number of hills that would likely block aeolian sand transport between dune areas and the Project site (Panorama Environmental, Inc., 2013).

Ephemeral Drainages (Waters of the State)

Direct impacts include permanent loss of hydrological, geomorphic, and biological functions and values in up to 498.68 acres of vegetated and unvegetated ephemeral dry washes that are characterized as “waters of the State” within the Project site (Figure 3.3-2; Table 3.3-5). Direct impacts to waters of the State during the construction phase of the Proposed Action would be

associated with road construction and the installation of array support structures. General grading within the fenced Project site is not proposed and solar arrays would be carried and hand-installed on support structures with much of the ground area remaining intact. Thus, the direct impact to waters of the State would be considerably smaller than the value presented above. Note that waters of the U.S. do not occur on the Project site.

Indirect impacts to waters of the State include potential alterations to hydrological connectivity to areas downstream of the Project site, which include vegetated and unvegetated ephemeral dry wash. Other indirect impacts include head-cutting on drainages upslope and erosion/sedimentation downslope from the Project site. While ephemeral drainages on the Project site would be subject to disturbance, the Proposed Action would be designed to maintain predevelopment hydraulic conditions. Microphyll woodland habitat does not occur on the Project site or downstream from the site and would not be impacted by the Proposed Action. The implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-5 would avoid or reduce some of the direct and indirect construction-related impacts to ephemeral drainages (i.e., waters of the State).

Special-Status Plants - Direct Impacts

No federal or state-listed plant species occur within the study area, and so none would be directly affected. No direct impacts are anticipated to special-status plants on the Project site. Protective buffers around the two Emory's crucifixion-thorn stands in the Project site, as required by Mitigation Measure 3.3-3, would ensure no direct impacts to this species occur.

It is possible that new special-status plant populations could establish on the Project site prior to construction and could be directly impacted by the Proposed Action. The implementation of Mitigation Measure 3.3-3, which would avoid and minimize special-status plant impacts and salvage protected cacti, would reduce these impacts.

Special-Status Plants - Indirect Impacts

Indirect impacts to special-status plants may occur within and outside the Project disturbance area during and following construction. Potential indirect effects to special-status plants include: facilitating the introduction and spread of invasive plant species; altering surface hydrology in downstream off-site areas and the geomorphic processes that support rare plants and their habitat (e.g., disrupted aeolian and fluvial sand transport processes from obstructions and diversions); fragmenting plant populations and potentially disrupting gene flow; disruption of pollinators; increased risk of fire; disturbance of the structure and ecological functioning of biological soil crusts, which may affect seed germination, reduce soil nutrition, and render the soil vulnerable to water and wind erosion; herbicide and other chemical drift; and disruption of photosynthesis and other metabolic processes from fugitive dust during Project construction and operation.

APM 50 provides the Applicant's proposal for the management of invasive plants through the implementation of a Project-specific Integrated Weed Management Plan (IWMP). The Applicant's draft IWMP is provided in Appendix E-2). The draft IWMP provides an assessment of each invasive plant species known to occur on or adjacent to the Project site, including details of weed management treatment schedule and control options for each species.

The draft IWMP describes both preventative and eradication and control measures, including the use of herbicides. Herbicide use poses a risk to terrestrial and aquatic vegetation as many herbicides are non-selective and could adversely impact non-target vegetation. The draft IWMP proposes specific measures to reduce the risk of indirect impacts from herbicide use These include avoiding application near wetlands, open or flowing water, or other sensitive resources such as special status plants, and storing, transporting, and mixing herbicides in a manner that would prevent accidental release. Contractors would be trained to safely handle herbicides to avoid spills and would be equipped with spill kits to allow for quick and effective response.

The IWMP also describes proposed usage and formulations of herbicides to be used on the Project site; herbicides would be used in accordance with the measures and standard operating procedures in the BLM's 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (Herbicide FPEIS). Only herbicides approved for use on public land by the BLM, California Department of Pesticide Regulation, and CDFW would be used. These herbicides are listed in the Herbicide FPEIS. As described in the draft IWMP, the Applicant would submit pesticide use proposals (PUPs) to the BLM Barstow Field Office and California State Office and obtain approval of the PUPs from the State Office prior to application of any pesticides or herbicides on BLM-administered lands. Following use of herbicides, the Applicant would submit pesticide application records (PARs) to the Barstow Field Office within 24 hours.

Complying with the measures and standard operating procedures in the Herbicide FPEIS, and the implementation of measures described in the IWMP, would avoid potential adverse effects of herbicides to native vegetation and special-status plants.

The impacts of stressors (such as the spread of invasive plants, hydrologic and geomorphic alterations, etc.) on special-status plants are well-documented in the literature. The implementation of APM 50, and of Mitigation Measure 3.3-2 which describes further requirements for the final IWMP, would ensure that the Proposed Action does not cause adverse impacts from the introduction of invasive species during Project construction.

Cacti and Native Trees

It is anticipated that all cacti and native trees that occur within the Project site would be directly affected during the site development stage of the project. The implementation of Mitigation Measure 3.3-2, which would limit site disturbance, and Mitigation Measure 3.3-3, which requires a Vegetation Resources Management Plan that includes preconstruction surveys and salvage actions for protected cacti, would reduce these impacts.

Operation and Maintenance

Invasive Non-Native Plants

The maintenance of access roads both within and outside the Project site boundary has the potential to introduce invasive plant species into disturbed areas and facilitate the spread of invasive weeds. Vehicles and crews inadvertently could track in clinging seeds and/or parts of

invasive weeds, thus facilitating their spread. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce these impacts.

Native Vegetation Communities and Special-status Plants

Similar to construction, operation and maintenance activities could result in the generation of fugitive dust, which could affect surrounding vegetation communities and special–status plants. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce these impacts.

Decommissioning

Decommissioning is anticipated to only directly affect areas that were previously disturbed during installation of the facilities. Thus, the direct removal of native vegetation communities and special-status plants is not anticipated during site decommissioning. Potential direct and indirect effects to special-status plant populations include the introduction of fugitive dust on exposed topsoil and colonization of the Project site by invasive species during and following site decommissioning.

No impacts are anticipated to special-status plant species, sensitive natural communities, or riparian habitat and state-jurisdictional resources, respectively, during site decommissioning.

3.3.6.2 Alternative B

Alternative B consists only of the East and South Arrays as described for the Proposed Action; no North Array would be constructed. Direct impacts on vegetation resources would be similar in nature to the Proposed Action, though anticipated impacts on vegetation resources would be reduced. The types of impacts that would occur under Alternative B similarly would result in the direct and permanent loss of vegetation communities within the disturbance footprint, and indirect impacts to vegetation resources would be similar to those discussed for the Proposed Action. No direct impacts to special-status plants would occur under Alternative B.

Indirect impacts to special-status plants such as the potential for spread of invasive weeds would be reduced under Alternative B in direct proportion to the reduced size of the alternative as compared to the Proposed Action. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce the potential indirect impacts related to the introduction of invasive species during Project construction, operation, maintenance, and decommissioning.

Botanical surveys of the Project site documented the presence of non-listed cacti, but their specific distribution was not mapped. Therefore, the species and number of individual cacti that would be impacted under Alternative B are not known. Based on the reduced size of Alternative B, the number of impacted individual cacti under Alternative B is estimated at between 20 to 30 percent less than under the Proposed Action. Impacts to individual native desert trees, which are identified in the BRTR (Appendix E-1, Figure 3.2-3), would be the same between Alternative B and the Proposed Action. The implementation of Mitigation Measure 3.3-3, which requires a Vegetation Resources Management Plan that includes preconstruction surveys and salvage activities for protected cacti, would reduce these impacts.

Impacts to vegetation communities under Alternative B are presented in Table 3.3-2. Alternative B would affect 1,811.9 acres of natural habitat composed of Mojave creosote bush scrub. The reduced direct impacts to native vegetation communities under Alternative B are directly proportional to the reduced size of the alternative compared to the Proposed Action. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce direct and indirect impacts to native vegetation communities. Separate compensation for loss of desert tortoise habitat is detailed in Section 3.4, *Biological Resources - Wildlife*.

Potential indirect impacts to native vegetation communities would be similar to those discussed for the Proposed Action. The impact of dust generated by the Project on native vegetation would be somewhat lessened by the implementation of Mitigation Measures 3.3-2 (erosion control measures and restoration of temporarily disturbed areas) and 3.19-2 (Comprehensive Drainage, Stormwater, and Erosion Control Plan).

Ephemeral drainages have broad distribution in the area proposed for the North Array. Thus, because the North Array would not be constructed under Alternative B impacts to waters of the State would be greatly reduced. Alternative B would impact up to 348.89 acres of waters of the State and have fewer impacts on ephemeral drainages than the Proposed Action (Table 3.3-5). The overall magnitude of the impact would be reduced as a result of the implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-4.

No federally protected wetlands occur on the Project site. Thus, Alternative B would not impact federally protected wetlands through direct removal, filling, hydrological interruption, or other means, as defined by Clean Water Act Section 404.

3.3.6.3 Alternative C

Alternative C consists only of the North and South Arrays as described for the Proposed Action; no East Arrays would be constructed. Direct impacts on vegetation resources would be similar in nature, though anticipated impacts on vegetation resources would be reduced as compared to the Proposed Action. The types of impacts that would occur under Alternative C similarly would result in the direct and permanent loss of vegetation communities within the disturbance footprint, and indirect impacts to vegetation resources would be similar to those discussed for the Proposed Action. No direct impacts to special-status plants would occur under Alternative C.

Indirect impacts to special-status plants, such as the potential for spread of invasive weeds, would be reduced under Alternative C in direct proportion to the reduced size of the alternative as compared to the Proposed Action. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce the potential indirect impacts related to the introduction of invasive species during Project construction, operation, maintenance, and decommissioning.

Botanical surveys of the Project site quantified non-listed cacti and several protected trees, but their specific distribution was not mapped. Therefore, the species and number of individual cacti that would be impacted under Alternative C are not known. Based on the reduced size of Alternative C, the number of impacted individual cacti under Alternative C is estimated at 25 to

30 percent less than under the Proposed Action. Impacts to individual native desert trees, identified in the BRTR (Appendix E-1, Figure 3.2-3), would be the same between Alternative C and the Proposed Action. The implementation of Mitigation Measure 3.3-3, which requires a Vegetation Resources Management Plan that includes preconstruction surveys and salvage activities for protected cacti, would reduce these impacts.

Impacts to vegetation communities under Alternative C are presented in Table 3.3-2. Under this alternative, the Project would affect 2,021.60 acres of natural habitat composed of Mojave creosote bush scrub. The reduced direct impacts to native vegetation communities under Alternative C are directly proportional to the reduced size of the alternative as compared to the Proposed Action. The implementation of APM 50 and Mitigation Measure 3.3-2 would reduce direct and indirect impacts to native vegetation communities. Separate compensation for loss of desert tortoise habitat is detailed in Section 3.4, *Biological Resources - Wildlife*.

Potential indirect impacts to native vegetation communities would be similar to those discussed for the Proposed Action. The impact of dust generated by the Project on native vegetation would be somewhat lessened by the implementation of Mitigation Measures 3.3-2 (erosion control measures and restoration of temporarily disturbed areas) and 3.19-2 (Comprehensive Drainage, Stormwater, and Sedimentation Control Plan).

Ephemeral drainages are commonly distributed within the areas proposed for the North and South Arrays, and less common in the area proposed for the East Arrays. Thus, the removal of the East Arrays from this alternative results in a small reduction in impacts to waters of the State. Alternative C would impact up to 462.72 acres of waters of the State and have fewer impacts on ephemeral drainages than the Proposed Action (Table 3.3-5). The overall magnitude of the impact would be reduced through the implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-4.

No federally protected wetlands occur on the Project site. Thus, Alternative C would not impact federally protected wetlands through direct removal, filling, hydrological interruption, or other means, as defined by Clean Water Act Section 404.

3.3.6.4 Alternative D

Alternative D comprises a smaller footprint for the proposed South and East Arrays. Direct impacts on vegetation resources would be similar in nature, though anticipated impacts on vegetation resources would be reduced as compared to the Proposed Action. The types of impacts that would occur under Alternative D similarly would result in the direct and permanent loss of vegetation communities within the disturbance footprint, and indirect impacts to vegetation resources would be similar to those discussed for the Proposed Action. No direct impacts to special-status plants would occur under Alternative D.

Indirect impacts to special-status plants such as the potential for spread of invasive weeds would be reduced under Alternative D in direct proportion to the reduced size of the alternative as compared to the Proposed Action. The implementation of APM 50 and Mitigation Measure 3.3-2

would reduce the potential indirect impacts related to the introduction of invasive species during Project construction, operation, maintenance, and decommissioning.

Botanical surveys of the Project site quantified non-listed cacti and several protected trees, but their specific distribution was not mapped. Therefore, the species and number of individual cacti that would be impacted under Alternative D are not known. Based on the reduced size of Alternative D, the number of impacted individual cacti under Alternative D is estimated at 25 to 35 percent less than under the Proposed Action. Impacts to individual native desert trees, identified in the BRTR (Appendix E-1, Figure 3.2-3), would be the same between Alternative D and the Proposed Action. The implementation of Mitigation Measure 3.3-3, which requires a Vegetation Resources Management Plan that includes preconstruction surveys and salvage activities for protected cacti, would reduce these impacts.

Impacts to vegetation communities under Alternative D are presented in Table 3.3-2. Under this alternative, the Project would affect 1,868.94 acres of natural habitat consisting of Mojave creosote bush scrub. The reduced direct impacts to native vegetation communities under Alternative D are directly proportional to the reduced size of the alternative as compared to the Proposed Action. The implementation of Mitigation Measure 3.3-2 would reduce direct and indirect impacts to native vegetation communities. Separate compensation for loss of desert tortoise habitat is detailed in Section 3.4, *Biological Resources - Wildlife*.

Potential indirect impacts to native vegetation communities would be similar to those discussed for the Proposed Action. The impact of dust generated by the Project on native vegetation would be somewhat lessened by the implementation of Mitigation Measure 3.3-2 (erosion control measures and restoration of temporarily disturbed areas) and 3.19-2.

Removing South Array 3 under Alternative D would result in a small reduction in impacts to waters of the State. Alternative D would impact up to 446.44 acres of waters of the State and have fewer impacts on ephemeral drainages than the Proposed Action (Table 3.3-5). The overall magnitude of the impact would be reduced by the implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-4.

No federally protected wetlands occur on the Project site. Thus, Alternative D would not impact federally protected wetlands through direct removal, filling, hydrological interruption, or other means, as defined by Clean Water Act Section 404.

3.3.6.5 Alternative E: No Action/No Project

Under this alternative, the Project would not be approved and lands administered by the BLM would continue to be managed consistent with current land use designations in the CDCA Plan. If Alternative E were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting described in Section 3.3.2 would be maintained. As a no-development alternative, this No Action/No Project Alternative would result in no changes to the vegetation resources described above.

3.3.6.6 Alternative F: CEQA No Project

Under Alternative F, a PV solar energy facility and related infrastructure could be developed on the same site as the Proposed Action, but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. Furthermore, all alternatives previously described (Proposed Action or Alternative B, C, or D) could be accommodated.

Alternative F would occupy a similar footprint to the Proposed Action and Alternatives B, C or D and would generate similar impacts to vegetation resources related to construction, operation, maintenance, and decommissioning to those of the Proposed Action, and comparable to those under Alternatives B, C, and D. Importing water to the Project site would not affect vegetation resources.

3.3.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under this alternative, the Project would not be approved and lands administered by the BLM would continue to be managed consistent with current land use designations in the CDCA Plan, except that the CDCA Plan would be amended to designate the requested ROW area as unsuitable for solar development. If Alternative G were selected, no Project-specific changes would be implemented on the site and the existing environmental setting described in Section 3.3.2 would be maintained. As a no-development alternative, Alternative G would result in no changes to the vegetation resources described above.

3.3.7 Cumulative Effects

The geographic scope for this cumulative impact analysis considers the incremental effects of the analyzed alternatives relative to other past, present, and reasonably foreseeable projects that affect the vegetation resources that would be affected by the Project. For vegetation resources, the geographic scope of analysis is based on species distribution and landforms surrounding the Project site and the natural boundaries of the resource affected, rather than jurisdictional boundaries. More specifically, the analysis considers potential effects to vegetation resources and waters of the State, with the analysis generally concentrating on such resources in the I-15 corridor, Soda Mountain valley, and the Soda Mountain range and adjacent mountain ranges in eastern San Bernardino County.

In addition to construction-related impacts, the Project would have ongoing operational impacts to biological resources. Therefore, the temporal scope of the cumulative effects analysis for sensitive vegetation communities includes the construction, operation and maintenance, and decommissioning phases of the Project.

The region in which the Project site is located has seen limited past development at the scale presented by current and future solar development. Past and current development in the vicinity of the Project have included minor improvements to the I-15 transportation corridor and utility

corridors. Any ongoing impacts of these past projects are reflected in the description of the existing environment in Section 3.3.2.

Table 3.1-3 lists other current and foreseeable projects near the Project site, including other proposed or approved renewable energy projects. Three projects were identified within a 10-mile radius of the Project site that would cause impacts that could combine with those of the Project: the XpressWest High Speed Passenger Rail Project that parallels I-15 from Victorville to Las Vegas; the Calnev Pipeline Expansion Project that also parallels I-15; and the Silurian Valley Wind Project, located approximately 8 miles northeast of the Project site. Both the XpressWest and Calnev projects traverse the Project study area and are considered in this analysis. By contrast, the Silurian Valley Wind Project is beyond the reasonable distance at which cumulative effects are expected to vegetation resources.

The XpressWest railroad and Calnev pipeline projects would be constructed on the northwest side of I-15 as it passes through the Project site. Vegetation resources have not been characterized in these portions of the Project site, but impacts to vegetation resources can be estimated based on conditions found in nearby portions of the Project site. Beginning with the installation of wildlife and erosion control fencing and continuing through all phases of these projects, the XpressWest and Calnev projects could result in temporary and permanent changes to waters of the State, impacts to special-status plants, and possibly to sensitive vegetation communities.

3.3.7.1 Sensitive Natural Communities

The construction of the XpressWest and Calnev projects would result in temporary and permanent conversion of desert habitat to industrial and commercial uses. The principal vegetation community on the Project site is Mojave creosote bush – White bursage scrub; whereas the XpressWest site supports Joshua tree wooded shrubland (278 acres) and mesquite shrubland (20.1 acres), and relatively little “Mojave creosote” (4.6 acres) (FRA, 2011). The Calnev project would affect approximately 1,784 acres of native vegetation which includes 1,188 acres of Mojave creosote bush – White bursage scrub (BLM, 2012). Because Mojave creosote bush – White bursage scrub is not identified as a BLM or CDFW sensitive vegetation community, and the Proposed Action would not impact any sensitive native vegetation communities, no significant cumulative impacts would occur to sensitive vegetation communities.

As identified in Table 3.3-5, approximately 498.68 acres of dry wash habitat was identified that is subject to CDFW jurisdiction as waters of the State. Construction of the XpressWest and Calnev projects are similarly expected to impact jurisdictional waters. The EIS for the XpressWest project did not identify or characterize potential impacts to waters of the State; though 5.96 acres of direct permanent impact were identified to waters of the U.S. (FRA, 2011). The Calnev project would result in adverse impacts to federally protected wetlands at an estimated 766 locations throughout the 234.4-mile length of the pipeline, totaling 138.9 acres (BLM, 2012). The analysis did not quantify waters of the State; however, CDFW jurisdiction was presumed at crossing sites. These effects are considerably less than the Proposed Action. The implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-4 would ensure that jurisdictional areas affected by the Project are adequately compensated for and equivalent habitat would be protected off-site.

Implementation of these measures would reduce the Project's contribution to cumulative impacts on sensitive natural communities.

3.3.7.2 Special-Status Plant Species

The development of numerous large-scale projects, such other wind and solar generation facilities, would result in a substantial permanent conversion of desert habitat to industrial and commercial uses, which would remove habitat for many special-status plant species and cacti. Therefore, the loss of this habitat is anticipated to result in substantial cumulative impacts on populations of many special-status plant species and cacti. The XpressWest and Calnev projects are located on a fairly narrow transportation and utility corridor located adjacent to I-15. No threatened or endangered plants were identified in the Project study area that would be impacted by these projects. Additionally, the Proposed Action would not impact special-status plants. Each of these projects would; however, affect native cacti. The implementation of Mitigation Measures 3.3-2 (vegetation best management practices) and 3.3-3 (special-status plant species and cacti impact avoidance and minimization), will provide for the salvage of protected cacti and the avoidance of special-status plants that occur on the Project site. The implementation of these measures would reduce the Project's contribution to a cumulative impact on cacti and special-status plants.

3.3.7.3 Decommissioning and Restoration

Potential cumulative impacts to vegetation resources that may occur during site decommissioning and restoration are similar to those described for construction, though the magnitude of the impact would be considerably less because restoration would occur within previously disturbed areas. Upland habitat and unvegetated washes that were previously disturbed by the Project would be restored during decommissioning. It is anticipated that the Calnev and XpressWest projects would be constructed at the time of decommissioning and that potential the effects of these projects on vegetation resources would be reduced over time. The implementation of Mitigation Measure 3.3-5 (Decommissioning and Reclamation Plan) would reduce the Project's contribution to a cumulative impact on vegetation resources.

3.3.8 Mitigation Measures

Mitigation Measure 3.3-1: Designated Biologist. The Applicant shall assign at least one Designated Biologist to the Project. The Applicant shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the BLM Authorized Officer (AO) for approval in consultation with CDFW and USFWS.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

3. Have at least one year of field experience with biological resources found in or near the Project site;

4. Meet the current USFWS Authorized Biologist qualifications criteria (www.fws.gov/ventura/speciesinfo/protocols_guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS;

5. Possess a CESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the BLM AO, in consultation with CDFW and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the mitigation measures.

Mitigation Measure 3.3-2: Vegetation Best Management Practices. The Applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to vegetation resources:

1. *Limit Area of Disturbance*. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, Project vehicles and equipment shall be confined to the flagged areas.

2. *Minimize Road Impacts*. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. *Minimize Traffic Impacts*. Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited.

4. *Monitor During Construction*. In areas that have not been fenced with desert tortoise exclusion fencing and cleared, a Designated Biologist shall be present at the construction site during all Project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall review areas immediately ahead of equipment during brushing and grading activities.

5. *Minimize Impacts of Staging Areas*. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing. For construction activities outside of the solar plant site, access roads, pulling sites, and storage and parking areas shall be designed, utilized, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources.

6. *Avoid Use of Toxic Substances*. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to plants and wildlife.

7. *Implement Erosion Control Measures*. Standard erosion control measures shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter "waters of the State". Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into drainages. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential. To avoid impacts associated with generation of fugitive dust, surface application of water would be employed during construction and operation and maintenance activities.

8. *Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization*. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

9. *Revegetation of Temporarily Disturbed Areas*. The Applicant shall prepare and implement a Revegetation Plan to restore all areas subject to temporary disturbance to pre-Project grade and conditions. Temporarily disturbed areas within the Project site include, but are not limited to: all proposed locations for linear facilities, temporary access roads, berms, areas surrounding the drainage diffusers, construction work temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas. The Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and the following performance standards by the end of monitoring year 2:

    a. at least 80 percent of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and

    b. relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60 percent.

10. *Integrated Weed Management Plan.* This measure provides further detail and clarifies requirements for the Applicant's draft Integrated Weed Management Plan (IWMP) (see Appendix E-2). Prior to beginning construction on the Project, the Applicant shall prepare, circulate to the BLM for comment and approval, and then implement an IWMP that meets the approval of BLM's Authorized Officer and conforms to the CDCA Plan (Table 1) to prevent the spread of existing invasive species and the introduction of new invasive species to the Project site. The Plan shall be consistent with BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM, 2007) and the National Invasive Species Management Plan (National Invasive Species Council, 2008).

    The IWMP shall include, at a minimum: specific management objectives and measures for each target invasive species; baseline conditions; weed risk assessment; measures (both preventative and containment/control) to prevent/limit the introduction and spread of invasive species; monitoring and surveying methods; and reporting requirements.

    The BLM-approved IWMP shall include:

    a. Preventative measures to prevent the spread of weeds into new habitats, such as equipment inspections, use of weed-free erosion control materials and soils, and a mandatory site training element that includes weed management;

b. Weed containment and control measures such as the removal of invasive species primarily via mechanical means, with the use of herbicides restricted to BLM-policies and approved usage (e.g., BLM's *Herbicide Use Standard Operating Procedures* provided in Appendix B of the Record of Decision for the *Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement* (BLM, 2007);

c. Monitoring and reporting standards annually during construction and for three years following the completion of construction to describe trend in weed distribution and direct weed management measures, and;

d. Reporting of monitoring and management efforts in annual reports and a final monitoring report completed at the end of three years of post-construction monitoring. Copies of these reports will be provided to the BLM for review and comment. The BLM will use the results of these reports to determine if any additional monitoring or control measures are necessary. Weed control will be ongoing on the Project site for the life of the Project, but plan success will be determined by the BLM after the three years of operations monitoring through the reporting and review process. Success criteria will be defined as having no more than 10 percent increase in a weed species or in overall weed cover in any part of the Project site.

Mitigation Measure 3.3-3: Special-Status Plant Species and Cacti Impact Avoidance and Minimization. This measure will avoid unintended impacts to special-status plants on the Project site (i.e., Emory's crucifixion thorn) and provide for the salvage of protected cacti prior to construction. This measure includes the following requirements:

1. The Applicant shall establish Environmental Exclusion Areas (EEAs) around Emory's crucifixion thorn plants that have been identified on the Project site (Figure 3.3-3). A minimum 100-foot exclusion area shall be established around the plants, which shall be clearly identified and maintained throughout construction to ensure that avoided plants are not inadvertently harmed. EEAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages or compensatory mitigation.

2. *Worker Environmental Awareness Program (WEAP)*. The WEAP (APM 44; Mitigation Measure 3.4-1c) shall include training components specific to protection of special-status plants that occur on the Project site.

3. *Herbicide and Soil Stabilizer Drift Control Measures*. Special-status plant occurrences within 100 feet of the Project Disturbance Area, including Utah vine milkweed, shall be protected from herbicide and soil stabilizer drift. The IWMP (APM 50 and Mitigation Measure 3.3-2) includes measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's The Global Invasive Species Team (Hillmer and Liedtke, 2003), the USEPA, and the Pesticide Action Network Database.[5] *Erosion and Sediment Control Measures*. Erosion and sediment control measures shall not inadvertently impact special-status plants (e.g., by using invasive or non-Mojave Desert native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). These measures shall be incorporated in the Comprehensive Drainage, Erosion, and Sedimentation Control Plan (Mitigation Measure 3.19-2).

[5] Available at: http://www.pesticideinfo.org

4. *Preconstruction Cacti Salvage*. The Applicant shall develop a *Vegetation Resources Management Plan* that details the methods for the salvage and transplantation of target succulent species that would be affected by the Project. The Plan shall be submitted to the BLM AO for review and approval and shall include at a minimum the following elements:

    a. The location of target plants on the Project site;

    b. Criteria for determining which individual plants are appropriate for salvage;

    c. The proposed methods for salvage, propagation, transport, and planting;

    d. Procedures for identifying target species during preconstruction clearance surveys;

    e. Considerations for storing salvaged plants or pre-planting requirements;

    f. Suggested transplantation sites;

    g. A requirement for 10 years of maintenance of the transplanted individuals, including removal of invasive species and irrigation (if necessary); and

    h. A requirement for 10 years of monitoring to determine the percentage of surviving plants each year and to adjust maintenance activities using an adaptive management approach.

Mitigation Measure 3.3-4: Impacts to State Waters. The Applicant shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the State and to satisfy requirements of California Fish and Game Code Sections 1600 and 1607.

1. *Acquire Off-Site State Waters*: The Applicant shall acquire, in fee or in easement, a parcel or parcels of land that includes at least 498.68 acres of state jurisdictional waters, or comparable area based on actual project impacts to ephemeral dry wash jurisdictional features (depending upon the selected project alternative and direct project impacts) that meets CDFW mitigation ratios (e.g., 1:1 for no net loss). Mitigation for impacts to state waters shall occur as close to the Project site as possible. If security is posted in accordance with Provision 2 below (*Security for Implementation of Mitigation*), the Applicant shall acquire, in fee or in easement, the land, no more than 18 months after the start of Project ground-disturbing activities.

2. *Security for Implementation of Mitigation*: The Applicant shall provide financial assurances to the BLM AO and CDFW to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the BLM AO and CDFW in the form of an irrevocable letter of credit, a pledged savings account or Security prior to initiating ground-disturbing project activities. Prior to submittal to the BLM AO, the Security shall be approved by the BLM AO, in consultation with CDFW and the USFWS, to ensure funding. Lands may concurrently be used to satisfy the requirements for desert tortoise habitat conservation (see Mitigation Measure 3.4-2d, *Desert Tortoise Compensatory Mitigation* in Section 3.4, *Wildlife*). The final mitigation acreage is also subject to CDFW concurrence with project impacts to waters of the State that were developed by the Applicant.

3. *Preparation of Management Plan*: The Applicant shall submit to the BLM AO and CDFW a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the natural values of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.

4. *Jurisdictional Waters Best Management Practices*: The Applicant shall also comply with the following conditions to protect drainages in and near the Project site:

    a. The Applicant shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

    b. The Applicant shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

    c. Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

    d. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter a drainage by the Applicant or any party working under contract or with the permission of the Applicant, shall be removed immediately.

    e. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State.

    f. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

Mitigation Measure 3.3-5: Decommissioning and Reclamation Plan. At least 12 months prior to Project closure, the Applicant shall prepare a draft Decommissioning and Reclamation Plan to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project site. The Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities, and shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from the BLM AO in consultation with USFWS and CDFW.

3.3.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to vegetation resources would remain. The Proposed Action would cause impacts to vegetation resources, eliminating the Mojave creosote bush scrub vegetation community within the Project site. The Project also would directly and indirectly affect ephemeral dry washes comprising up to 498.68 acres of unvegetated ephemeral dry washes that are regulated as State-jurisdictional ephemeral drainages. Alternatives B, C, and D would have comparable, but reduced impacts on vegetation communities and associated biological resources. As discussed in the sections above, the recommended avoidance and minimization measures as well as compensatory mitigation would offset direct, indirect, and cumulative impacts in varying,

but unquantified degrees, and provide compliance with state and federal laws. It is expected that some unavoidable residual adverse effects would remain after mitigation measures have been applied, including net losses in waters of the State and vegetation resources.

3.3.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section IV, a project would have a significant impact on vegetation resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Only those CEQA significance criteria related to vegetation and riparian resources which include criteria a, in part, b, c, and e are addressed in this section. Those criteria with aspects that pertain to wildlife resources, which include criteria d, f, and wildlife-related aspects of criteria a and e, are analyzed in Section 3.4, *Biological Resources – Wildlife*.

3.3.10.1 Alternative A: Proposed Action

a) Impact Veg-1: The Project would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

Based on the findings of focused botanical surveys that were performed for the Project between 2009 and 2012, no special-status plants (besides protected cacti) were identified on the Project site, and those non-listed special-status plants detected (Emory's crucifixion-thorn and Utah milkvine) would be avoided by proposed activities. Thus, no direct impact is expected to special-status plant populations. However, as discussed in Section 3.3.6, a significant indirect impact could result. The implementation of APM 50 (IWMP) and Mitigation Measure 3.3-2 would reduce the potential for indirect impacts to off-site special-status plant populations (e.g., on-site

colonization or local expansion of invasive plant populations). The implementation of Mitigation Measure 3.3-3 would avoid and minimize special-status plant impacts and salvage protected cacti to reduce these impacts to less than significant. For the reasons discussed in Section 3.3.7, the Project's contribution to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-2: The Project would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Direct and indirect impacts to up to 498.68 acres of waters of the State, which are considered a sensitive natural community by CDFW, would occur during the construction phase associated with road construction and the installation of array support structures, resulting in a significant impact. The implementation of Mitigation Measures 3.3-2 and 3.3-5 would avoid or reduce some of the direct and indirect construction-related impacts to these features. Thus, impacts to this sensitive natural community would be reduced to less than significant with mitigation.

For the reasons discussed in Section 3.3.7, the Project's contribution to cumulative impacts on sensitive natural communities would not be cumulatively considerable.

c) The Project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act. (No Impact)

No federally protected wetlands occur on the Project site, as defined by Section 404 of the Clean Water Act, and no federally protected wetlands would be impacted by the Project. Therefore, no impact would occur and no mitigation is required. Because the Project would cause no impact to federally protected wetlands, it would not cause or contribute to any cumulative effect to them.

e) The Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (No Impact)

The Proposed Action would not conflict with any local policies or ordinances protecting biological resources, including the San Bernardino County General Plan policies described in Section 3.3.3. No impact would occur and no mitigation is required. Because the Project would cause no impact related to consistency with local policies or ordinances, it would not cause or contribute to any related cumulative effect.

3.3.10.2 Alternative B

a) Impact Veg-B1: Alternative B would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of APM 50 and Mitigation Measure 3.3-3. For the reasons discussed in Section 3.3.7, the contribution of Alternative B to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-B2: Alternative B would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative B would impact up to 348.89 acres of waters of the State, representing a significant impact. Implementation of Mitigation Measures 3.3-2 and 3.3-5 would avoid, or reduce some of the direct and indirect construction-related impacts to these features to less than significant. For the reasons discussed in Section 3.3.7, the contribution of Alternative B to cumulative impacts on sensitive natural communities would not be cumulatively considerable.

c) Alternative B would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act. (No Impact)

No federally protected wetlands occur within the boundary of Alternative B, as defined by Section 404 of the Clean Water Act, and no federally protected wetlands would be impacted by Alternative B. Therefore, no impact would occur and no mitigation is required. Because Alternative B would cause no impact to federally protected wetlands, it would not cause or contribute to any cumulative effect to them.

e) Alternative B would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (No Impact)

Alternative B would not conflict with any local policies or ordinances protecting biological resources, including the San Bernardino County General Plan policies described in Section 3.3.3. No impact would occur and no mitigation is required. Because Alternative B would cause no impact related to consistency with local policies or ordinances, it would not cause or contribute to any related cumulative effect.

3.3.10.3 Alternative C

a) Impact Veg-C1: Alternative C would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of Mitigation Measure 3.3-3, and the contribution of Alternative C to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-C2: Alternative C would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative C would impact up to 462.72 acres of waters of the State, representing a significant impact. The implementation of Mitigation Measures 3.3-2 and 3.3-5 would avoid, or reduce some of the direct and indirect construction-related impacts to these features. Thus, impacts to this sensitive natural community would be less than significant with mitigation, and the contribution of Alternative C to cumulative impacts on sensitive natural communities would not be cumulatively considerable.

c) Alternative C would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act. (No Impact)

No federally protected wetlands occur within the boundary of Alternative C, as defined by Section 404 of the Clean Water Act, and no federally protected wetlands would be impacted by Alternative C. Therefore, no impact would occur and no mitigation is required. Because Alternative C would cause no impact to federally protected wetlands, it would not cause or contribute to any cumulative effect to them.

e) Alternative C would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (No Impact)

Alternative C would not conflict with any local policies or ordinances protecting biological resources, including the San Bernardino County General Plan policies described in Section 3.3.3. No impact would occur and no mitigation is required. Because Alternative C would cause no impact related to consistency with local policies or ordinances, it would not cause or contribute to any related cumulative effect.

3.3.10.4 Alternative D

a) Impact Veg-D1: Alternative D would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of Mitigation Measure 3.3-3, and the contribution of Alternative D to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-D2: Alternative D would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative D would impact up to 446.44 acres of waters of the State, representing a significant effect. The implementation of Mitigation Measures 3.3-2 and 3.3-5 would avoid, or reduce some of the direct and indirect construction-related impacts to these features. Thus, impacts to this sensitive natural community would be less than significant with mitigation incorporated. For the reasons discussed in Section 3.3.7, the contribution of Alternative D to cumulative impacts on sensitive natural communities would not be cumulatively considerable.

c) Alternative D would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act. (No Impact)

No federally protected wetlands occur within the boundary of Alternative D, as defined by Section 404 of the Clean Water Act, and no federally protected wetlands would be impacted by Alternative D. Therefore, no impact would occur and no mitigation is required. Because

Alternative D would cause no impact to federally protected wetlands, it would not cause or contribute to any cumulative effect to them.

e) Alternative D would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (No Impact)

Alternative D would not conflict with any local policies or ordinances protecting biological resources, including the San Bernardino County General Plan policies described in Section 3.3.3. No impact would occur and no mitigation is required. Because Alternative D would cause no impact related to consistency with local policies or ordinances, it would not cause or contribute to any related cumulative effect.

3.3.10.5 Alternative E: No Action/No Project

Alternative E would result in no impacts on vegetation resources, and would not cause or contribute to any related cumulative effect.

3.3.10.6 Alternative F: CEQA No Project

Transportation of water to the Project site would have no effect on vegetation resources independent of other effects that would be caused by whichever action alternative is approved by the BLM. See above.

3.3.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would result in no Project-related direct or indirect impacts to vegetation resources, and would not cause or contribute to any related cumulative effect.

References

Barrows, C.W., and M.F. Allen, 2007. 2005-2006 Coachella Valley MSHCP Monitoring Framework Priorities: Impacts of Exotic Weed Species including Saharan Mustard (*Brassica Tournefortii*). UC Riverside: Center for Conservation Biology.

Brossard, C. C., J. M. Randall, and M. C. Hoshovsky, eds, 2000. Invasive plants of California's wildlands. University of California Press, Berkeley, California, USA.

BLM, 1999. The California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/cdcaplan.Par.15259. File.dat/CA_Desert_.pdf]

BLM, 2005. Final Environmental Impact Report and Statement for the West Mojave Plan. http://www.blm.gov/ca/st/en/fo/cdd/wemo.html.

BLM, 2007. Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States. U.S. Dept. of the Interior. June 2007. [http://www.blm.gov/wo/st/en/prog/more/veg_eis.html]

BLM, 2009. Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species.

BLM, 2012. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/ Environmental Impact Report. Prepared by the U.S. Department of Interior, Bureau of Land Management and County of San Bernardino, March, 2012.

BLM, 2013. Special-status Plants. Online BLM policy statement on special-status plants.[http://www.blm.gov/ca/st/en/prog/ssp.print.html] Accessed June 27, 2013.

Caithness Soda Mountain, LLC, 2010a. Final 2009 Focused Special Status Plant Survey Report, Soda Mountain Solar Project, San Bernardino County, CA (October).

Caithness Soda Mountain, LLC, 2010b. Final 2009 Biological Resources Technical Report, Soda Mountain Solar Project, San Bernardino County, CA (October).

California Department of Fish and Game (CDFG). 2009. Protocol for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.

California Department of Fish and Wildlife (CDFW), 2013, California Natural Diversity Database (CNDDB), Rarefind 4. CDFG's Electronic database, Sacramento, California. Data search for the following 7.5 minute USGS Quadrangles: West of Soda Lake and surrounding 8 quadrangles and San Bernardino County.

California Department of Food and Agriculture (CDFA), 2010. List of noxious weeds. [http://www.cdfa.ca.gov/plant/ipc/weedinfo/winfo_pestrating_2010.pdf]

California Invasive Plant Council (Cal-IPC), 2006. California Invasive Plant Inventory. Cal IPC Publication 2006-02. Berkeley. [http://www.cal-ipc.org/ip/inventory/weedlist.php] Accessed December 9, 2011.

California Native Plant Society (CNPS), 2001. CNPS Botanical Survey Guidelines, December 9, 1983, Revised June 2, 2001.

California Native Plant Society. 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA.

C.S. Ecological Surveys and Assessments, 2013a. Integrated Weed Management Plan Soda Mountain Solar San Bernardino County, CA, BLM Case Number CACA 49584. August 2013.

C.S. Ecological Surveys and Assessments, 2013b. Spring Rare Plant Survey Soda Mountain Solar Project BLM Case # CACA49584 San Bernardino County, California, May 2013.

Federal Railroad Administration (FRA). 2011. Final Environmental Impact Statement and Final Section 4(f) Evaluation for the Proposed DesertXpress High-Speed Passenger Train Victorville, California to Las Vegas, Nevada. U.S. Dept. of Transportation, Federal Railroad Administration, March 2011.

Hillmer, J. and D. Liedtke, 2003. Safe herbicide handling: a guide for land stewards and volunteer stewards. Ohio Chapter, The Nature Conservancy, Dublin, OH. 20 pp.

Lovich, J. and Bainbridge, D., 1999. Anthropogenic Degradation of the Southern California Desert Ecosystem and Prospects for Natural Recovery and Restoration. Environmental Management Vol. 24, No. 3. pp. 309-326.

National Invasive Species Council, 2008. 2008-2012 National Invasive Species Management Plan. Department of the Interior. 35 pp.

Panorama Environmental, Inc., 2013. Biological Resources Technical Report Soda Mountain Solar San Bernardino County, CA BLM Case Number CACA 49584, March 2013.

San Bernardino County, 2007. San Bernardino County General Plan.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, 2nd Edition. California Native Plant Society Press. Sacramento, California.

URS, 2009. Draft Jurisdictional Determination Report, Soda Mountain Solar Project, San Bernardino, California (November 3).

U.S. Army Corps of Engineers (USACE), 1979. Wetland Values: Concepts and Methods for Wetlands Evaluation. Research Report 79-RI. February.

USACE, 2013. Letter from the USACE to Tom Grace, Caithness Soda Mountain, LLC; SUBJECT: Determination regarding requirement for Department of the Army Permit, USACE File No. SPL-2010-01042-SLP, August 21, 2013.

U.S. Fish and Wildlife Service (USFWS), 1996. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants. USFWS, September 23, 1996.

USFWS, 2011. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

Vyverberg, Kris. 2010. A Review of Stream Processes and Forms in Dryland Watersheds. December 2010. Prepared for California Department of Fish and Game.

3.4 Biological Resources – Wildlife

3.4.1 Introduction

This section describes the environmental setting for wildlife resources that are present within the Project site. It summarizes survey findings for special-status wildlife species that were observed or have potential to occur in or near the Project site. Also described here are the existing laws and regulations applicable to potentially affected wildlife resources. During scoping for this PA/EIS/EIR, wildlife concerns raised by the public and responsible agencies included potential direct, indirect, and cumulative impacts on wildlife habitat and special-status species known to occur in the region. Specific comments addressed potential impacts to species including desert tortoise, bighorn sheep, and burrowing owl.

3.4.1.1 Project Site and Study Area Definition

This section uses the term "Project site" to describe the direct footprint of the Project and the phrase "study area" to depict wildlife study areas in and around the Project site. The size and configuration of the Project have been reduced throughout the application and design process, and wildlife study areas have correspondingly decreased in size. The study area for wildlife resources discussed in this section included public lands administered by the BLM and private lands under the land use jurisdiction of San Bernardino County. The study areas for wildlife surveys included the entire footprint of the Project site along with a sizeable buffer, particularly for golden eagle and bighorn sheep (Table 3.4-1) (Panorama Environmental, Inc., 2013a).

TABLE 3.4-1
WILDLIFE STUDY AREAS FOR THE SODA MOUNTAIN SOLAR PROJECT

Resources	Survey Dates	Survey Study Area
Desert tortoise	May 2009	6,770-acre (2009) ROW
	October 2012	220 acres and zone of influence Geotechnical survey routes and locations
Mojave Fringe-toed Lizard	July and August 2009	6,770-acre (2009) ROW plus surrounding lands. Focused surveys performed within 703 acres of habitat located south and southeast of the Project site
Bighorn Sheep and Golden Eagle	March and May 2011	Lands within a 10-mile radius of the boundaries of the Project ROW
Bats	August 2012	Select mines within 10 miles of the Project site (4,559-acre area)
Avian Point Count	Spring and Fall 2009	6,770-acre (2009) ROW

SOURCE: Panorama Environmental, Inc., 2013a

3.4.2 Regional and Local Environmental Setting

3.4.2.1 Special-Status Wildlife Definition

Special-status wildlife consists of species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. Special-status wildlife is defined as meeting one or more of the following criteria:

1. Listed as threatened or endangered or candidates for future listing as threatened or endangered under the CESA or FESA;

2. Protected under other laws or regulations (e.g., Migratory Bird Treaty Act (MBTA); Bald and Golden Eagle Protection Act (BGEPA));

3. Identified as a species of special concern by the CDFW;

4. Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region, or is so designated in local or regional plans, policies, or ordinances; or

5. Fully protected species protected under California Fish and Game Code Sections 3511, 4700, 5050, and 5515; or

6. Nesting birds protected under California Fish and Game Code Sections 3503 and 3513.

As described in BLM Manual 6840 – Special Status Species Management, the BLM designates "Sensitive species" as those requiring special management considerations to promote their conservation and reduce the likelihood and need for future listing under FESA. BLM Sensitive species include all federal listed, proposed, and candidate species, federally delisted species in the 5 years following delisting, and CNPS List 1B species that occur on BLM lands. For the purposes of this analysis, all BLM Sensitive species are treated as special-status species (BLM, 2008).

3.4.2.2 Wildlife Survey Methods

An assessment of the distribution of special-status wildlife resources in the study area relied on a literature review, wildlife surveys, and coordination with appropriate permitting agencies and resource specialists. As identified in Appendix E-1, surveys for common and special-status wildlife species on the Project site and within study areas were performed between spring 2009 and spring 2013 (Panorama Environmental, Inc., 2013a). Focused wildlife surveys continued into 2013 following completion of the BRTR. Surveys were performed consistent with established federal and state survey protocols, and survey methods and surveyor qualifications were reviewed by resource agency staff, as appropriate, prior to the start of surveys (Panorama Environmental, Inc., 2013a). Survey methods for desert tortoise (*Gopherus agassizii*), Mojave fringe-toed lizard (*Uma scoparia*), golden eagle (*Aquila chrysaetos*), desert bighorn sheep (*Ovis canadensis nelsoni*), bats, and avian species are described below.

Desert Tortoise

Surveys for the desert tortoise followed two survey protocols. The 2009 desert tortoise field survey adhered to the 1992 U.S. Fish and Wildlife Service (USFWS) protocol for desert tortoises in the *Field Survey Protocol for Any Federal Action that May Occur within the Range of the Desert Tortoise* (USFWS, 1992) and the 2009 USFWS protocol, *Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS, 2009a). The survey protocol used is consistent with the current protocol for desert tortoise surveys (i.e., USFWS, 2010). Survey methods were defined through coordination with the Barstow BLM Field Office. Survey dates are provided in Appendix E-1. Additional desert tortoise surveys in 2012 considered a 220-acre area along the eastern and southern edges of the Project site that were not included earlier surveys. These surveys were conducted using the survey protocol identified within *Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS, 2010).

Mojave Fringe-toed Lizard

In advance of the focused Mojave fringe-toed lizard survey in 2009, suitable habitat areas (aeolian sand deposits) were defined using aerial photography, GIS data, and preliminary field surveys. In consultation with the BLM, it was determined that focused surveys for Mojave fringe-toed lizards should be conducted in areas of suitable habitat south of the Project ROW that cover approximately 703 acres south-southeast of the Project ROW. The BRTR (Appendix E-1) defines this area as the Mojave fringe-toed lizard study area. Survey dates and conditions are provided in Appendix E-1.

Golden Eagle and Desert Bighorn Sheep

BioResources Consultants, Inc. performed aerial surveys for golden eagle in March and May 2011, encompassing all lands within a 10-mile radius of the requested Project ROW (BioResources Consultants, Inc., 2011). Survey methods conformed to guidelines provided in the *Interim Golden Eagle Inventory and Monitoring Protocols; and other Recommendations* (Pagel, et al., 2010).

Surveys for desert bighorn sheep were conducted in the Soda Mountains in 2011 and 2012 (BioResources Consultants, Inc., 2011; Abella, 2012). Prior to the 2011 surveys, BioResources Consultants, Inc. consulted with Regina Abella, Desert Bighorn Sheep Program Coordinator for the California Department of Fish and Wildlife (CDFW), to define the survey protocol. Bighorn sheep surveys were performed concurrently with golden eagle surveys in March and May 2011, encompassing all lands within a 10-mile radius of the requested Project ROW (BioResources Consultants, Inc., 2011). CDFW additionally conducted a ground survey for bighorn sheep on April 30 and May 1, 2012, in the south Soda Mountains near Zzyzx (Abella, 2012).

Bats

Bat surveys were performed in 2012 using acoustic monitoring and roost surveys. Surveys in the Project ROW included visual surveys and acoustic monitoring at up to seven locations on the Project site and day and night roost surveys at the Blue Bell Mine complex (approximately

2 miles north of the Project site) and at culverts, overpasses, and bridges along I-15 between Rasor Road and Zzyzx Road (Panorama Environmental, Inc., 2013a; Brown-Berry Biological Consulting, 2012). Survey methods and biologist qualifications were submitted to and approved by the BLM and CDFW prior to conducting surveys.

Avian Point Count Surveys

Avian point counts were conducted in the spring and fall of 2009 (Caithness Soda Mountain, LLC, 2010d). Field survey methods were derived and adapted from the BLM's 2009 *Solar Facility Point Count Protocol* and from *Managing and Monitoring Birds Using Point Counts* (Panorama Environmental, Inc., 2013a; Ralph et al., 1995). Survey methods were approved by the Barstow BLM Field Office prior to initiating field surveys.

3.4.2.3 Special-Status Wildlife in the Action Area

The findings of the literature review and focused field surveys were summarized in the BRTR (Panorama Environmental, Inc., 2013a; Appendix E-1) and are presented in Table 3.4-2. The BLM's consultant, ESA, reviewed biological conditions of the Project site on November 15, 2012. In addition, the following Project-specific documents and other supporting resources were also reviewed to identify special-status wildlife species that may occur in the Project area:

1. Panorama Environmental, Inc., 2013a. Biological Resources Technical Report, March (see Appendix E-1);
2. Panorama Environmental, Inc., 2013b. Bighorn Sheep Survey Results and Analysis, July;
3. Panorama Environmental, Inc., 2013c. Bird and Bat Conservation Strategy, June.
4. Panorama Environmental, Inc., 2013d. Desert Tortoise Translocation Plan, June.
5. Kiva Biological Consulting, 2013a. Protocol Desert Tortoise Survey, Spring 2013, June.
6. Kiva Biological Consulting, 2013b. Protocol Burrowing Owl Survey, Spring 2013, July.
7. Caithness Soda Mountain, LLC, 2010a. Final 2009 Biological Resources Technical Report, October;
8. Caithness Soda Mountain, LLC, 2010b. Final 2009 Desert Tortoise Survey Report, October;
9. Caithness Soda Mountain, LLC, 2010c. Final 2009 Mojave Fringe Toed Lizard Survey Report, October;
10. Caithness Soda Mountain, LLC, 2010d. Final 2009 Spring and Fall Avian Survey Report, October;
11. BioResources Consultants, Inc., 2011. Golden Eagle Nest Surveys and Desert Bighorn Sheep Observations (March 21-25, 2011 and May 9-10, 2011), August; and
12. The California Natural Diversity Database (CDFW, 2013).

TABLE 3.4-2
SPECIAL-STATUS WILDLIFE KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name[a]	Scientific Name	Status State/Federal/BLM
Reptiles/Amphibians		
Desert tortoise	***Gopherus agassizii***	**ST/FT**
Mojave fringe-toed lizard	***Uma scoparia***	**CSC/__/BLM Sensitive**
Birds		
long-eared owl[b]	*Asio otus*	CSC/__/__
Western burrowing owl[b]	***Athene cunicularia hypugaea***	**CSC/BCC/BLM Sensitive**
Golden eagle	*Aquila chrysaetos*	CFP/BCC/BLM Sensitive
Mojave horned lark[b,c]	***Eremophila alpestris ammophila***	**__/__/__**
prairie falcon[b]	*Falco mexicanus*	WL/BCC/__
Loggerhead shrike[b]	***Lanius ludovicianus***	**CSC/BCC/__**
brown pelican[b]	*Pelecanus occidentalis*	CFP/delisted/__
black-tailed gnatcatcher[b]	*Polioptila melanura*	**__/__/__**
Yuma clapper rail[b]	*Rallus longirostris yumanensis*	CFP,CT/FE/__
yellow-headed blackbird[b]	*Xanthocephalus xanthocephalus*	CSC/__/__
Mammals		
Pallid bat[b]	*Antrozous pallidus*	CSC/__ /BLM Sensitive
Townsend's big-eared bat	*Corynorhinus townsendii*	CSC/__/BLM Sensitive
western mastiff bat[b]	*Eumops perotis californicus*	CSC/__/ BLM Sensitive
Desert bighorn sheep	***Ovis canadensis nelson***	**__/__/BLM Sensitive**
American badger	***Taxidea taxus***	**CSC/__/__**
Desert kit fox	***Vulpes macrotis arsipus***	**__/__/__**

NOTES:

[a] Species highlighted in **bold-face type** were identified during surveys of the study area.

[b] Species found dead or injured as reported in ongoing monitoring data from solar projects under construction in the Sonoran and Mojave Deserts

[c] The "Mojave" horned lark subspecies (*Eremophila alpestris ammophila*), which occurs on the Project site but is not a special-status wildlife species, is included in this table to distinguish on-site populations from the California horned lark (*E.a.alpestris*) subspecies, which is protected as a California Species of Special Concern. Mojave horned lark is not discussed any further in this analysis.

Status codes:

Federal

FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC = Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities

State

ST = State listed as threatened
CSC = California Species of Special Concern. Species of concern to CDFW because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction
CFP = California Fully Protected Species
WL = State watch list

Bureau of Land Management

BLM Sensitive = Species that require special management consideration to avoid potential future listing under the FESA and that have been identified in accordance with procedures set forth in BLM Manual section 6840.

SOURCE: CDFW, 2013; Panorama Environmental, Inc., 2013a

The revised BRTR (Panorama Environmental, Inc., 2013a; Appendix E-1) identifies those special-status wildlife species that were evaluated during the analysis and their likelihood to occur in the Project area and vicinity. In addition to special-status wildlife species that were directly identified in the BRTR during biological surveys, supplemental information from ongoing monitoring from solar projects under construction in the Mojave and Sonoran Deserts suggests that additional avian and bat species may be attracted to the Project site. These species may include long-eared owl (*Asio otus*), brown pelican (*Pelecanus occidentalis*), Yuma clapper rail (*Rallus longirostris yumanensis*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), and possibly others (Genesis Solar, LLC, 2013a; 2013b; 2013c). Those special-status wildlife species that were detected within the Project area or are considered likely to occur within the study area identified in Table 3.4-1 are discussed in more detail below.

Mohave Tui Chub

Natural History

The Mohave tui chub (*Gila bicolor mohavensis*) is both federally and state-listed as endangered. Mohave tui chub historically existed in the Mojave River. Today, there are only four known populations: China Lake NWS, Soda Spring, the CDFW Camp Cady Wildlife Area, and Deppe Pond. Pools must be at least 4 feet deep to resist cattails and to stabilize temperature and dissolved oxygen content. Temperature tolerance ranges from 37 to 97 degrees Fahrenheit (3 to 36 degrees Celsius). The tui chub cannot tolerate high salt content and thus there must be a flow of fresh water into the pool to counteract high evaporation rates in the desert. Insufficient water supply to existing populations is a threat to the viability of Mohave tui chub populations. Mohave tui chub feed on aquatic invertebrates. Aquatic plants are needed for attachment of eggs and to prevent anoxic conditions in the water. Vegetation (aquatic and riparian) also provides shade to protect the fish from extreme temperatures (USFWS, 2009a).

Survey Results

The population of Mohave tui chub closest to the Project area is located in Lake Tuendae and Soda Spring (also called Mojave Chub [MC] Spring or Zzyzx Spring) in the Mojave National Preserve near the Desert Studies Center at Zzyzx, approximately 4 miles east of the Project site (Panorama Environmental, Inc., 2013a; Appendix E-1). The habitat in Lake Tuendae is managed to provide adequate habitat for the Mohave tui chub through activities such as periodic dredging of sediment and cattail removal. The population of tui chub at the Desert Studies Center was 1,318 fish in Lake Tuendae in 2007, and 255 fish in Soda Spring in 2008. Lake Tuendae is filled with water pumped from the local aquifer, while Soda Spring's pool is fed by a natural spring. The aquifer at the Project site is not known to be hydrologically connected to the aquifer(s) that supplies Soda Spring and is pumped to fill Lake Tuendae. As discussed in Section 3.19, it is unknown whether the groundwater outflow from the Soda Mountain Valley contributes to groundwater flow at Soda Spring; however, the minor reduction in outflow from the Soda Mountain Valley as a result of Project groundwater is considered unlikely to have an effect on groundwater flow at Soda Spring.

Desert Tortoise

Natural History

The desert tortoise is listed as a threatened species under the FESA with critical habitat designated on February 8, 1994. It is listed as threatened under the CESA. The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (USFWS, 2011a). The desert tortoise's range, outside the listed Mojave population, extends into the Sonoran Desert, where tortoises occur in the lower Colorado River Valley, Arizona uplands, plains of Sonora, and the central Gulf Coast; the species has not been documented in northeastern Baja California (USFWS, 2011a).

Desert tortoises are well adapted to living in a highly variable and often harsh desert environment. They spend much of their lives in burrows, even during their seasons of activity, which generally coincides with the greatest annual forage availability. In late winter or early spring, they emerge from over-wintering burrows and typically remain active through fall. Activity does decrease in summer, but tortoises often emerge after summer rain storms (Henen et al., 1998; USFWS, 2011a). During activity periods, desert tortoises eat a wide variety of herbaceous vegetation, particularly grasses and the flowers of annual plants (USFWS, 2011a). During periods of inactivity, they reduce their metabolism and water loss and consume very little food. Adult desert tortoises lose water at such a slow rate that they can survive for more than a year without access to free water of any kind and can apparently tolerate large imbalances in their water and energy budgets (USFWS, 2011a).

The size of desert tortoise home ranges varies with respect to location and year (Berry, 1986) and also serves as an indicator of resource availability and opportunity for reproduction and social interactions (USFWS, 2011a). Females have long-term home ranges that may be as little or less than half that of the average male, which can range to up to 200 acres. Core areas used within tortoises' larger home ranges depend on the number of burrows used within those areas (Harless et al., 2010). Over its lifetime, each desert tortoise may use more than 1.5 square miles of habitat and may make periodic forays of more than 7 miles at a time (Berry, 1986).

Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (USFWS, 2011a). Mating occurs during spring, summer, and fall (Black, 1976; USFWS, 2011a), and the number of eggs as well as the number of clutches (set of eggs laid at a single time) that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (USFWS, 2011a). Egg-laying occurs primarily from April to July (USFWS, 2011a); the female typically lays 2 to 14 eggs (average 5 to 6 eggs) in an earthen chamber excavated near the mouth of a burrow or under a bush (USFWS, 2011a). The eggs typically hatch 90 to 120 days later, between August and October. The success rate of clutches has proven difficult to measure, but predation appears to play an important role in clutch failure (Boarman, 1993).

The majority of threats to the desert tortoise and its habitat are associated with human land uses. Many of those that formed the basis for listing the species as threatened continue to affect the tortoise today (USFWS, 2011a). Some of the continued threats to desert tortoise populations include urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens and domestic and feral dogs, unauthorized off-road vehicle activity, authorized vehicle activity, illegal collecting, mortality on paved roads, vandalism, drought, livestock grazing, feral burros, non-native plants, changes to natural fire regimes, and environmental contaminants (USFWS, 2011a).

Although a wide range of threats is known to affect desert tortoises and their habitat, very little is known about these threats' demographic impacts on tortoise populations or the relative contributions each threat makes to tortoise mortality (Boarman, 2002). Extensive research shows that all of these threats can directly kill or indirectly affect tortoises; research has also clarified many mechanisms by which these threats act on individuals. While current research results can lead to predictions about how local tortoise abundance should be affected by the presence of threats, quantitative estimates of the magnitude of these threats, or of their relative importance, have not yet been developed. Thus, the *Revised Recovery Plan* focuses on expanding the knowledge of individual threats and places emphasis on understanding their multiple and combined effects on tortoise populations (USFWS, 2011a).

The 1994 *Desert Tortoise (Mojave Population*) *Recovery Plan* identified six recovery units (Upper Virgin River, Northeastern Mojave, Eastern Mojave, Eastern Colorado, Northern Colorado, and Western Mojave) and recommended the establishment of 14 DWMAs throughout the recovery units (USFWS, 1994). Since 1994, greater insight into patterns of both ecological and genetic variation within the Mojave desert tortoise population has been gained. The 2011 *Revised Recovery Plan* combined the Eastern Colorado and Northern Colorado recovery areas into the Colorado Desert unit to reflect newly obtained information (USFWS, 2011a).

The Project is located on the eastern fringe of the Western Mojave Desert Recovery Unit. Within this area desert tortoise are found primarily on alluvial fans, bajadas, and rolling hills in saltbrush, creosote bush, and scrub steppe communities (USFWS, 1994; 2011a). The Revised Recovery Plan identified that above-ground activity in this region occurs primarily in spring, associated with winter annual production. Thus, tortoises are adapted to a regime of winter rains and rare summer storms. The extreme differences in precipitation and food availability relative to the other recovery units correspond to different foraging and activity patterns as well as to different life history characteristics. Tortoises dig deep burrows (usually located under shrubs on bajadas) for winter hibernation and summer aestivation due to generally warm summers and cold winters (USFWS, 1994). Behaviorally, western Mojave tortoises are much less active during summer than are tortoises in other recovery units (USFWS, 2011a).

Survey Results

As part of the application process, the Applicant evaluated the availability and quality of desert tortoise habitat in the Project area and desert tortoise study area based on direction provided by the BLM. As discussed, survey methods generally followed the USFWS survey protocols and included

the original 6,770-acre ROW at 100 percent survey ground coverage (30-foot-wide transects) and an additional 220-acre study area, as well as "zone of influence" surveys as described in the federal survey protocol. Surveys of potential tortoise translocation areas were ongoing at the time of the PA/EIS/EIR publication, these areas are proposed north, east and west of the Project ROW.

Protocol-level surveys of the Project ROW in 2009 and 2012 identified tortoise burrows, carcasses, and scat in the Project area and in the zone of influence (Panorama Environmental, Inc., 2013a; Appendix E-1). Additionally, an adult tortoise was identified in the study area in April 2013 by Kiva Biological Consulting (2013a) on the eastern fringe of East Array 1, along with four burrows with recent tortoise tracks. The distribution of desert tortoise sign in the desert tortoise study area is identified in Figure 3.4-1. Tortoise activity on the Project site seems to be limited to the East Array area, where sign was moderately wide-spread, particularly at the foot of the mountains to the east. Carcasses of two tortoises were detected in the North Array study area, but south of the North Array site, and tortoise sign was not detected in the South Array study area (Kiva Biological Consulting, 2013a). Habitat suitability models included in the BRTR (Appendix E-1) suggest that few desert tortoises inhabit the Project site. Based on 2013 findings, tortoises are believed to occur intermittently and in low densities in the North Array and South Array areas perhaps with moderate populations in and near the East Arrays. Based on the availability of potential habitat, the Project site provides habitat for desert tortoise within 2,450 acres of Mojave creosote bush scrub habitat, as identified in Table 3.4-3, with increasing habitat quality in areas located more distant from I-15 and adjacent to mountain slopes.

TABLE 3.4-3
NATURAL COMMUNITIES AND COVER TYPES ON THE PROJECT SITE

Vegetation Communities (Vegetation Alliance)[a]	Dominant Species	Project Site Disturbance (acres) Proposed Action
Mojave Creosote Bush Scrub	Creosote bush, White bursage	2,450
Cheesebush Scrub (Cheesebush Scrub Alliance)	Cheesebush	5.57
Developed	Unvegetated	8.27
Disturbed	N/A	0
Total Acres		**2,463.84**

NOTE:

[a] Vegetation communities are based on *A Manual of California Vegetation, Second Edition* (Sawyer, et al., 2009)

SOURCE: Sawyer et al., 2009; Panorama Environmental, Inc,. 2013

Mojave Fringe-toed Lizard

Natural History

Mojave fringe-toed lizards are widespread geographically across the Mojave and northern Colorado deserts, occurring primarily in San Bernardino, eastern Riverside, and southeastern Inyo counties. Their distribution is naturally fragmented because of their obligate habitat specificity to

loose sand, a patchy habitat type (Murphy et al., 2006). Many local populations of this species are quite small, with small patches of sand supporting small populations of lizards. This fragmented pattern of distribution leaves the species vulnerable to local extirpations from additional habitat disturbance and fragmentation (Murphy et al., 2006). The loose wind-blown sand habitat upon which the species is dependent is a fragile ecosystem requiring the protection against both direct and indirect disturbances (Griffiths et al., 2002).

Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors also affect fringe-toed lizards. Additional threats to this species include habitat loss or damage from urban development, off-highway vehicles (OHVs), and agriculture. Aside from the direct loss of land, development can also increase predators, such as the common raven, in Mojave fringe-toed lizard-occupied habitat. The BLM allows intensive OHV use over a majority of the species' range in California and Arizona. The restricted range of this species and intensive uses of habitat both contributed to its characterization as a BLM sensitive species.

The Mojave fringe-toed lizard is found in arid, sandy, sparsely vegetated habitats and is associated with creosote scrub throughout much of its range (Norris, 1958; Jennings and Hayes, 1994). This species is totally restricted to habitats of fine, loose aeolian sand, typically with sand grain size no coarser than 0.375 mm in diameter (Jennings and Hayes, 1994). They burrow in the sand for both cover from predators and protection from undesirable temperatures, though they will also seek shelter in rodent burrows. They are primarily insectivorous, but also eat plant food including leaves, seeds, and buds (USFWS, 2011b).

Mojave fringe-toed lizards normally hibernate from November to February, emerging from hibernation sites from March to April. The breeding season is April to July, and adult Mojave fringe-toed lizards reach sexual maturity two summers after hatching (Jennings and Hayes, 1994; USFWS, 2011b). From April to May, while temperatures are relatively cool, this species is active during mid-day; from May to September, they are active in mornings and late afternoon, but seek cover during the hottest parts of the day. Common predators of the Mojave fringe-toed lizard include burrowing owls, leopard lizards, badgers, loggerhead shrikes, roadrunners, various snakes, and coyotes (Jennings and Hayes, 1994).

Survey Results

As identified in the BRTR, the majority of the Project area is not suitable habitat for Mojave fringe-toed lizard due to the lack of fine, loose, windblown sand (Panorama Environmental, Inc., 2013a). Substrate in the Project ROW generally consists of rocky alluvial slopes and desert pavement separated by washes. A small area (5.82 acres) of suitable habitat was found at the southeast corner of the project area, south of the South Arrays (BRTR Figure 3.3-6, Appendix E-1). Fringe-toed lizards were observed approximately 1,000 feet from the southwest corner of the South Arrays during surveys in 2009 and they were also observed in the southern Rasor Road realignment corridor in 2012 (Panorama Environmental, Inc., 2013a). No Mojave fringe-toed lizards were identified within the array areas or proposed Rasor Road realignment corridor during surveys in 2009 and 2012. Figure 3.4-2 illustrates the distribution of Mojave fringe-toed lizards and their habitat within the study area as defined in Table 3.4-1.

Western Burrowing Owl

Natural History

Burrowing owls are unique among the North American owls in that they nest and roost in abandoned burrows, especially those created by California ground squirrels, kit fox, desert tortoise, and other wildlife. Burrowing owls have a strong affinity for previously occupied nesting and wintering habitats. They often return to burrows used in previous years, especially if they were successful at reproducing there in previous years (Gervais et al., 2008). The southern California breeding season, defined as from pair bonding to fledging, is from February to August, with a peak of breeding activity from April through July.

Burrowing owls occur across most of the California's southern deserts. As in other Mojave Desert regions, populations in San Bernardino County are widely scattered with overall low population numbers (Gervais et al., 2008). Burrowing owls tend to be opportunistic feeders. Their diet consists primarily of large arthropods, mainly including beetles and grasshoppers. Small mammals, especially mice and voles (Microtus, Peromyscus, and Mus spp.), are also important food items for this species. Other prey animals include reptiles and amphibians, young cottontail rabbits, bats, and birds, such as sparrows and horned larks. Consumption of insects increases during the breeding season.

Threats to burrowing owls identified in the WEMO and by CDFW include: urban development and pest eradication that decrease prey and burrow availability, degrade habitat quality, and may increase mortality risk; direct mortality from humans (including vehicle collision), pesticides, habitat degradation, destruction, and loss, and predators; and subtle adverse effects to suitable habitat result from grazing, invasion of non-native plants, alteration of flood patterns through flood control, and erosion (BLM, 2005; Gervais et al., 2008).

Survey Results

The Project area provides suitable nesting, foraging, and wintering habitat for burrowing owls. Burrowing owls and burrowing owl sign, including burrows, pellets, feathers, and whitewash, were observed in multiple locations within the Project ROW during fall botanical surveys and desert tortoise surveys in 2012 (Figure 3.4-3) (Panorama Environmental, Inc., 2013a). The Project site appeared to support between 9 and 24 burrowing owls during surveys in late 2012, with 24 burrows showing signs of recent use by burrowing owls. Burrowing owls were observed using 8 of the 24 active burrows, and 1 additional owl was also observed in the Project ROW (Panorama Environmental, Inc., 2013a). Phase 3 burrowing owl surveys in 2013 detected owl sign at 50 burrows (Kiva Biological Consulting, 2013b). The entire Project site may be used by burrowing owls for foraging during migration or as resident breeding and foraging habitat.

Long-Eared Owl

Natural History

The long-eared owl, a CDFW Species of Special Concern, inhabits a wide variety of habitats within its range, and is known to occur throughout most of California. This species typically nests

in old corvid and raptor nests in woodlands adjacent to shrubland or grassland habitats. Long-eared owls feed almost exclusively on rodents, but are also known to prey upon birds (CDFG, 2008a).

Survey Results

Suitable foraging habitat and limited nesting sites are present within, and adjacent to the project site, but this species is most likely to occur as a migrant. Long-eared owl was not identified during focused surveys for the Project, but has been reported as deceased or injured in ongoing monitoring data from solar projects under construction in the California desert, including in San Bernardino County.

Brown Pelican

Natural History

The brown pelican, a California Fully Protected species, typically is restricted to coastline habitats within its California range, although the species is common at the Salton Sea. The species is known to occur as a resident and a migrant within California. Migrating populations are known to travel between breeding grounds in the Gulf of California and habitats as far northward as British Columbia. Brown pelicans feed almost exclusively on small fish, but are also known to scavenge on occasion (Cornell Lab of Ornithology, 2013).

Survey Results

The brown pelican is expected to occur in the vicinity of the Project study area only as a migrant. The species was not identified during the analysis for the Project, but has been reported as deceased or injured in ongoing monitoring data from solar projects under construction in the California desert, including in San Bernardino County.

Yuma Clapper Rail

Natural History

The Yuma clapper rail is a California Fully Protected, California Threatened, and Federally Endangered species. Within California, the Yuma clapper rail is restricted to the lower Colorado River and Salton Sea areas. The Yuma clapper rail nests within freshwater marsh habitats, and feeds primarily crayfish and other freshwater invertebrates (Dudek and ICF International, 2012). The breeding range of the Yuma clapper rail has been restricted due to a regional loss of wetland habitats in recent decades.

Survey Results

The Yuma clapper rail is expected to occur in the vicinity of the Project study area only as a migrant. The Yuma clapper rail was not identified during the analysis for the Project, but has been reported as deceased or injured in ongoing monitoring data from solar projects under construction in the California desert, including in San Bernardino County.

Yellow-Headed Blackbird

Natural History

The yellow-headed blackbird, a CDFW Species of Special Concern, inhabits marsh habitat with tall emergent vegetation. Regionally, the breeding distribution of the species is limited to the lower Colorado River and Salton Sea areas. The breeding range of the species has been restricted due to a regional loss of wetland habitats in recent decades (CDFG, 2008b).

Within the vicinity of the Project study area, the species is expected to occur only as a migrant. The species was not identified during the analysis for the Project, but has been reported as deceased or injured in ongoing monitoring data from solar projects under construction in the California desert, including in San Bernardino County.

Golden Eagle

Natural History

The golden eagle (*Aquila chrysaetos*) is a USFWS Bird of Conservation Concern, BLM Sensitive Species, and a state fully protected species. This species is an uncommon permanent resident and migrant throughout much of California and is somewhat common in southern California. They breed from late January through August with peak activity March through July (Kochert et al., 2002). Migratory patterns are usually fairly local in California where adults are relatively sedentary, but dispersing juveniles sometimes migrate south in the fall. This species is generally considered to be more common in southern California than in the northern part of the state (Tesky, 2004).

Habitats for this species typically include rolling foothills, mountain areas, and deserts. Golden eagles need open terrain for hunting and prefer grasslands, deserts, savanna, and early successional stages of forest and shrub habitats. Golden eagles primarily prey on lagomorphs and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al., 2002). This species prefers to nest in rugged, open habitats with canyons and escarpments, with overhanging ledges and cliffs and large trees used as cover.

The status of golden eagle populations in the United States is not well known, although there are indications that populations may be in decline (USFWS, 2009b; Kochert et al., 2002). Accidental death from collision with man-made structures, electrocution, gunshot, and poisoning are the leading causes of mortality for this species, and loss and degradation of habitat from agriculture, development, and wildfire continues to put pressure on golden eagle populations (Kochert et al., 2002; USFWS, 2009b).

Absent interference from humans, golden eagle breeding density is determined by either prey density or nest site availability, depending upon which is more limiting (USFWS, 2009b). A compilation in Kochert et al. (2002) of breeding season home ranges from several western United States studies showed an average home range of 20 to 33 square kilometers (7.7 to 12.7 square miles) that ranged from 1.9 to 83.3 square kilometers (0.7 to 32.2 square miles). Golden eagles in the Mojave Desert are believed to have somewhat larger ranges due to low prey densities. In 2009, the USFWS published a Final Eagle Permit Rule authorizing limited issuance of permits to

take bald and golden eagles where the take is associated with but not the purpose of an otherwise lawful activity (74 Fed. Reg. 46836, September 11, 2009).

Survey Results

No golden eagles were identified near the Project ROW during aerial and ground surveys in 2009 and 2012; however, in 2011 surveyors identified an active eagle nest on the south face of Cave Mountain approximately 8 miles southwest of Project site (Figure 3.4-4) (Panorama Environmental, Inc., 2013a). A pair of eagles was observed incubating an unknown number of eggs, and a second alternate nest was detected directly below the active nest. Biologists observed an additional sub-adult golden eagle interacting with the adult male, perching and soaring around the summit of Cave Mountain.

The Project site is located within an open valley that provides no suitable nesting habitat for golden eagles; however, Mojave creosote bush scrub vegetation community on the site provides foraging opportunities for this species. Golden eagles may forage up to 10 miles from a nest in xeric habitat, hunting black-tailed jackrabbits, ground squirrels, woodrats, or other small animals that occur in desert communities. They may also scavenge for carrion along I-15 (Panorama Environmental, Inc., 2013a).

Loggerhead Shrike

Natural History

Loggerhead shrikes are uncommon residents throughout most of the southern portion of their range, including southern California. In southern California they are generally much more common in interior desert regions than along the coast (Humple, 2008). Loggerhead shrikes initiate their breeding season in February and may continue with raising a second brood as late as July; they often re-nest if their first nest fails or to raise a second brood (Yosef, 1996).

This species can be found within lowland, open habitat types, including creosote scrub and other desert habitats, sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. In general, loggerhead shrikes prey upon large insects, small birds, amphibians, reptiles, and small rodents over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding (Yosef, 1996). Loss of habitat to agriculture, development, and invasive species is a major threat; this species (Humple, 2008).

Survey Results

Suitable nesting and foraging habitat for loggerhead shrike exists on and adjacent to the Project area. Seven shrikes were observed during spring and fall avian surveys in 2009, indicating that loggerhead shrike may use the Project area year-round.

Other Avian Species

Avian point count surveys in 2009 detected 629 birds comprising 22 species during the spring count surveys and 210 birds comprising 23 species during the fall count (Caithness Soda

Mountain, LLC, 2010d). The potential and documented occurrence of other special-status birds on the Project site is discussed in the BRTR (Appendix E-1). Foraging habitat is available for other bird species on the Project site, with nesting opportunities provided for several common ground- and shrub-nesting bird species.

Pallid Bat

Natural History

The pallid bat (*Antrozous pallidus*) is a California species of concern and a BLM Sensitive species. Pallid bats inhabit low elevation (less than 6,000 feet) rocky, arid deserts and canyon lands, and shrub/steppe grasslands, but also occur in higher-elevation coniferous forests, greater than 7,000 feet in elevation. This species is most abundant in xeric landscapes including the Great Basin, Sonoran, and Mojave Deserts (WBWG, 2009). Pallid bats are known from Cuba, Mexico, and throughout the southwestern and western United States. Population trends are not well known, but there are indications of decline.

Pallid bats roost alone, in small groups (two to 20 bats), or gregariously (hundreds of individuals). Roosts are apparently selected on the basis of temperature and proximity to foraging habitat (Brown-Berry Biological Consulting, 2012). Roosts may include crevices in rock outcrops, cliffs, and boulders, caves, mines, and historic buildings (WBWG, 2009), as well as burrows within creosote bush scrub habitat (Brown-Berry Biological Consulting, 2012).

Survey Results

Suitable roosting habitat off the Project site at Blue Bell Mine, Otto Mountain Mine (or Aga Prospect Mine) north of Baker, within 10 miles of the Project site (Brown-Berry Biological Consulting, 2012). No acoustic signals of pallid bats were detected during surveys of the Project area in 2012 (Brown-Berry Biological Consulting, 2012). It is difficult to estimate the relative abundance of this species in the Project area by acoustic methods (Brown-Berry Biological Consulting, 2012). Therefore, it is assumed that pallid bats would use the Project site for foraging, as it is within the foraging range of the bats observed at Otto Mountain Mine.

Townsend's Big-eared Bat

Natural History

The Townsend's big-eared bat is present in the Pacific region west of the Rockies, from southern British Columbia to central Mexico, and east into the Great Plains (WBWB, 2005). It has been reported in a wide variety of habitat types ranging from sea level to over 9,000 feet above mean sea level (amsl). Townsend's big-eared bats have a wide range of habitat associations, including forests, deserts, prairies, riparian communities, active agricultural lands and coastal areas. Abandoned mines and caves are an important component of this species' roosting habitat in desert regions.

Survey Results

Townsend's big-eared bats were not detected during acoustic surveys of the Project area. Townsend's big-eared bats and/or their guano were observed approximately 2 miles from the

Project area in several of the Blue Bell Mine features and the Otto Mountain Mine in 2012 (Brown-Berry Biological Consulting, 2012). While no bats were observed, it is assumed that bats roosting in the Blue Bell Mine could forage over the Project site because it provides suitable foraging habitat and is within the foraging range of bats at Blue Bell Mine and Otto Mountain Mine. Townsend's bats are known to travel up to 5 miles for forage. Suitable roosting habitat is not present within the Project area, as there is no cave-like roosting habitat.

Desert Bighorn Sheep

Natural History

The desert bighorn sheep are a BLM California Sensitive Species, a State Fully Protected Species, and a State Game Species. The desert bighorn sheep (also called Nelson's bighorn sheep) includes those from the Transverse Ranges through most of the desert mountain ranges of California and adjacent Nevada and northern Arizona to Utah. Essential habitat for bighorn sheep includes steep, rocky slopes of desert mountains, termed "escape terrain." Their agility on steep rocky terrain is an adaptation used to escape predators such as coyotes, eagles, and cougars (Wehausen, 2006). Surface water is another element of desert bighorn habitat considered essential to population health. Male and female bighorn sheep inhabiting desert ecosystems can survive without consuming surface water (Wehausen, 2006), and males appear to drink infrequently in many situations; however, there are no known large populations of bighorn sheep in the desert region that lack access to surface water. In the spring, when annual plants are available, bighorn tend to disperse downhill to bajadas and alluvial fans to forage. Desert bighorn sheep have a long lambing season that can begin in December and end in June in the Mojave Desert, and a small percentage of births commonly occur in summer as well (Wehausen, 2006).

Over the past 140 years, bighorn sheep have suffered considerable population declines throughout their range, and metapopulations have been fragmented by roads and other barriers with a resulting decline in genetic diversity (Bleich et al., 1996). Disease, sometimes brought about by contacts with domestic sheep, drought, and predation, interacting with other anthropogenic factors, may also have contributed to declines in bighorn sheep populations (BLM, 2005). Loss of surface water sources may also diminish the viability of existing populations (BLM, 2005).

Bighorn sheep populations in the desert are generally found above the desert floor, near or in steep, rocky mountainous areas and often on slopes of 10 percent or greater (Bleich et al., 1997). Open mountainous terrain with good visibility is critical because bighorn primarily rely on their sense of sight to detect and evade predators (USWFS, 2000). Bighorn sheep also use habitat on alluvial fans and washes emanating from mountains as well as the flat terrain between mountain ranges. The use of alluvial fans provides access to high-quality forage. Flat terrain also provides temporary access to resources such as water, forage, and/or lambing habitat in neighboring areas. During the lambing season, ewes and their lambs are typically found in steeper, more secure habitat, while rams inhabit less steep or rugged terrain. Sheep are also frequently observed within 0.50 mile of slopes greater than 20 percent (i.e., mountainous terrain) during feeding or movement, with tapering use at greater distances from slopes (USFWS, 2000). Consistent with the USFWS (2000) approach, the adjusted footprint of the Proposed Action relative to the 20 percent slope contour line is depicted in Figure 3.4-5.

Alluvial fans and washes are important late winter, spring, and summer habitat after rain events, particularly for lactating ewes during the lambing season, because they provide high quality forage (USFWS, 2000). These areas act as a vital nutritional source that becomes even more important in summer and at times when forage is otherwise limited (USFWS, 2000). While sheep do not use these areas on a continuous year-round basis; they are, at times, critically important to bighorn sheep in terms of high quality forage (i.e., newly emergent or actively growing vegetation that is high in moisture content, digestibility, and crude protein) present on such sites, which can have profound effects on body condition and, hence, reproductive success the following year (Bleich, 2012). The availability of high quality forage in low-lying areas during the spring growing season can have important implications for reproductive biology and recruitment rates of bighorn sheep in desert environments (Bleich, 2012).

Sixteen populations of bighorn sheep are known to have existed within the WEMO planning area, as defined by mountain range complexes, or portions of one of these ranges. Five of these areas no longer contain populations, three have been reintroduced, and two have been augmented with sheep from another population (Bleich et al., 1990). Three bighorn metapopulations now are recognized in the WEMO planning area, with geographic boundaries formed by I-15 and I-40: the south, central, and north Mojave Desert metapopulations (Wehausen, 2006).

Survey Results

The population of bighorn sheep inhabiting the south Soda Mountains (south of I-15) is recognized as a subpopulation within the Central Mojave metapopulation fragment (Bleich, 2012). Surveys of this population by CDFW in April 2012 identified 47 sheep, with an estimated population between 51 and 100 individuals (Abella, 2012). The group nearest to the Project site, comprised of three females and three lambs, was approximately 1.5 miles east of the East Arrays. Most of the population resided on the east side of the south Soda Mountains, in close proximity to Soda Spring and limestone outcrops, which provide suitable lamb-rearing habitat (Abella, 2012).

During surveys in March 2011, which avoided the south Soda Mountains at the request of CDFW, BioResource Consultants detected two sheep in the Cave Mountains, south of I-15 and approximately 8 miles southwest of the Project site (BioResources Consultants, 2011; Panorama Environmental, Inc., 2013a). In fall 2012, five sheep and sheep bedding sites were detected on the west side of the south Soda Mountains, approximately 0.5 mile east of the Project ROW (Panorama Environmental, Inc., 2013a; Appendix E, Figure 3.3-10). Three adult ewes also were observed foraging within and adjacent to the north ends of the proposed East Array south of I-15 (Panorama Environmental, Inc., 2013b). These recent observations and anecdotal reports of sheep presence in the Soda Mountain valley cited in the BRTR (Panorama Environmental, Inc., 2013a; Appendix E) indicate that bighorn sheep intermittently forage and shelter in portions of the Project ROW located south of I-15.

Bleich (2012) considers that the north Soda Mountains are not known to be inhabited by bighorn sheep on a permanent basis, although observations are occasionally reported. This finding is supported by aerial surveys, as bighorn sheep were not observed in the north Soda Mountains during 2009 and 2011 surveys (BioResources Consultants, Inc., 2011; Panorama Environmental,

Inc., 2013a). In citing a 1970 report, Bleich states that the absence of permanent occupancy could be a function of the extremely dry conditions in that portion of the range and the absence of one or more permanent sources of water (Bleich, 2012).

CDFW identifies the range of the Soda Mountain population of bighorn sheep to include the Soda Mountains both north and south of the Project site, as well as the entire Soda Mountain valley. Although the north Soda Mountains are not currently known to support a permanent population of bighorn sheep, that geographic area is recognized for its importance in: 1) either maintaining existing levels of connectivity between the south Soda Mountains and the Avawatz Mountains to the north, or 2) its potential role in reestablishing connectivity between the south Soda Mountains and the Avawatz Range (Bleich, 2012). There are limited opportunities for sheep to cross I-15 between the north and south Soda Mountains.

Four box culverts and two bridges were identified in the BRTR, that occasionally may be used by sheep (Panorama Environmental, Inc, 2013a; Epps et al., 2013).

There is no known existing migration or connectivity between populations of bighorn sheep in the south Soda Mountains and the Avawatz Mountains, approximately 15 miles north of the Project area. CDFW and the Society for the Conservation of Bighorn Sheep have expressed interest in reconnecting the population in the south Soda Mountains with the population in the Avawatz Mountains. This potential connection to the Avawatz Mountains would improve genetic diversity by connecting the central metapopulation with the northern metapopulation.

The Desert Bighorn Sheep Management Plan, currently being drafted by CDFW, identifies the Soda Mountain area as a location where connectivity across I-15 could be reestablished due to the presence of oversized culverts (essentially underpasses) and bighorn sheep in the area (Panorama Environmental, Inc., 2012). The critical linkage map in the DRECP reflects this goal of reestablishing connectivity across I-15 in areas where it could potentially exist in the future. The only portions of the Project ROW where bighorn sheep would be able to safely cross I-15 are at highway underpasses or overpasses.

American Badger

Natural History

American badgers were once fairly widespread throughout open grassland habitats of California. Badgers are an uncommon permanent resident with a wide distribution across California, except from the North Coast area. Badgers inhabit burrows and often predate and forage on other small mammal burrows as evidenced by claw marks along the edges of existing burrows. This species is most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers generally are associated with treeless regions, prairies, parklands, and cold desert areas (Zeiner et al., 1990). Badgers feed mainly on various species of small mammals and capture some of their prey above ground, foraging on birds, eggs, reptiles, invertebrates, and carrion.

Survey Results

During surveys in fall, one burrow was identified with signs of badger digging (Panorama Environmental, Inc., 2013a). The undeveloped 2,455.57-acre portion of the Project site provides suitable denning and foraging habitat.

Desert Kit Fox

Natural History

Desert kit fox are an uncommon to rare permanent resident of arid regions of the southern portion of California. Kit fox occur in annual grasslands, or grassy open, arid stages of vegetation dominated by scattered herbaceous species. Kit fox occur in association with their prey base which is primarily cottontail rabbits, ground squirrels, kangaroo rats, and various species of insects, lizards, or birds (Zeiner et al., 1990). Protection provided by kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Title 14 California Code of Regulations Section 460 identifies the desert kit fox as non-game species that may not be hunted or captured.

Survey Results

Extensive kit fox sign was documented on the Project site during surveys conducted in 2009 and 2012. At least 57 recently active or occasionally used kit fox dens were identified in the Project ROW in fall 2012 (Panorama Environmental, Inc., 2013a; Appendix E-1, Figure 3.3-9). These included 2 active dens, 26 inactive occasional use dens, 14 possibly active dens, 10 dens that were potentially used by kit fox, and 5 inactive natal dens. Numerous desert kit fox scat also were observed; mostly in association with dens. The relatively flat substrate throughout much of the Project site consists of friable sand and gravel soils that are conducive to kit fox den creation. Prey species, such as black-tailed jackrabbits and ground squirrels, also are present on-site.

3.4.3 Applicable Laws, Regulations, Plans, and Standards

3.4.3.1 Federal

National Environmental Policy Act

NEPA (42 USC §4321 et seq.) declares a continuing federal policy that directs “a systematic, interdisciplinary approach” to planning and decision-making and requires environmental impact statements for “major Federal actions significantly affecting the quality of the human environment.” Implementing regulations by the CEQ (40 CFR Parts 1500-1508) require federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws or agency practice into the NEPA process (40 CFR 1500.2). The NEPA process should therefore be seen as an overall framework for the environmental evaluation of federal actions. The BLM is the Lead Agency under NEPA for the Project.

Lacey Act, as amended

The Lacey Act (16 USC §§3371-3378) protects plants and wildlife by creating civil and criminal penalties for a wide variety of violations including illegal take, possession, transport, or sale of protected species.

Federal Endangered Species Act

The FESA (16 USC §1531 et seq.) designates threatened and endangered species, both animal and plant species, and provides measures for their protection and recovery. "Take" of listed wildlife and listed plant species is prohibited without a federal permit (16 USC §1539). Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 USC §1532(19)). "Harm" includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife, including, breeding, spawning, rearing, migrating, feeding or sheltering (50 CFR 222.102). Activities that damage the habitat of (i.e., harm) listed wildlife species require approval from the USFWS for terrestrial species. The FESA also generally requires designation of critical habitat for listed species (16 USC §1533(a)(3)(A)(i)) and requires federal agencies to ensure that a proposed action is not likely to result in the destruction or adverse modification of critical habitat (16 USC §1536(a)(2)). FESA Section 7 and Section 10 provide two pathways for obtaining authority to take listed species.

Federal agencies such as the BLM are required by the FESA to ensure that any action they authorize, fund, or carry out, including energy developments, is not likely to jeopardize the continued existence of any federally threatened or endangered species or destroy or adversely modify designated critical habitat (16 USC §1536(a)(2)). In a Section 7 consultation, the lead agency (e.g., the BLM) prepares a biological assessment (BA) that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat (16 USC §1536(c)). USFWS' "Guidance for Preparing a Biological Assessment" recommends that the BA identify any conservation measures that will be implemented to avoid, reduce, or eliminate adverse effects or that would benefit the protected species or critical habitat (USFWS, 2012). If the action would adversely affect the species, the USFWS has 135 days to deliver a biological opinion (BO) to the agency (50 CFR 402.14(e)). The BO will opine whether the project is likely to jeopardize the continued existence of the species or result in adverse modification of critical habitat.

If a "no-jeopardy" opinion is provided by the USFWS, the action agency may proceed with the action as proposed. When the USFWS determines that a proposed action may jeopardize the continued existence of a listed species in the wild or result in adverse modification to designated critical habitat, USFWS guidance indicates that "the (USFWS), with the assistance of the Federal agency and/or applicant, [shall] develop Reasonable and Prudent Alternatives [RPAs] that may be undertaken to avoid the likelihood of jeopardy or adverse modification. While these RPAs must avoid jeopardy or adverse modification, they may result in adverse effects to or take of listed species. If take will occur from the implementation of an RPA, an incidental take statement must be developed to exempt such take from section 9 prohibitions." (USFWS, 2013) Thus, in a BO that results in a jeopardy or adverse modification conclusion, the USFWS may develop mandatory reasonable and prudent alternatives to the proposed action (50 CFR 402.14(g)(5) and 402.14(h)(3)).

BLM Sensitive Species

BLM Sensitive species include species listed or proposed for listing under the FESA and species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the FESA. All federal candidate species, proposed species, and delisted species in the 5 years following delisting are conserved as BLM sensitive species (BLM, 2008). Various offices of the BLM maintain a list of special-status plant and wildlife species that are to be considered as part of the management activities carried out by the BLM on the lands that it administers.

CDCA Plan

The CDCA Plan (BLM, 1999) covers approximately 25 million acres of land in southern and southeastern California, with approximately 10 million acres being administered by the BLM. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development and protection of the resources and public lands within the CDCA and is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. See Section 3.9 for more information.

WEMO Plan

The West Mojave Plan (WEMO Plan) includes a 9,357,929-acre planning area in an area located to the north of the Los Angeles metropolitan area. As an amendment to the CDCA Plan, the WEMO Plan is the largest habitat conservation plan (HCP) and federal land use plan amendment ever put in place in the United States. The plan was implemented by the BLM, San Bernardino County, and the City of Barstow and applies to both public and private lands that include 3,263,874 acres of BLM-administered public lands, 3,029,230 acres of private lands, and 102,168 acres of lands administered by the State of California. The WEMO Plan is consistent with the integrated natural resource management plans that have been adopted for 2,667,445 acres of military lands, and with programs being implemented on the 292,689 acres of lands within Joshua Tree National Park. Other lands within the planning area include lands under the management of the Bureau of Indian Affairs and Department of Defense (BLM, County of San Bernardino, and City of Barstow, 2005). The Project is located on the eastern fringe of the WEMO planning area.

The WEMO Plan provides a comprehensive strategy to conserve and protect the desert tortoise, Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part. The plan additionally offers a streamlined process for public agencies and private entities to meet their federal and state endangered species act requirements.

The WEMO Plan has both positive and negative effects on target plant and wildlife species. Key focal areas of the plan include protecting large blocks of high quality habitat, avoiding human impacts on conservation areas, accommodating particularly vulnerable species, and preserving biodiversity. As a major component of the plan, large areas of relatively low conservation value lands have become available for development, recreation, and resource extraction. The WEMO Plan determined that projects that include solar development will have adverse impacts on the remaining

protected areas and associated sensitive species. All practicable means to avoid or minimize environmental harm suggested by the WEMO Plan have been adopted in this PA/EIS/EIR. These include "take" avoidance measures presented in Section 2.2.4 of the Final EIR/EIS for the WEMO Plan related to desert tortoise, Mohave ground squirrel, bats, mammals, raptors, reptiles and plants.

The Bald and Golden Eagle Protection Act

The BGEPA prohibits take of eagles, their nests, or their eggs without a permit (16 USC §668 et seq.). Under the BGEPA, "take" is defined as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb (16 USC §668c); USFWS regulations promulgated pursuant to BGEPA add "to destroy" to this definition (50 CFR 22.3). Under these regulations, "disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (50 CFR 22.3). On September 11, 2009, the USFWS set in place rules (50 CFR parts 13 and 22) establishing two new permit types: (1) take of bald and golden eagles that is associated with, but is not the purpose of, the activity (50 CFR 22.26); and (2) purposeful take of eagle nests that pose a threat to human or eagle safety (50 CFR 22.27). Specifically, the regulations authorize intentional take of inactive eagle nests where: necessary to alleviate a safety emergency (applies to active nests too); necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure; or the activity, or mitigation for the activity, will provide a clear and substantial benefit to eagles (50 CFR 22.27).

Pursuant to BLM Instructional Memorandum (IM) 2010-156, the BLM must incorporate consideration of golden eagles and their habitat into the NEPA analysis for all renewable energy projects. IM 2010-156 requires the following condition of approval for all renewable energy authorizations/actions occurring within the range of bald and golden eagles:

> *Bald and Golden Eagle Protection Act (Eagle Act) Compliance Stipulation.* Bald and/or golden eagles may now or hereafter be found to utilize the project area. The BLM will not issue a notice to proceed for any project that is likely to result in take of bald eagles and/or golden eagles until the applicant completes its obligation under applicable requirements of the Eagle Act, including completion of any required procedure for coordination with the U.S. Fish and Wildlife Service (Service) or any required permit. The BLM hereby notifies the applicant that compliance with the Eagle Act is a dynamic and adaptable process which may require the applicant to conduct further analysis and mitigation following assessment of operational impacts. Any additional analysis or mitigation required to comply with the Eagle Act will be developed with the Service and coordinated with the BLM. Bald and Golden Eagle Protection Act (Eagle Act) Compliance Stipulation.

Migratory Bird Treaty Act

The MBTA (16 USC §§703-712) implements international treaties between the U.S. and other nations that protect migratory birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC §§661-666) applies whenever the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified by any federal department or agency, or by any public or private agency under federal permit or license. The federal agency is required to consult with the USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. Under the Act, the term "wildlife" includes both animals and plants (16 USC §666b). Provisions of the Act are implemented through the NEPA process and Section 404 permit process.

3.4.3.2 State

California Endangered Species Act

The CESA (Fish and Game Code §2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species that are listed or candidates for listing by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects are not listed by the state. Take is defined similarly to but more narrowly than FESA and is prohibited for listed species. Take authorization for listed and candidate species may be obtained by the project applicant from CDFW under CESA Sections 2081 or 2080.1 if incidental to otherwise lawful development projects. In this case, private developers consult with CDFW to develop a set of measures and standards for managing the listed or candidate species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

Other Sections of the California Fish and Game Code

Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. CDFW cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock. Furthermore, it is the responsibility of the CDFW to maintain viable populations of all native species. To that end, the CDFW has designated certain vertebrate species as Species of Special Concern because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

3.4.3.3 Local

San Bernardino County General Plan

The following policies identified in the Conservation (CO) and Circulation and Infrastructure (CI) elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

Policy CO 2.1. The County will coordinate with state and federal agencies and departments to ensure that their programs to preserve rare and endangered species and protect areas of special habitat value, as well as conserve populations and habitats of commonly occurring species, are reflected in reviews and approvals of development programs.

Policy CO 2.4. All discretionary approvals requiring mitigation measures for impacts to biological resources will include the condition that the mitigation measures be monitored and modified, if necessary, unless a finding is made that such monitoring is not feasible.

Policy D/CI 2.1. Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.

3.4.4 Analytical Methodology

This analysis of potential impacts of the Proposed Action and alternatives to wildlife resources relies on a literature review, biological reconnaissance survey, focused wildlife surveys, and coordination with appropriate permitting agencies including the USFWS and CDFW. A literature review was conducted to determine the federal and state-listed endangered, threatened, and special-status wildlife species that have the potential to occur within the Project vicinity. Literature related to BLM Sensitive species in the California Desert District Office area (CDCA Plan, WEMO Plan) was reviewed. The literature review also included a search of the CNDDB Electronic Inventory for the nine USGS 7.5' topographic quadrangles that surround the Project. As discussed in Section 3.4.2, focused wildlife surveys were conducted for desert tortoise, burrowing owl, golden eagle (nest survey), and avian species (i.e., avian point counts).

Additional focused technical documents referenced in the 2013 BRTR (Panorama Environmental, Inc., 2013a) include golden eagle nest surveys and bighorn sheep observations in 2011 (BioResource Consultants, Inc., 2011); a 2012 bat habitat assessment (Brown-Berry Biological Consulting, 2012); and a 2012 protocol-level desert tortoise survey (Kiva, 2013a).

This section analyzes potential direct, indirect, and cumulative impacts to wildlife resources from construction, operation and maintenance, and decommissioning of the Proposed Action and alternatives, as well as the implementation of mitigation measures that would avoid or minimize such impacts. Wildlife impact analyses typically characterize effects as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state within a relatively brief time frame (e.g., within one season of initial disturbance). In desert ecosystems, the definition of permanent impacts must reflect the slow recovery rates of vegetation communities. For the purposes of this analysis and following CDFW guidance, all ground disturbance activity is considered a permanent impact due to the long time period for natural revegetation to occur in the desert.

The analysis and environmental protection measures presented in this PA/EIS/EIR were reviewed to provide consistency with approved mitigation measures and/or prescriptions that were presented in the WEMO Plan/FEIS relating to desert tortoise, desert restoration, public education,

and limitations on cumulative new surface disturbance (BLM, 2005). All practicable measures to avoid or minimize environmental harm by the plan have been adopted.

3.4.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects to wildlife resources. The impact analysis assumes that the applicable APMs would be implemented as part of the Project.

APM 44: The Applicant will implement a Worker Environmental Awareness Program (WEAP) to educate workers about the environmental issues associated with the Project and the mitigation measures that will be implemented at the site, including nest awareness and non-disturbance exclusion zones.

APM 45: Burrowing owls occupying burrows on site will be passively relocated outside the nesting season or after a qualified biologist determines that the burrow does not contain eggs or chicks and after consultation with CDFW. Prior to construction and passive relocation, artificial burrows will be installed in areas that would not be disturbed during construction at a ratio of 5:1 for each burrow that will be destroyed by project construction. Passive relocation will be conducted prior to construction and according to the Burrowing Owl Consortium Guidelines (CBOC, 1993).

APM 46: Pre-construction clearance surveys to identify active bird nests will be conducted within 2 weeks of ground disturbance or vegetation removal in all active work areas during the breeding season (February 1 through August 31). The work area will need to be resurveyed following periods of inactivity of 2 weeks or more. Active nests will be avoided using non-disturbance buffer zones as shown below.

Avian Awareness and Baseline Non-Disturbance Buffer Zones

Type	Starting Distance of Awareness or Non-Disturbance Exclusion Zones	Implementation Notes
Passerines	300 feet from active nest	A qualified biologist may reduce or increase the buffer distance if there is sufficient evidence based on species, habitat, and other factors, that SMS activity would not impact nesting activity. Buffers would be maintained until a qualified biologist has determined that the nest is no longer active.
Raptors	500 feet from active nest	
Golden Eagles	1 mile and line of sight from active nest	
Burrowing Owls[1]	250 feet from active burrows during nesting season (February 1 through August 31)	
	160 feet from active burrows during the wintering period (September 1 through January 31)	

NOTE:
[1] Described in CBOC, 1993

APM 47: Monitoring of any active nests within or adjacent to the work areas will be conducted until nestlings have fledged and dispersed. Ongoing breeding-season monitoring of work areas will be conducted throughout the duration of construction.

Nest monitoring results will be recorded in a Nest Check Form. Typically a nest check will have a minimum duration of 30 minutes, but may be longer or shorter, or more frequent

than one check per day, as determined by the Designated Biologist based on the type of construction activity (duration, equipment being used, potential for construction-related disturbance) and other factors related to assessment of nest disturbance (weather variations, pair behavior, nest stage, nest type, species, etc.). The Designated Biologist will record the construction activity occurring at the time of the nest check and note any work exclusion buffer in effect at the time of the nest check. Non-Project activities in the area should also be recorded (e.g., adjacent construction sites, roads, commercial/industrial activities, recreational use, etc.). The Designated Biologist will record any sign of disturbance to the active nest, including but not limited to parental alarm calls, agitated behavior, distraction displays, nest fleeing and returning, chicks falling out of the nest or chicks or eggs being predated as a result of parental abandonment of the nest.

Should the Designated Biologist determine project activities are causing or contributing to nest disturbance that might lead to nest failure, the Designated Biologist will coordinate with the Construction Manager to limit the duration or location of work, and/or set other limits related to use of project vehicles, and/or heavy equipment. Nest locations, Project activities in the vicinity of nests, and any adjustments to buffer areas will be described and reported in regular monitoring and compliance reports.

APM 48: Preconstruction surveys for burrows containing suitable bat roosting habitat that could be used as individual bat roosts will be conducted in all Project work areas.

APM 49: The connection from the substation to the transmission line will be designed to meet the most recent APLIC guidelines to the extent practicable.

APM 50: The Applicant will implement an Integrated Weed Management Plan to control weed infestations and the spread of noxious weeds on the Project site. This is described in more detail in Section 3.3.5.

APM 51: Roads, power lines, fences, and other infrastructure associated with the Project will be minimized to reduce habitat loss. Fencing will use wildlife compatible design standards.

APM 52: Collector lines will be placed underground to reduce avian collisions.

APM 53: After Project construction, areas of temporary disturbance will be closed and the restoration measures in the Vegetation Resource Management Plan will be implemented.

APM 54: Federal and state measures for handling toxic substances will be followed to minimize danger from spills to water and wildlife resources. Facility operators shall maintain Hazardous Materials Spill Kits on site. Personnel will be trained to use the Hazardous Materials Spill Kits.

APM 55: The Applicant will clear vegetation outside of the bird breeding season to the maximum extent practicable. Preconstruction avian clearance surveys will be conducted by a qualified biologist for vegetation clearing during the bird breeding season (February 1 through August 31). If a nest(s) is identified in the preconstruction avian clearance surveys, a qualified monitor will be on site during vegetation removal in order to enforce non-disturbance buffers and stop activities as necessary should construction disturb nesting activity.

APM 56: Trash will be disposed of in covered containers and regularly removed from the site.

APM 57: Surveys for burrowing owl will be conducted in suitable burrowing owl habitat prior to construction and if construction is suspended for 2 weeks or more. The survey protocol will follow the Burrowing Owl Consortium Guidelines (CBOC, 1993). If active burrows are found they will be avoided using non-disturbance buffer zones, as described in the table included in Wildlife-3. Passive relocation would be used as described above once the burrow is determined to be inactive.

APM 58: A qualified biologist will conduct a golden eagle clearance survey for a 4-mile area surrounding the project. Golden eagle clearance surveys will be conducted annually for each year of construction during the golden eagle nesting season. If active nests are found in the survey area, SMS will coordinate with BLM, USFWS, and CDFW to ensure that construction does not result in disturbance of the golden eagles.

APM 59: Evaporation ponds will have 3:1 sloping sides to discourage wading birds from utilizing the ponds. A wire grid with visual deterrents, such as plastic colored ribbons, will be implemented to discourage birds and bats from landing on the ponds. The evaporation pond will be monitored for bird fatalities. Netting or other appropriate BMPs will be applied at the direction of the Designated Biologist and as approved by BLM, CDFW, and USFWS (as appropriate).

APM 60: The Project will remove and dispose of road kill near the Project site to avoid attracting raptors and other scavengers to the site, and will regularly remove vegetation around larger facilities (such as the substation) to reduce raptor foraging.

APM 61: The Project will minimize the use of lighting that could attract migrating birds and bats (that could feed on concentrations of insects at lights). Lighting will be kept to the minimum level necessary for safety and security. High intensity, steady burning, bright lights such as sodium vapor or spotlights will not be used on project facilities.

APM 62: Project personnel and visitors will be instructed to drive at low speeds (<15 mph) and be alert for wildlife, especially in low-visibility conditions

APM 63: Decommissioning methods will minimize new site disturbance and removal of native vegetation.

APM 64: Foundations will be removed to a minimum of 3 feet below surrounding grade during decommissioning, and covered with soil to allow adequate root penetration for native plants. Petroleum product leaks and chemical releases shall be remediated prior to completion of decommissioning.

APM 65: Fencing will be removed at the completion of decommissioning.

APM 66: Desert tortoise exclusion fencing will be installed at the perimeter of project construction areas (i.e., solar array areas, project buildings, substation/switchyard, earthen berms, and along the edge of access roads and collector line corridors). The fence locations will be determined during final design and will enclose areas of project activity. The fenceline and a 30-foot-wide buffer will be surveyed for desert tortoise before construction of the fence and according to USFWS protocol. Tortoises found in the fenceline survey area or spotted within 50 meters of the fenceline survey area will be:

a. Assigned a USFWS identification number.

b. Given a health assessment

c. Fitted with a transmitter. Tortoises that are too small to accept a transmitter (i.e., no transmitter is available that is 10 percent or less of the tortoise's body weight) will be treated as a translocatee and held in situ.

d. Moved into habitat adjacent to and outside the fenceline. The tortoise will be moved into an empty burrow if clearance of the fence area takes place outside the tortoise active season (i.e., from November to March and from June to August).

Any of the moved tortoises that return to the project site before completion of fence construction will be treated as a translocatee. Desert tortoises remaining outside the fenceline prior to completion of the fence will be deemed residents. The transmitter will be removed from the resident tortoise, and no further action will be taken for the resident tortoises. USFWS procedures will be followed to clear and handle the desert tortoises.

APM 67: The project site preconstruction clearance survey will be conducted during the desert tortoise active season (April through May and September through October) unless otherwise agreed to by USFWS and CDFW. The survey will be conducted according to USFWS protocol and preferably during early morning hours to increase the chance the juvenile tortoises are found, per the Guidelines. Any tortoise scat will be collected on each pass of a transect, per the Guidelines. USFWS procedures will be followed to clear and handle the desert tortoise.

APM 68: The linear facilities preconstruction clearance survey(s) will be conducted at any time throughout the year. Linear facilities for this project will include the buried collector lines between arrays and connecting to the substation. Located desert tortoises will be undisturbed and allowed to clear the site without assistance or interference. Tortoises will be moved if necessary to reduce the potential for harm from construction activities, but will not be moved more than 500 meters in such a scenario. USFWS procedures will be followed to clear and handle the desert tortoise.

APM 69: Data will be collected during clearance surveys as described in this section. The same data will be collected again on tortoises held in the interim in situ on the day that the tortoise is translocated from the project site. The data will include:

a. Date
b. Time
c. Temperature (°C)
d. Project Name
e. Site type (project/recipient/control)
f. Landowner (BLM)
g. Permit/BO #
h. Coverage #
i. Field crew vendor
j. Surveyor (first and last name)
k. ID#
l. MCL (mm)
m. Sex
n. UTM (Easting)
o. UTM (Northing
p. Location (e.g., burrow)
q. Transmitter manufacturer
r. Transmitter serial #
s. Transmitter frequency
t. Transmitter install date
u. Battery life (months)
v. Status (alive/dead/lost)

APM 70: Following installation of the desert tortoise exclusion fencing, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 72 hours between March 15 and October 31 and within 7 days between November 1

and March 14 of observing damage. Inspections of permanent site fencing shall occur while desert tortoise fencing is in place.

APM 71: No construction, operations, or decommissioning activities shall occur in unfenced areas without an approved desert tortoise biologist present. These activities include the construction phase (construction, revegetation), decommissioning phase, and maintenance activities during the operations phase that require new surface disturbance. An adequate number of trained and experienced monitors must be present during all construction and decommissioning activities in unfenced areas, depending on the various construction tasks, locations, and season. A biologist shall be on site from March 15 through October 31 (active season) during ground-disturbing activities in areas outside the exclusion fencing, and shall be on-call from November 1 to March 14 (inactive season). The biologist shall check all construction areas immediately before construction activities begin. The biologist shall inspect construction pipes, culverts, or similar structures: (a) with a diameter greater than 3 inches, (b) stored for one or more nights, (c) less than 8 inches aboveground, and (d) within desert tortoise habitat (i.e., outside the permanently fenced area), before the materials are moved, buried, or capped. Alternatively, such materials may be capped before storing outside the fenced area or placing on pipe racks.

APM 72: A Raven Monitoring and Control Plan shall be prepared consistent with the most current USFWS-approved raven management guidelines. The purpose of the plan is to avoid any project-related increases in raven numbers during construction, operation, and decommissioning. The Raven Monitoring and Control Plan shall be submitted to BLM and CDFW for approval at least 30 days prior to the start of construction.

APM 73: Compensatory habitat mitigation shall be provided at a 1:1 ratio for impacts to suitable desert tortoise habitat during construction. A habitat compensation plan will be prepared to the approval of CDFW, USFWS, and BLM.

APM 74: No pets shall be allowed on site prior to or during construction, except kit fox scat detection dogs (with CDFW approval) used for preconstruction surveys.

APM 75: Two water sources will be created to encourage bighorn sheep migration to the north of I-15. The water source location(s) shall be determined through coordination with CDFW and BLM. The water sources shall be maintained throughout the life of the Project.

3.4.6 Direct and Indirect Effects

3.4.6.1 Alternative A: Proposed Action

Construction

Construction would result in direct and indirect impacts to wildlife and wildlife habitats. Potential impacts to terrestrial wildlife associated with the Proposed Action include: 1) direct loss of certain terrestrial wildlife habitats due to construction activities within the proposed array fields and associated access roads; 2) temporary, indirect loss of wildlife habitat use or displacement of wildlife use during construction; 3) vehicle-related mortality; and 4) habitat fragmentation. The timing, duration, and magnitude of potential impacts to wildlife and wildlife habitats depend on a number of factors including the type and duration of disturbance, the species of wildlife present, time of year, and the implementation of recommended and required mitigation measures.

General Wildlife Impacts

Habitat Loss for Common Wildlife. Implementation of the Proposed Action would directly disturb or remove 2,450 acres of Mojave creosote bush scrub and 5.57 acres of cheesebush scrub. Disturbance to wildlife habitat would occur as a result of ground surface grading and excavation, tree and shrub removal, and/or scraping of road surfaces that disturbs surface and subsurface soils. Each of these activities could effectively remove and/or degrade existing habitat, thereby reducing habitat availability to local wildlife populations.

Ground disturbance associated with construction activities would cause the associated mortality of some small amphibian, reptile, or mammal species that have limited home ranges or low mobility. Although there is no way to accurately quantify the effects of habitat disturbance on wildlife usage, the impact is likely to be moderate in the short term with effects lasting until decommissioning. Most of the affected wildlife species would be common and are widely distributed throughout the Project area. The temporary and permanent habitat loss and impacts to individuals during habitat removal would have a negligible impact on populations of these species throughout the region.

Noise Impacts. Construction activities associated with the Proposed Action would result in a temporary, although relatively long-term (24- to 30-month) increase in ambient noise. Animals rely on hearing to avoid predators, obtain food, and communicate. Excessive construction noise could interfere with normal wildlife communication, potentially affecting contact between mated birds, warning and distress calls that signify predators and other threats, and feeding behavior and protection of young. High noise levels also may render an otherwise suitable nesting area unsuitable or result in abandonment of active nesting sites.

Mohave Tui Chub

The aquifer at the Project site is not known to be hydrologically connected to the aquifer that supplies Soda Spring and is pumped to fill Lake Tuendae. As discussed in Section 3.19, *Water Resources*, the groundwater monitoring plan required in Mitigation Measure 3.19-4 provides quarterly testing and reporting of water drawdown in several observation wells that will be constructed on the Project site. The plan also includes monitoring and quarterly reporting of groundwater elevations in Soda Spring and Lake Tuendae. Based on monitoring findings, if the Project is shown to cause a significant decline in the groundwater aquifer that could alter water availability within tui chub habitat, an evaluation will be conducted to determine the cause and the ground water model revised. No impacts are anticipated to Mohave tui chub, as groundwater monitoring that is proposed in Mitigation Measure 3.19-4 and APMs 14 through 18 would verify that the Project would not detrimentally affect flows at Soda Spring.

Desert Tortoise

Direct Impacts. The discussion below is consistent with supporting information for the forthcoming Biological Opinion, which is currently being prepared by the USFWS to address potential effects to desert tortoise. Evidence from focused surveys between 2009 and 2012 suggests that few desert tortoise occupy the Project site, though the East Array area shows greater use by tortoises. One tortoise was identified just east of East Array 1 in April 2013, and another

observed in 2001 along Opah Ditch Mine Road within the Project ROW (Panorama Environmental, Inc., 2013a). Little desert tortoise sign was detected in the North Array and South Array portions of the Project site, though carcasses were noted in the former area. It is likely that one or more desert tortoise would be detected during pre-construction/clearance surveys or related work. Nonetheless, construction, operation and maintenance, and decommissioning of the Proposed Action could have direct and/or indirect impacts on the species.

Potential direct impacts to the desert tortoise from the Proposed Action include:

1. Permanent loss of 2,455.57 acres of low- to moderate-quality occupied, and intermittently occupied habitat; designated critical habitat does not occur on the Project site;
2. Fragmentation or disturbance of adjacent habitat;
3. Disruption of connectivity corridors that join areas north and south of I-15;
4. Mortality to individuals during construction activities, such as clearing, grading and trenching, as well as from vehicle and equipment use and access;
5. Illegal collection of desert tortoise or vandalism;
6. Disruption of desert tortoise behavior during construction and operation of facilities;
7. Disturbance of desert tortoise caused by noise or vibration;
8. Encounters with workers' or visitors' pets, particularly if pets are allowed off-leash; and
9. Effects from translocation efforts, such as injury or death from improper capture or handling techniques, as well as inherent risks and uncertainties in moving desert tortoises.

The Project would cause increased risk to desert tortoise from roads and traffic. Vehicle traffic would increase as a result of construction and improvement of access roads, thereby increasing the risk of injuring or killing desert tortoise. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest though tortoises on dirt roads may also be affected. Census data indicate that desert tortoise numbers decline as vehicle use increases and that tortoise sign increases with increased distance from roads. Additional impacts may occur from unauthorized use of the access roads in the Project area, including unauthorized trail creation.

Indirect Impacts. Indirect impacts to desert tortoise from the proposed action could include:

1. Increased predation from ravens,[1] coyotes, pet or feral dogs,[2] and/or other predators;

[1] Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman, 2002). Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (USFWS, 2011a) and one of many anthropogenic contributors to desert tortoise population declines.

[2] Feral dogs have emerged as major predators of the tortoise. Dogs may range several miles into the desert and have been found digging up and killing desert tortoises (USFWS, 1994). Dogs brought to the project site with visitors may harass, injure or kill desert tortoises, particularly if allowed off-leash to roam freely in occupied desert tortoise habitat.

2. Small mammal, fox, coyote, rabbit, lizard, snake, and tortoise road kills along I-15 provide an additional attractant and subsidy for opportunistic predators and scavengers such as ravens. Road kills may increase, at least temporarily during construction, as a result of Project-related traffic, further exacerbating raven and other predator attractions and increasing desert tortoise predation levels;

3. Disruptions to connectivity as noted above under direct impacts;

4. Impacts from the construction-related introduction or spread of invasive plants that out compete native plants, and that can form dense monospecific stands of unsuitable habitat for the desert tortoise;[3]

5. Accidental wildfires could result during Project construction and decommissioning (e.g., from vehicle or equipment sparks) and operation (e.g., from vehicles or welding sparks); however, the potential for this to occur is low due to the relatively small length of transmission lines proposed as part of the Project; and

6. Potential deposition of sediment loads as a result of construction-related sediment mobilization during heavy rain events and flooding downstream could impact existing desert tortoise burrows outside of the Project site.

The Proposed Action would cause increased risk to the desert tortoise from other indirect impacts**.** Construction, operation, and maintenance of the Project also could attract tortoises to the construction area by application of water to control dust, potentially placing them at higher risk of injury or mortality. Construction and operation and maintenance activities of the Project could attract tortoise predators such as the common raven, kit fox, and coyote to the Project area due to the presence of water and food sources such as trash and road kill. Project structures could also provide new nesting and perching sites for ravens such as new perimeter fencing. Common ravens were observed on the Project site during surveys in 2009 and are a year-round resident species in the regional area (Panorama Environmental, Inc., 2013a). Development of new elevated perching sites as a result of Project construction could increase raven numbers locally, including the probability that young ravens remain in the area after maturing, which, in turn, could result in increased predation on desert tortoise in the Project area.

Impacts of Relocation. The capture, handling, and relocation of desert tortoises from the Project site after the installation of exclusion fencing could result in harassment and possibly death or injury. Tortoises may die or become injured by capture and relocation if these methods are performed improperly, particularly during extreme temperatures, or if such handling causes them to void their bladders. Averill-Murray (2002) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates than those that did not void. Further, if multiple desert tortoises are handled by biologists without the use of appropriate protective measures, pathogens may be spread among both resident and translocated tortoises. For those tortoise near but not on the Project site, removal of habitat, especially the removal of known cover sites and burrows within a tortoise's home range, or segregating individuals from portions

[3] Project-related spread of noxious weeds could reduce the quality of tortoise habitat, for example by replacing native plants that provide tortoise forage, increase the danger of wildfires, restrict tortoise movements, and/or produce toxic effects to tortoises if consumed (potential impacts on vegetation resources are analyzed in Section 3.4).

of their home range with a fence would likely result in displacement stress that could result in loss of health, increased exposure, increased risk of predation, increased intra-species competition, and possibly death. Tortoises moved outside their home ranges would likely attempt to return to the area from which they were moved, making it difficult to isolate them from the potential adverse effects associated with Project construction.

The risks and uncertainties of translocation to the desert tortoise are well recognized in the desert tortoise scientific community. The USFWS Desert Tortoise Recovery Office (DTRO) Science Advisory Committee (SAC) has made the following observation regarding desert tortoise translocations (USFWS, 2009c):

> (C)onsensus (if not unanimity) exists among the SAC and other meeting participants that translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations should be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental condition.

The Applicant has prepared a draft Desert Tortoise Translocation Plan (DTTP) that estimates the number of tortoises that may be present on the Project site and describes the methods to be used to translocate tortoise to avoid and minimize the potential for "take" as defined under FESA and CESA (Panorama Environmental, Inc., 2013d). Mitigation Measure 3.4-2b includes requirements for the final DTTP, which would be reviewed and approved by CDFW, USFWS, and BLM and would be implemented to move any tortoises detected during clearance surveys. When approved, the final DTTP would: 1) analyze whether relocation or translocation is an appropriate action; 2) identify and prioritize potentially suitable locations for translocation; 3) evaluate desert tortoise handling and transport considerations (including temperature) and animal health considerations; 4) describe translocation scheduling, site preparation and management; and 5) specify monitoring and reporting activities for evaluating success of translocation.

Movement and Habitat Connectivity of Desert Tortoise and Other Wildlife. Connectivity refers to the degree to which organisms can move among habitat patches and populations. Individuals must be able to move between patches to meet their resource needs, while populations must be connected to allow for dispersion, gene flow, and re-colonization. Surveys conducted by the Applicant and field observations by agency staff indicate that the culverts and associated major washes on and near the Project site are used by a variety of wildlife, including deer, coyote, roadrunner, black-tailed jackrabbit, gray fox, Gambel's quail, woodrats, and other small rodents, and potentially desert tortoise. These culverts are important passageways for wildlife to safely traverse the I-15 freeway corridor.

Desert tortoises are known to use low-quality intermountain habitat, such as that present on the Project site, as dispersal routes that over time provide connectivity between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray, 2005). A survey of various desert tortoise habitat connectivity studies included in the BRTR evaluates barriers to tortoise movement in the regional Project area (Appendix E-1, pg., 3-31, et seq.). Though the Baker Sink located east of the Project site presents a large physiographic barrier that restricts desert tortoise movement, recent observations of tortoise sign north of the town of Baker suggest that the Baker Sink may not be an impassable barrier to movement. The BRTR describes that the Baker Sink becomes narrow (0.1 to 0.2 miles wide), just north of the Project site and could plausibly be traversed by tortoises at times even in the absence of available cover (Panorama Environmental, Inc., 2013a). The modeled low habitat suitability and genetic study suggest that there would be a low frequency of tortoise and movement across Baker Sink and the area is unlikely to be a primary corridor for tortoise population connectivity (Panorama Environmental, Inc., 2013a).

Desert Tortoise Impact Summary. The implementation of mitigation measures identified in section 3.4.7 would avoid, minimize, and compensate for direct and indirect impacts to desert tortoise during construction. Protective measures for desert tortoise include Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction); 3.4-1c (WEAP); 3.4-1d (speed limits); 3.4-2a (specific desert tortoise protection measures); 3.4-2b (DTTP); 3.4-2c (verification of the desert tortoise compliance program); and 3.4-2d (compensatory mitigation for habitat losses).

Mojave Fringe-toed Lizard

Mojave fringe-toed lizards were identified during surveys of the Project ROW; however, habitat for this species occurs in association with sand dune and sand sheet habitat located approximately 1,000 feet south of South Array 3. This species does not occur on the Project site and no direct effects are anticipated to Mojave fringe-toed lizards.

Indirect Project impacts include the potential for increased predation on lizards by raptors, ravens, and other birds such as loggerhead shrike if populations were inadvertently elevated due to the Proposed Action; the potential introduction and spread of exotic vegetation species into off-site dune areas; and hazards associated with the spraying of herbicides and dust suppression chemicals within occupied habitat.

Indirect effects to Mojave fringe-toed lizard would be minimized through implementation of APM 50 (IWMP) and of Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction); and 3.4-1c (WEAP).

Western Burrowing Owl

Up to 48 recently active owl burrows and 9 individual individual owls were observed in the burrowing owl study area, generally concentrated within the study area for the South Arrays (Figure 3.4-3) (Panorama Environmental, Inc., 2013a; Kiva, 2013b). It is anticipated that all identified active burrows on the Project site would be removed during Project construction as

described in APM 45. Burrowing owl nesting may occur in association with abandoned kit fox burrows throughout the Project site, and the entire site is considered to provide suitable burrowing owl foraging habitat.

In addition to direct impacts on individual owls and burrows, burrowing owl survival can be indirectly affected by human disturbance and foraging habitat loss even when impacts to individual owls and burrows are avoided. A significant impact to the burrowing owl may occur if there is:

1. Disturbance or harassment within approximately 160 feet of occupied burrows;
2. Destruction of burrows and burrow entrances; and/or
3. Degradation of foraging habitat within approximately 1,960 feet (600 m) of occupied burrows that are not directly impacted by construction (CDFG, 2012).

Direct and indirect effects to burrowing owl would be minimized through implementation of APMs 45 through 48, 50, and 57, and Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist); 3.4-1b (biological monitoring during construction); 3.4-1c (WEAP); and 3.4-1f (burrowing owl survey requirements and protection measures).

Golden Eagle

The Project site is located within an open valley and there is no suitable nesting habitat for golden eagles within the Project area. The Project area provides suitable foraging habitat and could be used by golden eagles nesting outside of the Project area, as the home range of the species in southern California is estimated to be approximately 36 square miles (Panorama Environmental, Inc., 2013a).

A golden eagle nest was observed 7.75 miles from the Project site during surveys and a possible nest may exist in the Mojave National Preserve approximately 4 miles east of the Project site (Panorama Environmental, Inc., 2013c). Noise, night lighting, and visual impacts during Project construction would not impact golden eagle nesting behavior at these known and suspected nests due to their distance from the Project site.

Loss of golden eagle foraging habitat would occur as a result of Project construction. The Project site provides golden eagle foraging opportunities and its development would permanently eliminate 2,445.57 acres of foraging lands.

As described under APMs 46, 47, and 58, a golden eagle clearance surveys would identify active nests within 4 miles of the Project site, active nests would be avoided using non-disturbance buffer zones, and nest monitoring would determine work limitations to avoid disturbance. Implementation of the proposed IWMP (APM 50 and Mitigation Measure 3.3-2) would reduce indirect impacts to golden eagles from the loss of foraging habitat due to the establishment of invasive plants. Implementation of Mitigation Measure 3.4-1g (Bird and Bat Conservation Strategy) would reduce Project-related direct impacts to this species.

Special-Status and Migratory Birds

Loggerhead shrike (*Lanius ludovicianus*) are year-round residents that may nest throughout the Project site. Mojave creosote bush scrub habitat that dominates the Project site provides nesting, foraging, and perching habitat for shrikes. In addition, other birds that are protected by the MBTA may nest on the Project site. The Project's direct construction-related impacts to loggerhead shrike and other on-site nesting birds would be avoided and minimized by implementation of APMs 44, 46, 47, and 48 and Mitigation Measures 3.4-1a (monitoring by a designated biologist); 3.4-1b (biological monitoring during construction); 3.4-1c (WEAP); 3.4-1g (Bird and Bat Conservation Strategy); and 3.4-4 (preconstruction nesting bird surveys and avoidance measures).

Direct and indirect impacts could occur to special-status and migratory birds as soon as PV panels are installed on site because PV panels are thought to attract birds that are not typically expected to be present in a desert environment. Initial construction monitoring for other commercial-scale solar projects in the California desert has begun documenting on-site mortality and injury to a variety of birds whose presence had not been anticipated, including fully protected, special-status, and other avian species protected under the Migratory Bird Treaty Act.

Solar PV panels are both reflective and have a strong polarization signature – elements thought to mimic water or suitable related habitat. As a result, some have theorized that PV panels can attract species that mistake the panels for bodies of water (see, e.g., Randall et al., 2010); however, this speculation is not supported by empirical research. The phenomenon sometimes colloquially is referred to as the "lake effect." Some postulate that this phenomenon could be attracting birds to solar sites and thereby exposing them to greater risk of impacts, such as potential collision with Project infrastructure. Another possible effect is that birds may be stranded within site fencing once they land due to lack of sufficient space to complete a running lead relative to the prevailing wind direction that is required by some large birds (such as brown pelicans) to gain flight. Other forms of distress may also be occurring.

The causes of unexpected avian injuries and fatalities at commercial-scale solar projects are under investigation by the USFWS, CDFW, and others. The BLM anticipates that the results of these agencies' investigation will inform adaptive management techniques as more is learned. However, as yet, no formal studies have been conducted at commercial-scale solar projects that establish a causal link between such projects and the types of avian mortality and injury being documented on solar project sites in the California desert.

Much of what is known about avian collision risk with solar PV facilities is based on preliminary avian monitoring data from the Desert Sunlight and Genesis projects that remain under investigation by the USFWS.[4] The numbers and specific species of birds that may be affected by the phenomenon cannot be quantified or predicted with certainty because the impacts of commercial-scale solar projects have not yet been studied in a scientifically robust manner.

[4] Weekly and annual biological monitoring reports for the Desert Sunlight project are available at: http://www.firstsolar.com/en/Projects/Desert-Sunlight-Solar-Farm. Monthly compliance reports, which include biological monitoring information, are available at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=09-AFC-08C.

Several special-status birds (including the brown pelican, yellow-headed blackbird, and federally and state-endangered Yuma clapper rail) and some common bird species protected under the Migratory Bird Treaty Act have been found dead at large-scale solar project sites as reported in monitoring data for projects now under construction (CEC, 2013; Genesis Solar, LLC, 2013a; 2013b; 2013c; Ironwood Consulting, Inc., 2012; 2013a; 2013b).

For the Project, there would be a potential for direct impacts to special-status birds to occur during the construction phase that would continue through the operation and maintenance phase until solar panels and other infrastructure are removed during decommissioning. During all Project phases when panels are installed, the Project would produce reflected light and polarized light pollution that some currently think could attracts birds to the Project site. In some cases, the impacts of such attraction could be negligible, for example, resulting in the use of a small amount of energy to investigate the absence of on-site habitat; however, in other cases, based on preliminary avian monitoring being conducted at the Desert Sunlight and Genesis project sites, bird attraction to the Project site could result in injury or fatality.

The Avian Monitoring Program required by Mitigation Measure 3.4-1h is proposed to characterize the avian collision risk associated with the Project. It is intended to supplement and be implemented in concert with the Bird and Bat Conservation Strategy required by Mitigation Measure 3.4-1g. Mitigation Measure 3.4-1h would provide avian injury and mortality monitoring and an adaptive management strategy that provides coordination with the CDFW, USFWS, and the BLM. While this measure would help describe the extent of the magnitude of the potential impact to common and special-status avian species, it would not fully reduce the impacts of proposed facilities to individual birds because avian collision risks would remain.

Desert Bighorn Sheep

Focused CDFW surveys in 2013 identified a bighorn sheep group in the south Soda Mountains, approximately 1.5 miles east of the Project site (Abella, 2012). Noise from Project construction could discourage adults and lambs from using nearby foraging habitat within Soda Mountain valley. Noise impact studies on bighorn sheep have not identified numerical noise impact thresholds, though Weisenberger et al. (1996) found behavioral and physiological responses to aircraft over-flights (92 to 112 dBA).

As described in Section 3.11, *Noise*, based on an average construction noise of 85 dBA at 50 feet from the noise center and noise attenuation of 6 dBA per doubling of distance, normal construction noise would attenuate to about 60 dBA at approximately 800 feet (0.15 mile) from the noise center. Construction noise also would be buffered by the presence of the Soda Mountains. No substantial impact to desert bighorn sheep is expected on occasions when construction activities occur near the Project boundary and resultant noise levels exceed 60 dBA surrounding the Project site. Project-related effects to bighorn sheep would occur primarily as a result of barriers to sheep movement beginning with installation of construction fencing. Fencing impacts are discussed below.

Desert Kit Fox and American Badger

Project construction has the potential to injure or kill American badgers and desert kit foxes by crushing them with construction equipment or by crushing den entrances, which would prevent them from escaping. Following the erection of perimeter fencing around the solar plant site and subsequent wildlife clearance surveys, the perimeter fence would limit badger and kit fox access to the main Project site, and consequently would reduce the likelihood of injury on the site during construction. There also is a risk that individual animals inadvertently could be injured or killed by vehicles on access roads.

The Project's direct and indirect construction-related impacts to kit fox and American badger would be avoided and minimized by implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist); 3.4-1b (biological monitoring during construction); and 3.4-1c (WEAP).

Bats

The Project site is within the foraging range of pallid bats observed at Otto Mountain Mine and Townsend's bats observed at Blue Bell Mine and Otto Mountain Mine. Thus, foraging special-status bats may occur on the Project site. Brown-Berry Biological Consulting (2012) additionally noted that pallid bats could roost within burrows within creosote bush scrub habitat; however, evidence of such bat presence was not detected on-site. All habitats within the Project ROW are suitable for bat foraging.

Potential indirect effects on bats could occur if construction activities disrupted nighttime foraging activities. Direct and indirect construction-related impacts to special-status bats would be avoided and minimized by implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), 3.4-1c (WEAP), 3.4-1e (lighting specifications to minimizes bird and bat impacts), and 3.4-1g (Bird and Bat Conservation Strategy).

Operation and Maintenance

Special-Status Amphibians and Reptiles

The presence of employees on the Project site during operation and maintenance could introduce trash into the area and attract common ravens, coyotes, or other desert tortoise predators. Similarly, the creation of 4 acres of evaporation ponds could attract predatory species, even if they cannot gain access to the ponds. Increased predation upon desert tortoises would be an indirect Project impact. Similar impacts could occur to Mojave fringe-toed lizard.

Lighting for the Project could disturb special-status wildlife species in adjacent areas. Night lighting would be provided at the site entrance, operation and maintenance buildings, substation, and switchyard. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required; and all lights would be hooded and directed downward to minimize backscatter and off-site light.

Migratory Birds

Operation and maintenance activities are unlikely to result in direct or indirect impacts to nesting bird species protected under the MBTA and the Fish and Game Code. Operation and maintenance activities could result in active nests being removed from existing facilities if conflicts are identified (e.g., nest locations create a hazardous situation). There is a low chance that nesting bird disturbance could occur in association with the removal or management of vegetation within the Project site, or due to foot or vehicle traffic associated with operation and maintenance activities. Additionally, operational night lighting has the potential to affect nesting bird species. These impacts would be minimized by implementation of Mitigation Measures 3.4-1g (Bird and Bat Conservation Strategy) and 3.4-5b (Operation and Maintenance Education Program).

The same potential effects related to the presence of PV panels on the site described for construction, above, could occur during operation and maintenance. The Avian Monitoring Program required by Mitigation Measure 3.4-1h is proposed to characterize the avian collision risk associated with the Project. It is intended to supplement and be implemented in concert with the Bird and Bat Conservation Strategy required by Mitigation Measure 3.4-1g. Mitigation Measure 3.4-1h would provide avian injury and mortality monitoring and an adaptive management strategy that provides coordination with the CDFW, USFWS, and the BLM. While this measure would help describe the extent of the magnitude of the potential impact to common and special-status avian species, it would not fully reduce the impacts of proposed facilities to individual birds because avian mortality risks would remain.

Golden Eagle

Operation and maintenance would not result in direct or indirect impacts to golden eagle nest sites because the nearest potential nest site is approximately 4 miles from the Project site, and the nearest confirmed active nest is 7.75 miles from the site. Foraging activity has not been observed on the site and findings suggest that the site experiences infrequent foraging use by eagles. The potential golden eagle foraging habitat that would be disturbed or removed by development of the Project is neither unique nor limiting on the landscape, and does not represent a known prey concentration. Comparable or better foraging opportunities are expected to be available within the surrounding areas. For these reasons, development and operation of the Project is not expected to disturb the foraging of any eagle pairs located within 10 miles of the Project site.

Because the collection lines would be installed underground and the Project does not propose any overhead transmission facilities, the Project would not pose an electrocution or collision hazard to golden eagles.

Western Burrowing Owl

Operation and maintenance actions have a low likelihood of affecting burrowing owls because activities would largely occur within the developed solar arrays and developed areas. These activities would not remove burrowing owl breeding or foraging habitat, and would occur only on approved Project access roads and within permanent work areas. This impact would be minimized by implementation of Mitigation Measures 3.4-1g (Bird and Bat Conservation Strategy) and 3.4-5b (Operation and Maintenance Education Program).

Other Potential Bird Impacts

Electrocution. Large raptors such as the golden eagle, red-tailed hawk, and great-horned owl can be electrocuted by transmission lines when a bird's wings simultaneously contact two conductors of different phases, or a conductor and a ground. This happens most frequently when a bird attempts to perch or take off from a structure with insufficient clearance between these elements (APLIC, 2006; 2012). Within the Project site, 34.5 kV underground collection lines would connect the solar panel arrays to the substation and would not pose an electrocution risk to raptors. As described in APM 49, the connection from the substation to the existing 500 kV transmission line would be designed to meet the most recent APLIC guidelines to the extent practicable.

Brine Ponds. Brine ponds would be constructed to dispose of RO reject water through evaporation. The proposed brine ponds would contain contaminants including TDS or selenium, and could pose threats to wildlife by creating a new water source that would: (1) attract ravens to the site, potentially increasing predation rates on juvenile desert tortoise in adjacent habitat; or (2) attract waterfowl, shorebirds, and other resident or migratory birds that could attempt to drink, forage or nest at the ponds. These direct and indirect operational impacts would be avoided and minimized by implementation of Mitigation Measures 3.4-1g (Bird and Bat Conservation Strategy) and 3.4-5b (Operation and Maintenance Education Program).

Lighting and Nocturnal Collisions. Operation of the Proposed Action would require on-site nighttime lighting for safety and security, Night lighting close to the ground at the Project site could alter the behavior of common wildlife that occur adjacent to the site, or migratory birds that move through the region. Because of the minimal other manmade sources of light in this remote area, when viewed from nearby off-site locations, the overall change in ambient lighting conditions at the Project site may be substantial. Mitigation Measure 3.18-1 in Section 3.18, *Visual Resources*, requires lighting controls that would reduce the amount of light visible from off-site locations and would reduce but not completely avoid the potential effects of nighttime lighting on wildlife. Mitigation Measure 3.4-1e supplements these requirements to provide further protections for birds and bats from the effects of on-site lighting.

Avian Attraction and Collision Risk. During all Project phases when panels are installed the Project would produce reflected light and polarized light pollution that some currently think could attract special status and other birds to the Project site. Potential direct and indirect impacts to special-status and migratory birds resulting from attraction to on-site PV panels and collision-related risks would continue during facility operation and maintenance.

The Avian Monitoring Program required by Mitigation Measure 3.4-1h and Bird and Bat Conservation Strategy required by Mitigation Measure 3.4-1g would reduce potential Project impacts to common and special-status avian species; however, they would not completely eliminate the risk to birds.

American Badger and Desert Kit Fox

A low risk remains during operation and maintenance that badgers or foxes inadvertently could be injured or killed by vehicles on access roads. This impact would be minimized by implementation of Mitigation Measure 3.4-5b (Operation and Maintenance Education Program).

Desert Bighorn Sheep

Once the Project is constructed, Project-related noise and human activity are expected to be low, and associated primarily with panel washing and other maintenance activities. The Project site is located in an area that receives minimal public use and the Project site has been buffered from the 20 percent slope as shown in Figure 3.4-5. Day-to-day activities on the Project site are not expected to be substantially greater as a result of vehicular use and human activity than what already occurs in the area.

Epps et al. (2013) and Bleich (2012) discuss that development within the Soda Mountain valley and the presence of Project facilities within occupied bighorn sheep habitat have the potential to adversely affect regional sheep movement opportunities and locally reduce the availability of high quality seasonal forage areas within Soda Mountain valley. These authors describe the geographic importance of the Project site as an intermountain movement corridor for sheep between the north and south Soda Mountains, and as a source of nutritional benefits derived from seasonal forage availability.

The bighorn sheep habitat suitability report included in the BRTR prepared for the Project by Panorama Environmental, Inc. (Appendix E-1, pg. 197 et seq.) did not identify bighorn sheep linkage corridors within the Project ROW; however, it acknowledged that the model incorrectly underestimated suitable habitat in the south Soda Mountains where sheep are known to occur. Evidence suggests that sheep could intermittently use low-lying portions of the Project site during short-lived regional movements (Panorama Environmental, Inc., 2013a; see also, Bleich, 2012). Since initially proposed, the Proposed Action has been modified to facilitate west-to-east water transport and wildlife access between the solar arrays. Even though wildlife movement opportunities would be available within the Project ROW and potentially under I-15, the presence of Project facilities may deter wary bighorn sheep from venturing through the site, or from using culverts in its vicinity. While it may occur infrequently, the north-south movement of bighorn sheep across I-15 in the study area is important to maintaining the sheep metapopulation within the Soda Mountains. Thus, the Project may have a significant effect on bighorn sheep movement across I-15 and within the Project site, though other movement opportunities near Zzyzx Road would remain unchanged.

The seasonal use of high-quality forage and cover in low-lying wash areas is expected to be the most common use of the Project site by bighorn sheep. During spring months, surface water and herbaceous forage in the wash located east of the South Arrays may benefit females and lambs. New vegetation growth that is available during limited times of the year are high in moisture and crude protein, and can improve overall condition and, hence, reproductive success the following year (Bleich, 2012). The Project design was modified several times to make allowance for bighorn sheep, including a roughly 0.25-mile setback from 20 percent slopes relative to the initial proposal.

Even with the setback, the assessment by Bleich (2012) indicates that the presence of Project facilities may reduce occasional, intermittent foraging by sheep in low-lying foraging areas adjacent to mountains. The base of the mountains located east of the East Arrays, for example, supports a large seasonal wash that may provide seasonal foraging opportunities, particularly for females and lambs.

Impacts to bighorn sheep would be reduced by the implementation of APM 75 and Mitigation Measure 3.4-3, which compensates for impacts to habitat connectivity between the north and south Soda Mountains by creating additional water sources that may increase sheep distribution capabilities and habitat availability in the north Soda Mountains.

Special-Status Bats

Night lighting close to the ground at the Project site and insect populations potentially associated with brine ponds could attract bats to the site. Because the Project has a relatively low profile that includes few poles or other tall structures, there is a low risk that special-status bats would collide with Project facilities, or would be directly impacted during operations.

There is a possibility that the Project could disrupt nighttime bat foraging activities beginning when the solar PV panels are installed and concluding when they are removed from the site as a potential consequence of the effects of reflective and polarized PV panel surfaces described above. Recent research indicates that the echo-reflection properties of smooth, horizontal objects can lead bats to mistake such objects for water, as demonstrated by repeated attempts to drink from such objects (Greif and Siemers, 2010). By comparison, textured objects do not elicit drinking behavior (Id.). Bats that attempt to drink from smooth PV panels could be more likely to collide with Project infrastructure; however, no collisions were observed during experiments (Id.) and it may be the exhaustion resulting from bats' apparent inability to learn from initial drinking attempts in the lab could pose the greater danger. Other recent research indicates that bats may learn from context to avoid non-water surfaces in situations where water is available as an alternative (Russo et al., 2012).

There also is a possibility that the reflective surfaces of PV panels could attract insects if the insects mistake the panels for water, and thereby create a concentrated food source for bats. See, for example, Horvath et al. (2009) and Horvath et al. (2010), which suggest that many insects are sensitive to polarized light pollution and consequently are attracted to PV panels. This could pose a greater collision risk to bats when feeding; however, most bats use echolocation to locate their prey and successfully avoid other objects.

Implementation of Mitigation Measure 3.4-1g, Bird and Bat Conservation Strategy, and Mitigation Measure 3.4-1h, Avian Monitoring Program, would reduce, but not avoid, potential impacts to special-status bats. Additional mitigation, such as making water available as an alternative, would be required to reduce the risk to special-status bats below established significance thresholds. However, the creation of a water source on or near the Project site could be an attractant to other wildlife and thereby cause significant adverse impacts to additional species. Because no additional feasible mitigation has been identified, potential risks to special-status bat species would remain during Project operation and maintenance.

Decommissioning

Decommissioning is anticipated to only directly affect areas that were previously disturbed during installation of Project facilities. Thus, the direct removal of wildlife habitat is not anticipated for decommissioning activities. Potential direct and indirect effects to wildlife populations during decommissioning would be similar to those described for the construction phase of the Project and include wildlife disturbance from noise, light, or dust, and the introduction of invasive plant species. Revegetation of the site and removal of exclusion fencing would benefit wildlife in the area; however, the restored wildlife access to large expanses of denuded habitat that lack food, water, and cover could subject special-status species such as desert tortoises to mortality hazards long after site decommissioning.

3.4.6.2 Alternative B

The Alternative B solar plant site would consist only of the East and South arrays as described for the Proposed Action, and no North Array would be constructed. Direct impacts on wildlife resources would be similar in nature, though anticipated impacts would be reduced. The types of impacts that would occur under Alternative B similarly would result in the direct and permanent loss of wildlife habitat within the disturbance footprint, and indirect impacts to wildlife resources would be similar to those discussed for the Project. The main differences in impacts between the Proposed Action and Alternative B are that the solar plant site would be smaller (and thereby would reduce impacts to wildlife) and a different realignment of Rasor Road would occur. Alternative B would have a permanent impact on approximately 1,817.47 acres of Mojave creosote bush scrub and cheesebush scrub that could support desert tortoise (Table 3.4-4). As discussed in Section 3.4.2, *Regional and Local Environmental Setting*, no desert tortoise sign was observed within the footprint of Alternative B (Figure 3.4-1). Thus, while less tortoise habitat would be disturbed, Alternative B would have similar direct impacts on areas that are actively used by tortoises.

TABLE 3.4-4
COMPARISON OF HABITAT IMPACTS TO DESERT TORTOISE HABITAT FROM ALL PROJECT ALTERNATIVES

	Proposed Action	Alternative B	Alternative C	Alternative D	Alternatives E and G	Alternative F
Total Potential habitat (acres)[a]	2,445.57	1,817.47	2,023.62	1,872.5	0	n/a[b]

NOTES:
[a] Acreages were derived from GIS analysis of vegetation layers on the Project site.
[b] Alternative F would not result in a change in the disturbance acreage of the Project site layout approved (i.e., the Proposed Action or Alternative B, C, or D)

Alternative B would have similar indirect impacts to Mojave fringe-toed lizard and special-status bats to those described for the Proposed Action. The burrowing owl has generally even, cosmopolitan distribution across each of the solar arrays. Thus, impacts to nesting and satellite burrows, and foraging habitat would be reduced under Alternative B, comparable to the reduced footprint of the alternative.

Alternative B would have similar direct and indirect impacts to avian species, including potential mortality and injury to special-status birds (such as the brown pelican, yellow-headed blackbird, and federally and state-endangered Yuma clapper rail) and some common bird species protected under the Migratory Bird Treaty Act, associated with the presence of PV panels as described for the Proposed Action.

Relative to bighorn sheep movement and foraging opportunities, the north Soda Mountains and portion of the North Array located north of I-15 are not extensively used by sheep. The northeastern portion of the array is located near a potential movement corridor at the Zzyzx Road overcrossing. Removal of the North Array under Alternative B may retain portions of the movement corridor that would be subject to development under the Proposed Action.

Required mitigation under Alternative B would be the same as that described for the Proposed Action, with adjustments to reduce the amount of off-site compensatory habitat needed to mitigate for desert tortoise impacts.

3.4.6.3 Alternative C

The Alternative C solar plant site would consist only of the North and South arrays as described for the Proposed Action, and no East Array would be constructed. Direct impacts to wildlife resources would be similar in nature, though anticipated impacts would be reduced.

The types of impacts that under Alternative C similarly would result in the direct and permanent loss of wildlife habitat within the disturbance footprint, and indirect impacts to wildlife resources would be similar to those discussed for the Proposed Action. The key difference in impacts between the Proposed Action and Alternative C is that the solar plant site would be smaller to minimize impacts to wildlife. Alternative C would have a permanent impact on approximately 2,023.62 acres of Mojave creosote bush scrub and cheesebush (Table 3.4-4). As discussed in Section 3.4.2, most desert tortoise sign in the requested ROW area was observed in or adjacent to the East Arrays (see Figure 3.4-1). Alternative C would have substantially fewer direct and impacts on individual tortoises and occupied tortoise habitat compared to the Proposed Action.

Alternative C would have similar indirect impacts to Mojave fringe-toed lizard and special-status bats to those described for the Proposed Action. Impacts to nesting and satellite burrows, and foraging habitat would be reduced under Alternative C, comparable to the reduced footprint of the alternative.

Alternative C would have similar direct and indirect impacts to avian species, including potential mortality and injury to special-status birds (such as the brown pelican, yellow-headed blackbird, and federally and state-endangered Yuma clapper rail) and some common bird species protected under the Migratory Bird Treaty Act, associated with the presence of PV panels as described for the Proposed Action.

Relative to bighorn sheep movement and foraging opportunities, Alternative C would construct fewer facilities at the base of the south Soda Mountain. Removal of the East Array area may

allow movement of sheep across the site to undercrossings beneath 1-15. Sheep would not need to travel between solar arrays under this alternative; thus, there may be some benefits related to retention of movement corridors.

Required mitigation under Alternative C would be the same as that described for the Proposed Action, with adjustments to reduce the amount of off-site compensatory habitat needed to mitigate for desert tortoise impacts.

3.4.6.4 Alternative D

The Alternative D solar plant site would reduce the size of the South Arrays compared to the Proposed Action. Direct impacts to wildlife resources would be similar in nature, though anticipated impacts would be reduced. The types of impacts that under Alternative D would result in the direct and permanent loss of wildlife habitat within the disturbance footprint, and indirect impacts to wildlife resources would be similar to those discussed for the Proposed Action. The key difference in impacts between the Proposed Action and Alternative D is that the solar plant site would be smaller to minimize impacts to wildlife. Alternative D would cause a permanent impact on approximately 1,872.5 acres of desert tortoise habitat, principally within Mojave creosote bush scrub (Table 3.4-4).

As discussed in Section 3.4.2, most desert tortoise sign in the Project ROW was observed in or adjacent to the East Array, which would be impacted under Alternative D (Figure 3.4-1). Little desert tortoise sign was observed during surveys in the South Arrays. Thus, compared to the Proposed Action, Alternative D would have comparable direct impacts on areas that are actively used by tortoises (i.e., the East Arrays), while affecting less overall potential habitat.

Because Alternative D would provide a greater setback from sand dunes located south of the Project site, a minor indirect impact to Mojave fringe-toed lizard habitat (i.e., invasion by non-native weeds) would be incrementally reduced under this alternative. Impacts to special-status bats would be similar to those described for the Proposed Action. Impacts to burrowing owl nesting and satellite burrows, and foraging habitat would be reduced under Alternative D, comparable to the reduced footprint of the alternative.

Alternative D would have similar direct and indirect impacts to avian species, including potential mortality and injury to special-status birds (such as the brown pelican, yellow-headed blackbird, and federally and state-endangered Yuma clapper rail) and some common bird species protected under the Migratory Bird Treaty Act, associated with the presence of PV panels as described for the Proposed Action.

Relative to bighorn sheep movement and foraging opportunities, Alternative D would construct fewer facilities in the southern portion of the Project ROW, which may not experience extensive sheep use. This alternative would not move facilities farther from potential foraging sheep habitat within desert washes located east of the East and South arrays. Thus, Alternative D may have impacts to bighorn sheep comparable to those described for the Proposed Action.

Required mitigation under Alternative D would be the same as that described for the Proposed Action, with adjustments to reduce the amount of off-site compensatory habitat needed to mitigate for desert tortoise impacts.

3.4.6.5 Alternative E: No Action/No Project

Under this alternative, the Project would not be approved and lands administered by BLM would continue to be managed consistent with current land use designations in the CDCA Plan. No change from existing conditions would occur, and no impact to wildlife would result.

3.4.6.6 Alternative F: CEQA No Project

Under Alternative F, a solar energy facility and related infrastructure could be developed on the same site as the Proposed Action, but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. Furthermore, any of the alternatives previously described (Proposed Action or Alternative B, C, or D) could be developed.

Alternative F would occupy the same footprint to the Proposed Action or other action alternative, if approved, and would result in similar impacts to wildlife resources related to construction, operation and maintenance, and decommissioning to those of the Project, or comparable to those of Alternatives B, C, and D. The transportation of water to the Project site that would occur under Alternative F would have no impact on wildlife species.

3.4.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the Project would not be approved, future solar development would be precluded, and the site would continue to be managed consistent with current land use designations in the CDCA Plan. All uses except solar development that are allowable on Class L, M, and I lands would continue to be available on those lands within the Project site. No change from existing conditions would occur, and no impact to wildlife would result.

3.4.7 Cumulative Effects

The geographic scope for this cumulative impact analysis considers the incremental effects of the analyzed alternatives as combined with past, present, and reasonably foreseeable projects in the cumulative scenario that could affect the same wildlife species or habitats as the Proposed Action or alternatives. For wildlife resources, the geographic scope of analysis is based on species distribution and landforms surrounding the Project site and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The analysis considers potential effects at different scales for different species, with the analysis generally concentrating on wildlife resources in the I-15 corridor, Soda Mountain valley, and the Soda Mountain range and adjacent mountain ranges in central San Bernardino County. This scale was used to analyze cumulative effects on Mojave fringe-toed lizard, migratory birds, western burrowing owl, American badger, kit fox, and desert bighorn sheep. The geographic scope for assessing cumulative effects to desert tortoise

considered existing and future projects within 20 miles of the Proposed Action and golden eagle considered projects within 10 miles. The temporal scope of cumulative effects on wildlife resources encompasses the duration of all construction, operation and maintenance, and decommissioning activities, including site reclamation and restoration.

The regional Project area has seen limited past development at the scale presented by current and future solar development. Past development in the vicinity of the Project has included minor improvements to the I-15 transportation corridor and utility corridors. Environmental conditions reflecting any ongoing impacts of these past actions are described in Section 3.4.2.

Table 3.1-3 lists other current and foreseeable projects near the action area, including other proposed or approved renewable energy projects. Within the geographic context for cumulative effects defined above, four projects were identified within a 10-mile radius of the Project site: the XpressWest High Speed Passenger Rail Project that parallels I-15 from Victorville to Las Vegas; the Calnev Pipeline Expansion Project that also parallels 1-15; and the Silurian Valley Wind and Silurian Valley Solar projects, located approximately 8 miles northeast of the Proposed Action. Both the XpressWest and Calnev projects traverse the Project study corridor. No other cumulative projects were identified within 20 miles of the Proposed Action.

Desert Tortoise

The cumulative effects study area for desert tortoise considered existing and future projects within 20 miles of the Proposed Action that are located within the Western Mojave Recovery Unit planning area, as defined in the Desert Tortoise Recovery Plan (USFWS, 2011a). The Recovery Plan focuses on desert tortoise populations within each of five distinct recovery units, with the fundamental recovery goal of ensuring sufficient population size and stability within an ample amount of protected habitat in each area. The Proposed Action is located 6.8 miles east of the Ord-Rodman DWMA and Critical Habitat Unit (CHU) in the West Mojave Recovery Unit and 11.0 miles west of the Piute-Eldorado Valley CHU in the Eastern Mojave Recovery Unit.

Desert tortoises occur in low densities in the Soda Mountain valley, and the Project site is not located within or between lands that are specifically managed for desert tortoise conservation. The Proposed Action and alternatives would not affect the Ord-Rodman CHU or Piute-Eldorado Valley CHU, nor would it affect tortoises associated with these areas. The Silurian Valley Wind and Silurian Valley Solar projects, for which the requested ROWs would cover a combined 13,940 acres, are the only other large-scale projects within 20 miles of the Proposed Action that would affect desert tortoise. These project sites are also located outside of designated tortoise CHUs.

The Project's direct and indirect effects to tortoises and their habitat would be offset through the application of APMs 44 (WEAP training), 66 (desert tortoise exclusion fencing), 67 and 68 (tortoise clearance surveys), 70 (fence inspections), 71 (biological monitoring), 72 (Raven Monitoring and Control Plan), 73 (compensatory mitigation), and 74 (limits on pets); and the implementation of Mitigation Measures 3.4-2a (desert tortoise protection), 3.4-2b (Desert Tortoise Translocation Plan), 3.4-2c (desert tortoise compliance verification), and 3.4-2d (desert tortoise

compensatory mitigation). The loss of tortoise habitat and direct and indirect effects to this species are anticipated to result in cumulative effects on populations; however, the implementation of the required protection measures that include salvage of desert tortoises, compensatory mitigation, and site restoration following decommissioning would ensure that the loss of tortoise habitat is adequately compensated for and comparable or higher quality habitat would be protected off-site.

Mojave Fringe-toed Lizard

For cumulative projects, the XpressWest High Speed Passenger Rail Project would permanently convert 3.6 acres and temporarily affect approximately 8.3 acres of Mojave fringe-toed lizard habitat (FRA, 2011). The Calnev Pipeline Expansion Project borders, but would not impact habitat for this species (BLM, 2012). The Proposed Action would not directly affect Mojave fringe-toed lizard or habitat for this species. The XpressWest Project would not impact Mojave fringe-toed lizard that occurs south of the south arrays. Thus, cumulative impacts to lizard populations were not identified. Potential indirect effects to Mojave fringe-toed lizard from the Proposed Action would be minimized through implementation of APM 44 (WEAP training) and 50 (IWMP) (Appendix E-2), and of Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP).

Migratory Birds (Nesting)

Direct impacts to actively nesting birds would be avoided through the implementation of measures that would provide consistency with Fish and Game Code Sections 3503.5 and 3511, and the MBTA. Under these laws, the removal or disturbance of active nests is prohibited. With implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), 3.4-1c (WEAP), 3.4-1g (Bird and Bat Conservation Strategy), and 3.4-4 (preconstruction nesting bird surveys and avoidance measures), the Project would not impact migratory birds other than those that are individually discussed in this Draft PA/EIS/EIR (e.g., burrowing owl). Other future projects would be required to implement similar measures to ensure compliance with federal and state bird protection regulations, resulting in a small, but negligible cumulative effect to migratory birds.

Collision Risks to Special-status, Resident, and Migratory Birds and Special-Status Bats

The potential cumulative impact of numerous solar facilities relating to collisions of special-status and other birds (including, for example, brown pelican, Yuma clapper rail, and yellow-headed blackbird) and special-status bats with solar facility infrastructure is of concern, particularly given the number and size of existing and proposed solar facilities in the geographic scope; however, given that the avian and bat collision impact has only recently been described, the potential cumulative impact can only be speculated at this time. Thus, while there is a potential for cumulative impacts to avian and bat species, the scale cannot be fully known.

With the implementation of Mitigation Measure 3.4-1h, the Project would be able to identify its incremental direct and indirect impact on special-status, resident, and migratory birds and special-

status bats. Even so, monitoring evidence from the Genesis and Desert Sunlight projects in Riverside County suggests that common and special-status birds and bats could be attracted to the Project site and that limited injury and mortality could be expected (see, e.g., Genesis Solar, LLC, 2013a, 2013b, and 2013c; Ironwood Consulting, Inc., 2012, 2013a, 2013b). It is not known whether the contribution of each project to the overall cumulative impact to common and special-status birds and bats would be additive, with similar mortality observed between different project sites or whether some areas would be more prone to impacts due to the presence (or absence) of nearby surface water or other features. The Genesis and Desert Sunlight projects, for example, are located between the Colorado River and Salton Sea, and are each within 25 to 50 miles of both water bodies, whereas the Project would be located 90 miles west of the Colorado River. As an example of potential impacts situated relatively closer to the Project site, the Ivanpah Solar Electric Generating System Project located roughly 40 miles east of the Project reported 30 bird fatalities in September 2013 (BrightSource, 2013). The cumulative contribution of individual projects to the overall potential cumulative impact cannot be known. However, each operational facility can be expected to contribute incrementally to the injury and mortality of avian and bat species.

At this time, no feasible, effective mitigation measures have yet been developed that would lessen this potential adverse effect; however, the adaptive monitoring program within the Bird and Bat Conservation Strategy required by Mitigation Measure 3.4-1g, and the Avian Monitoring Program required by Mitigation Measure 3.4-1h, set up a decision-making framework for reviewing, characterizing, and responding to mortality and injury monitoring findings. The Avian Monitoring Program for the Project would provide a mechanism to characterize the overall magnitude of potential avian impacts. Following the implementation of mitigation measures, however, it cannot be said with sufficient certainty that the threat of avian and bat impacts would be eliminated. Given the large number of proposed solar facilities under the cumulative scenario, construction monitoring results from the Genesis and Desert Sunlight facilities strongly indicate that ongoing, unmitigated risks will remain at most solar facilities. Thus, the cumulative impact to special-status and other birds and to special-status bats would remain.

Golden Eagle

The study area for golden eagle was consistent with USFWS guidance (Pagel, et al., 2010) and considered a 10-mile buffer from the Project boundary. The cumulative analysis for golden eagle identified four projects within 10 miles of the Project: the XpressWest, Calnev, Silurian Valley Wind, and Silurian Valley Solar projects. Based on a review of known and historic golden eagle breeding sites in the 10-mile golden eagle study buffer, it is likely that wind turbines installed for the Silurian Valley Wind Project could impact golden eagles both through direct mortality and habitat loss. The XpressWest and Calnev projects would likely have insignificant habitat loss effects on this species. Approximately 290,000 acres of land of unknown habitat value for golden eagle occurs within the 10-mile study area for the Proposed Action. Within this study area, approximately 2,729 acres would be impacted by the Silurian Valley Wind and Silurian Valley Solar projects, with additional effects beyond the study buffer, and up to 2,450 acres would be affected by the Proposed Action (Table 3.4-3). Impacts from the XpressWest and Calnev project study corridors are unknown at this time. Thus, it is estimated that cumulative projects would

impact approximately 5,200 acres of habitat within 10 miles of the Proposed Action, or approximately 1.8 percent of potentially available foraging habitat. Following USFWS guidance, the loss of potential golden eagle foraging habitat would be considered significant if losses occurred within 1 mile of an active nest. However, the nearest active nest is at least 4 miles from the Project site and no nests were identified near other projects considered in the cumulative scenario. Few, if any, impacts are anticipated to golden eagle nesting sites because eagles locally nest in remote mountainous areas where no active projects are proposed. No direct or indirect effects are anticipated to golden eagle during construction, operation and maintenance, or decommissioning. Cumulative effects related to loss of foraging habitat would be negligible because the Proposed Action and cumulative projects constitute a small fraction of available foraging habitat, which is not located near any identified active nest sites.

Western Burrowing Owl, American Badger, and Desert Kit Fox

The Soda Mountain valley provides extensive habitat for burrowing owl, American badger, and desert kit fox. While each species has its own specific habitat requirements, there is considerable overlap in the types of habitat used by these species. The four identified cumulative projects within 10 miles of the Project would presumably result in impacts to burrowing owl, American badger, and desert kit fox similar to those for the Project. Such effects include the direct loss of suitable habitat, loss of individual animals, or indirect effects from human presence that result in changes to habitat quality during construction, operation and maintenance, and decommissioning. The implementation of mitigation measures identified to protect American badger and desert kit fox (3.4-1b), protect burrowing owls (3.4-1f), and mitigate habitat losses (3.4-2d) would reduce Project impacts to these species during construction, operation, and decommissioning.

Desert Bighorn Sheep

The Project is not located within a desert bighorn sheep WHMA and would not result in the loss of potential habitat for this species within a WHMA. Within the Soda Mountains, the Proposed Action as well as the XpressWest and Calnev projects are located within habitat for bighorn sheep. The portions of the Silurian Valley Wind and Silurian Valley Solar project sites that occur within 10 miles of the Project site are located on alluvial fans immediately north of the town of Baker, in what is understood to be seldom-used potential sheep habitat. Should the north Soda Mountains become occupied by bighorn sheep as a result of habitat improvements (e.g., water sources) or improvements to movement corridors, the XpressWest project would be the only one among the cumulative projects that could have lasting impacts to bighorn sheep movement. Both the XpressWest project and the Proposed Action or an action alternative could reduce sheep access to culverts and overpasses that provide protected movement across I-15. Additionally, the XpressWest project would create an additional source for sheep mortality and could dissuade sheep from using movement corridors. Considered together with the impacts of the Project as reduced by Mitigation Measure 3.4-3, the impacts of the XpressWest and Calnev projects (and to a much lesser extent, the Silurian Valley wind and solar projects) would each affect bighorn sheep habitat availability and movement.

Local Policies or Ordinances Protecting Biological Resources

The Project is not proposed within the boundaries of any adopted HCP or natural community conservation plan. The Project site is within the CDCA and is within the planning boundaries of the WEMO Plan amendment to the CDCA Plan. The Project was planned and designed in coordination with the BLM with the intent of providing consistency with the WEMO Plan and CDCA Plan. Similarly, the XpressWest and Calnev projects would conflict with local policies or ordinances protecting biological resources, and the Silurian Valley Wind and Silurian Valley Solar projects are not anticipated to conflict with such policies; thus, no cumulative effect was identified.

3.4.8 Mitigation Measures

The following mitigation measures are designed to avoid or reduce impacts to wildlife species during construction, operation, maintenance, and decommissioning of the Proposed Action.

Mitigation Measure 3.4-1a: Compliance Monitoring by the Designated Biologist. Prior to ground-disturbing activities, an individual shall be designated and approved by the BLM and Resources Agencies (USFWS and CDFW, as appropriate) as a Designated Biologist (i.e., field contact representative). Designated Biologist qualifications are presented in Mitigation Measure 3.3-1: *Designated Biologist*.

The Designated Biologist shall be employed for the period during which on-going construction and post-construction monitoring and reporting by an approved biologist is required. Each successive Designated Biologist shall be approved by the BLM's Authorized Officer. The Designated Biologist shall have the authority to ensure compliance with all measures set forth in the Biological Opinion and CESA Section 2081 take authorization and with all mitigation measures included herein, and will be the primary agency contact for the implementation of these measures. The Designated Biologist will have the authority and responsibility to halt any project activities that are in violation of the terms of the Biological Opinion, Section 2081 take authorization, or Project mitigation measures. A list of responsibilities of the Designated Biologist is summarized below.

To avoid and minimize effects to biological resources, the Designated Biologist shall:

1. Notify the BLM's Authorized Officer and USFWS at least 14 calendar days before initiation of ground-disturbing activities.
2. Immediately notify the BLM's Authorized Officer in writing if the Applicant/Owner does not comply with any of the mitigation measures or terms of the Biological Opinion and/or the Section 2081 take authorization including, but not limited to, any actual or anticipated failure to implement such measures within the periods specified.
3. Conduct compliance inspections daily during on-going construction as clearing, grubbing, and grading are completed, and submit a monthly compliance report to BLM's Authorized Officer until construction is complete.

Mitigation Measure 3.4-1b: Biological Monitoring during Construction. Biological Monitor(s) shall be employed to assist the Designated Biologist in conducting pre-construction surveys and monitoring ground disturbance, grading, construction, operation

and maintenance, decommissioning, and restoration activities. The Biological Monitor(s) shall have sufficient education and field experience to understand resident wildlife species biology, have experience conducting desert tortoise, burrowing owl, kit fox, and badger field monitoring, and be able to identify these species and their sign (including active burrows). The Designated Biologist shall submit a resume, at least three (3) references, and contact information for each prospective Biological Monitor to the BLM, and the Wildlife Agencies for approval. To avoid and minimize effects to biological resources, the Biological Monitor(s) will assist the Designated Biologist with the following:

1. Be present during construction activities that take place in suitable habitat for desert tortoise, burrowing owl, kit fox, badger, or other protected species to prevent or minimize harm or injury to these species.
2. Activities of the Biological Monitor(s) include, but are not limited to, ensuring compliance with all avoidance and minimization measures; monitoring for desert tortoise, burrowing owl, kit fox, badger, and other protected species; halting construction activity in the area if an individual is found; and checking the staking/flagging of all disturbance areas to be sure that they are intact and that all construction activities are being kept within the staked/flagged limits. If a desert tortoise, burrowing owl, kit fox, badger, or other protected species is found within a work area, the Biological Monitor(s) shall immediately notify the Designated Biologist, who shall determine measures to be taken to ensure that the individual is not harmed.
3. Inspect the Project area for any special-status wildlife species.
4. Ensure that potential habitats within the construction zone are not occupied by special-status species (e.g., potential burrows or nests are inspected).
5. In the event of the discovery of a non-listed, special-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat at least 200 feet from the limits of construction activities.
6. At the end of each work day, inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls will not be immediately backfilled following inspection, the Biological Monitor(s) will ensure that the construction crew slopes the ends of the excavation (3:1 slope) to provide wildlife escape ramps or will ensure that the construction crew completely and securely covers the excavation to prevent wildlife entry.
7. Inspect the site to help ensure trash and food-related waste is place in closed-lid containers and to ensure that workers do not feed wildlife. Also inspect the work area each day to ensure that no microtrash (e.g., bolts, screws, etc.) is left behind.

Mitigation Measure 3.4-1c: Worker Environmental Awareness Program (WEAP). Prior to Project initiation, the Designated Biologist shall develop and implement the WEAP (APM 44), which shall be available in English and Spanish. Wallet-sized cards summarizing the information shall be provided to all construction and operation and maintenance personnel. The WEAP shall include the following:

1. An explanation of the sensitivity of the vegetation communities and special-status plant and wildlife species within and adjacent to work areas, and proper identification of these resources.

2. Biology and status of the desert tortoise, golden eagle, burrowing owl, other nesting birds, kit fox, and American badger and measures to reduce potential effects to these species.
3. Actions and reporting procedures to be used if desert tortoise, burrowing owl, other nesting birds, kit fox, or American badger are encountered.
4. An explanation of the function of flagging that designates authorized work areas.
5. Driving procedures and techniques to reduce mortality of wildlife on roads.
6. Discussion of the federal and state Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act and the consequences of non-compliance with these acts.
7. The importance of avoiding the introduction of invasive weeds into the Project area and surrounding areas.
8. A discussion of general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures.
9. A review of mitigation requirements.

Mitigation Measure 3.4-1d: Speed Limits. Speed limits along all access roads outside of permanent desert tortoise fencing shall not exceed 15 miles per hour to minimize dust during construction activities. Speed limits within permanent desert tortoise fencing shall not exceed 25 miles per hour to minimize impacts during operations and maintenance. Nighttime vehicle traffic associated with Project activities shall be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species.

Mitigation Measure 3.4-1e: Lighting Specifications to Minimize Bird and Bat Impacts. The Applicant/Owner shall minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.

As a component of the lighting plan required in Mitigation Measure 3.18-1, all exterior lighting at operation and maintenance facilities, substations, and appurtenant structures shall be of the lowest illumination required for security and human safety. The Applicant/Owner shall install and continuously use and maintain lights with motion or heat sensors and switches to keep lights off when not required. Light fixtures shall be fully shielded and directed downward to minimize illumination above the horizontal plane. The Applicant/Owner shall minimize use of high-intensity lighting and steady-burning or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights.

Mitigation Measure 3.4-1f: Burrowing Owl Protection Measures. No more than 30 days prior to the start of construction, a pre-construction survey for burrowing owls in conformance with the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012) shall be completed within suitable habitat at every work area and within a 150-meter buffer zone of each work area. The Applicant/Owner shall submit the results of the pre-construction survey to BLM's Authorized Officer and CDFW. The Applicant/Owner shall also submit evidence of conformance with federal and state regulations regarding the protection of the burrowing owl by demonstrating compliance with the following:

1. Unless otherwise authorized by BLM and CDFW, no disturbance shall occur within 160 feet (50 meters) of occupied burrows during the non-breeding season (September 1 through January 31) or within 650 feet (500 meters) during the breeding season (February 1 through August 31).

2. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31). In the event that an occupied burrow absolutely cannot be avoided (e.g., due to physical or safety constraints), passive relocation of owls may be implemented prior to construction activities only if a qualified biologist approved by BLM verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Eviction outside the nesting season may be permitted pending evaluation of eviction plans (developed in accordance with BLM protocol for burrowing owls) by CDFW and receipt of formal written approval from BLM authorizing the eviction. A Burrowing Owl Mitigation and Monitoring Plan shall be submitted to the BLM's Authorized Officer and CDFW for review and approval prior to passive relocation.

3. Unless otherwise authorized by BLM, a 650-foot buffer within which no activity will be permissible will be maintained between Project activities and nesting burrowing owls during the nesting season. This protected area will remain in effect until August 31 or at BLM's discretion and based upon monitoring evidence, until the young owls are foraging independently.

4. If accidental take (disturbance, injury, or death of owls) occurs, the Designated Biologist will be notified immediately.

5. Impacts to active burrowing owl territories shall be mitigated at a 1:1 ratio through a combination of off-site habitat compensation and/or off-site restoration of disturbed habitat capable of supporting this species. The acquisition of occupied habitat off-site shall be in an area where turbines would not pose a mortality risk. Acquisition of habitat shall be consistent with the CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The preserved habitat shall be occupied by burrowing owl and shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified ornithologist. The site shall be approved by BLM. Land shall be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. The off-site area to be preserved can coincide with off-site mitigation lands for permanent impacts to sensitive vegetation communities, with the approval of the BLM and CDFW.

Mitigation Measure 3.4-1g: Bird and Bat Conservation Strategy (BBCS). The Applicant/Owner shall develop a BBCS to address Project impacts to special-status avian and bat species. The Applicant/Owner shall submit the BBCS to the BLM and USFWS for review and approval prior to initiation of Project construction. A raven management element shall be included in the BBCS that includes measures such as storage of garbage in raven-proof containers and installation of anti-nesting devices on structures where raven nests could be built.

Mitigation Measure 3.4-1h: Avian Monitoring Program. An Avian Monitoring Program shall be initiated and approved pre-construction and continue for at least three years following commercial operation (and longer if determined necessary and appropriate by the Compliance Project Manager (CPM) that shall include, at a minimum, the following provisions:

1. The Project owner will survey and monitor on-site and off-site avian use and behavior to document species composition on and offsite, compare onsite and off-site rates of avian and bat use, document changes in avian and bat use over time (pre and post construction), and evaluate the changes in annual abundance and distribution of birds in and near the facility. The Project owner will submit all data gathered onsite to the CPM as specified herein, or as requested by the CPM, and also will make consulting biologists available to answer CPM inquiries.

2. The Project owner will implement a statistically robust avian and bat mortality and injury monitoring program to identify the extent of potential avian or bat mortality or injury from collisions with facility structures, including:

    a) assessing levels of collision-related mortality and injury with PV panels, perimeter fences, gen-tie line poles or wires, and other project features and structures;

    b) documenting flight spatial patterns via radar that may be associated with collision-related mortality and injury, if any.

3. The Project owner will implement an adaptive management and decision-making framework for reviewing, characterizing, and responding to monitoring results.

4. The Project owner will identify specific conservation measures and/or programs to avoid, minimize, rectify, reduce, or eliminate avian injury or mortality over time and will evaluate the effectiveness of those measures.

The Avian Monitoring Program shall include the following components:

1. A description and summary of the baseline survey methods, raw data, and results.

2. Full survey methodology and field documentation, identification of appropriate onsite and offsite survey locations, control sites, and the seasonal considerations. Bat acoustic sampling may be implemented depending on results of the Project owner's baseline studies, including preconstruction data.

3. Avian and bat mortality and injury monitoring that includes:

    a) Onsite monitoring that will systematically survey representative locations within the facility, at a level that will produce statistically robust data; account for potential spatial bias and allow for the extrapolation of survey results to non-surveyed areas and the survey interval based on scavenger and searcher efficiency trials and detection rates.

    b) Low-visibility and high-wind weather event monitoring to document potential weather-related collision risks that may be associated increased risk of avian or bat collisions with project features, including foggy, highly overcast, or rainy night-time weather typically associated with an advancing frontal system, and high wind events (40 miles per hour winds) are sustained for period of greater than 4 hours. The monitoring report shall include survey frequency, locations and methods.

    c) Statistically robust scavenger and searcher efficiency trials prior and post construction to document the extent to which avian or bat fatalities remain visible over time and can be detected within the project area and to adjust the survey timing and survey results to reflect scavenger and searcher efficiency rates.

d) Statistical methods used to generate facility estimates of potential avian and bat impacts based on the observed number of detections during standardized searches during the monitoring season for which the cause of death can be determined and is determined to be facility-related.

e) Field detection and mortality or injury identification, cause attribution, handling and reporting requirements.

4. All post-construction monitoring studies included in the Avian Monitoring Program shall be conducted by a third party contractor for at least three years following commercial operation and approval of the Avian Monitoring Program by the CPM. All surveys and monitoring studies included in the Avian Monitoring Program shall be conducted during construction and commercial operation. At the end of the three-year period, the CPM shall determine whether the survey program shall be continued.

5. An adaptive management program shall be developed to identify and implement reasonable and feasible measures that would reduce levels of avian or bat mortality or injury attributable to Project operations and facilities.

6. Monitor the death and injury of birds and bats from collisions with facility features. The monitoring data shall be used to inform an adaptive management program that would avoid and minimize Project-related avian and bat impacts. The study design shall be approved by the CPM in consultation with CDFW and USFWS. The Avian Monitoring Program shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The program also shall include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias.

Mitigation Measure 3.4-2a: Desert Tortoise Protection. The Applicant/Owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* (USFWS, 2009d) or more current guidance provided by CDFW and USFWS. The Applicant/Owner shall also implement all terms and conditions described in the Biological Opinion to be prepared by USFWS. These measures include, but are not limited to, the following:

1. ***Desert Tortoise Fencing along I-15.*** If required by the USFWS, to avoid increases in vehicle-related mortality from disruption of local movement patterns along the existing ephemeral wash systems, desert tortoise-proof fencing shall be installed along the existing freeway right-of-way fencing on both sides of I-15 for the entire east-west dimension of the Project site. The tortoise fencing shall be designed to direct tortoises to existing undercrossing to provide safe passage under the freeway, and shall be regularly inspected and maintained for the life of the Project.

2. ***Desert Tortoise Exclusion Fence Installation.*** To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along road corridors during construction. The proposed alignments for the permanent perimeter fence and temporary fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and temporary fencing areas shall be conducted by the Designated Biologist(s) using

techniques outlined in the USFWS' 2009 Desert Tortoise Field Manual and may be conducted in any season with USFWS and CDFW approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100 percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line covering an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual*. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (USFWS, 2009d).

a. *Timing, Supervision of Fence Installation*. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. *Fence Material and Installation*. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

c. *Security Gates*. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry

d. *Fence Inspections*. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the Project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

3. ***Desert Tortoise Clearance Surveys within Solar Arrays*.** Clearance surveys shall be conducted in accordance with the USFWS *Desert Tortoise Field Manual* (USFWS, 2009d) (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the Project area by walking transects no more than 15 feet apart. If a desert tortoise is located during the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance

surveys of the plant site may only be conducted when tortoises are most active (April through May or September through October) unless the Project receives approval from CDFW and USFWS. Clearance surveys of linear features may be conducted during any time of the year. Any tortoise located during clearance surveys of solar arrays shall be translocated or relocated and monitored in accordance with the Desert Tortoise Translocation Plan (DTTP; Mitigation Measure 3.4-2b)

a. *Burrow Searches*. During clearance surveys all desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS *Desert Tortoise Field Manual* (USFWS, 2009d). To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined in accordance with the DTTP. Tortoises taken from burrows shall be translocated as described in the DTTP.

b. *Burrow Excavation/Handling*. All potential desert tortoise burrows located during clearance surveys shall be excavated by hand, tortoises removed, and burrows collapsed or blocked to prevent occupation by desert tortoises in accordance with the DTTP. All desert tortoise handling and removal and burrow excavations, including nests, shall be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS *Desert Tortoise Field Manual* (USFWS, 2009d).

4. ***Monitoring Following Clearing*.** Following the desert tortoise clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the Project site to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or Biological Monitor shall be on-site for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the DTTP.

5. ***Reporting*.** The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled tortoise. Desert tortoise moved from within Project areas shall be marked and monitored in accordance with the DTTP.

Mitigation Measure 3.4-2b: Desert Tortoise Translocation Plan. The Applicant/Owner shall develop and implement a USFWS-approved Desert Tortoise Translocation Plan (DTTP). The DTTP shall include measures to minimize the potential for repeated translocations of individual desert tortoises. The goals of the DTTP shall be to: relocate all desert tortoises from the Project site to nearby suitable habitat; minimize impacts on resident desert tortoises outside the Project site; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring. The final DTTP shall be based on the draft Desert Tortoise Translocation Plan prepared by the Applicant/Owner (Panorama Environmental, Inc., 2013d) and shall include all revisions deemed necessary by BLM, USFWS, and CDFW.

Mitigation Measure 3.4-2c: Desert Tortoise Compliance Verification. The Applicant/Owner shall provide BLM, CDFW, and USFWS staff with reasonable access to the Project site and compensation lands under the control of the Project owner and shall otherwise fully cooperate with the BLM's efforts to verify the Project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The Designated Biologist shall do all of the following:

1. ***Notification.*** Notify the BLM Authorized Officer at least 14 calendar days before initiating construction-related ground disturbance activities; immediately notify the BLM in writing if the Project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification;

2. ***Monitoring During Grubbing and Grading.*** Remain on site daily while vegetation salvage, grubbing, grading, and other ground-disturbing construction activities are taking place to avoid or minimize take of listed species, and verify personally or have Biological Monitor(s) verify compliance with all impact avoidance and minimization measures, including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

3. ***Monthly Compliance Inspections.*** Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the BLM, USFWS, and CDFW during construction.

4. ***Notification of Injured or Dead Listed Species.*** If an injured or dead federal- or state-listed species is detected on or near the Project site, BLM, CDFW, and USFWS shall be notified immediately by phone. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via facsimile or electronic communication shall be submitted to these agencies within two calendar days of the incident and include the following information as relevant:

    a. *Injured Desert Tortoise*. If a desert tortoise is injured as a result of Project-related activities during construction, the Designated Biologist or Biological Monitor(s) shall immediately take it to a CDFW-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the Applicant/Owner. Following phone notification as required above, the CDFW and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, and circumstances of the incident and the name of the facility where the animal was taken.

    b. *Desert Tortoise Fatality*. If a desert tortoise is killed by Project-related activities during construction, operation and maintenance, or decommissioning, a written report with the same information as an injury report shall be submitted to the BLM, CDFW, and USFWS. These desert tortoises shall be salvaged according to federally established guidelines. The Applicant/Owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

5. ***Final Listed Species Report.*** The Designated Biologist shall provide BLM a Final Listed Species Mitigation Report that includes, at a minimum: 1) all available

information about Project-related incidental take of listed species; 2) information about other Project impacts on the listed species; 3) construction dates; 4) an assessment of the effectiveness of conditions of certification in minimizing and compensating for Project impacts; 5) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future Projects on the listed species; and 6) any other pertinent information, including the level of take of the listed species associated with the Project.

6. ***Stop Work Order.*** The BLM may issue the Project owner a written stop work order to suspend any activity related to the construction or operation of the Project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or protected species. The Project owner shall comply with the stop work order immediately upon receipt thereof.

Mitigation Measure 3.4-2d: Desert Tortoise Compensatory Mitigation: To fully mitigate for habitat loss and potential take of desert tortoise, the Project owner shall provide compensatory mitigation consistent with federal requirements, adjusted to reflect the final Project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the proposed Project, including all Project linears, as well as undeveloped areas inside the Project's boundaries that will no longer provide viable long-term habitat for the desert tortoise. To satisfy this condition, the Project owner shall acquire, protect, and transfer 1 acre of desert tortoise habitat for every acre of habitat within the final Project footprint, and provide associated funding for the acquired lands, as specified below. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as provided below in section 3.i. of this measure.

If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands include all of the following:

1. ***Selection Criteria for Compensation Lands.*** The compensation lands selected for acquisition in fee title or in easement shall:

    a. be within the Western Mojave Recovery Unit, as defined in the 2011 Revised Recovery Plan (USFWS, 2011a), with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands;

    b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

    c. be prioritized near larger blocks of lands that are either already protected or planned for protection, such as DWMAs within the Western Mojave Recovery Unit (or nearby portions of the Eastern Mojave Recovery Unit with prior USFWS approval) or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

d. be connected to lands with desert tortoise habitat equal to or better quality than the Project site, ideally with populations that are stable, recovering, or likely to recover;

e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible;

f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

h. have water and mineral rights included as part of the acquisition, unless the BLM, in consultation with CDFW and USFWS, agrees in writing to the acceptability of the land.

2. ***Review and Approval of Compensation Lands Prior to Acquisition.*** The Project owner shall submit a formal acquisition proposal to the BLM, CDFW, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the BLM in consultation with CDFW and the USFWS shall be required for acquisition of all compensatory mitigation parcels.

3. ***Compensation Lands Acquisition Requirements.*** The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the BLM, in consultation with CDFW and USFWS, have approved the proposed compensation lands:

a. *Preliminary Report*. The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the BLM, in consultation with CDFW and USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board.

b. *Title/Conveyance*. The Project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the BLM. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or BLM under terms approved by the BLM. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFW in a form approved by CDFW. If an approved non-profit holds a conservation easement, CDFW shall be named a third party beneficiary.

c. *Initial Habitat Improvement Fund*. The Project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code Section 65965) and if it meets the approval of CDFW and the BLM. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.

d. *Property Analysis Record*. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.

e. Long-term Maintenance and Management Fund. The Project owner shall deposit in NFWF's REAT Account a capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands.

   The BLM, in consultation with CDFW, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision.

f. *Interest, Principal, and Pooling of Funds*. The Project owner, BLM, and CDFW shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

   i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFW designed to protect or improve the habitat values of the compensation lands.

   ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFW or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFW takes fee title to the compensation lands, monies received by CDFW pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFW designates NFWF or another entity to manage the long-term maintenance and management fee for CDFW.

   iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFW, or a BLM- and CDFW-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the

compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFW.

g. *Other expenses*. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to: title and document review costs; expenses incurred from other state agency reviews; overhead related to providing compensation lands to CDFW or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.

h. *Mitigation Security*. The Project owner shall provide financial assurances to the BLM and CDFW with copies of the document(s) to the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the Project in the event the Project owner fails to comply with the requirements specified in this condition, or shall be returned to the Project owner upon successful compliance with the requirements in this condition. The BLM's or CDFW's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Financial assurance can be provided to the BLM and CDFW in the form of an irrevocable letter of credit, a pledged savings account, or another form of security ("Security"). Prior to submitting the Security to the BLM, the Project owner shall obtain the BLM's approval in consultation with CDFW and the USFWS of the form of the Security. The actual costs to comply with this condition will vary depending on the final footprint of the Project and the actual costs of acquiring, improving, and managing the compensation lands.

i. NFWF REAT Account. The Project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the Project owner shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than anticipated in the PAR analysis, the excess money deposited in the REAT Account shall be returned to the Project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the Project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the BLM and CDFW. Such delegation shall be subject to approval by the BLM and CDFW, in consultation with USFWS, prior to land acquisition, initial protection, or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of BLM's approval.

Mitigation Measure 3.4-3: Bighorn Sheep Habitat Connectivity. In addition to APM 75, which will provide two water sources to improve bighorn sheep habitat connectivity, this measure provides additional detail and requirements for the proposed water sources. To compensate for impacts to bighorn sheep habitat connectivity, the Applicant/Owner shall support CDFW's efforts to encourage connectivity of bighorn sheep populations between the south Soda Mountains, the north Soda Mountains, and the Avawatz Mountains, which are located further to the north of the Project site. More specifically, the Applicant/Owner shall provide funding for CDFW to install between three and five (total) pre-fabricated bighorn sheep water guzzlers in the north Soda Mountains/Avawatz Mountains corridor and provide funding to refill them through the life of the project. The Project owner shall consult with BLM and with the CDFW Desert Bighorn Sheep Program Coordinator to identify strategic locations for water sources to promote bighorn sheep migration through the north Soda Mountain range. Water sources will be situated in locations that: 1) facilitate use of existing 1-15 crossing sites at culverts and bridges; 2) are situated at key locations within the movement corridor; 3) are accessible using existing roads whenever possible for filling and maintenance; and 4) are situated outside of existing wilderness boundaries. The Project owner shall monitor and manage the artificial or restored water source for the benefit of bighorn sheep for the life of the Project, or shall provide sufficient funding to support such monitoring and management by an approved third party. At the end of the Project, CDFW shall have the option to retain and manage the water sources or have them removed by the Applicant/Owner during the decommissioning process.

Mitigation Measure 3.4-4: Avoid Disturbance to Nesting Birds. Vegetation clearing shall take place outside of the general avian breeding season (February 15 to September 1), when feasible. If vegetation clearing cannot occur outside the avian breeding season, the Designated Biologist/Biological Monitor(s) shall conduct a preconstruction survey for nesting birds no more than three (3) days prior to vegetation clearing. If no active nests are found, clearing can proceed. If active nests are found, no clearing shall be allowed within 150 feet (for passerines) to 250 feet (for raptors) of the active nests until the Designated Biologist determines the nest is no longer active or the nest fails. The Designated Biologist/Biological Monitor(s) shall submit the results of the pre-construction nesting bird surveys to the BLM, USFWS, and CDFW.

Mitigation Measure 3.4-5a: Minimize Vehicle and Equipment Impacts during Operation and Maintenance. The Applicant/Owner shall implement measures to minimize the potential for desert tortoise and other wildlife species mortality along access and maintenance roads. These measures shall include:

1. A speed limit of 15 miles per hour will be maintained on all dirt access/maintenance roads, and all vehicles must remain on designated access/maintenance roads.
2. Pedestrian access outside the limits of the designated access/maintenance roads is permitted year-round as long as no ground-disturbing activities take place.
3. Vehicle traffic and parking shall be confined to designated access roads, and equipment and materials staging areas shall be clearly defined to avoid impacting habitat during the operation phase.

Mitigation Measure 3.4-5b: Operation and Maintenance Education Program. A WEAP shall be implemented during the construction and operation phase of the Project to alert workers to the hazards posed by ongoing operations to common and special-status

wildlife species. The WEAP shall include the same program elements discussed in Mitigation Measure 3.4-1c.

3.4.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to wildlife resources would remain. The Proposed Action or any of the action alternatives would eliminate all habitat for wildlife within the Project site and would potentially affect wildlife movement and use of adjacent off-site habitat. Mitigation measures to avoid, minimize, or compensate for direct and indirect impacts would lessen the effects to varying, but unquantified degrees, but would not completely offset losses. Potential routes that could support irregular bighorn sheep movement though the Project site would become less attractive with the development of site facilities such that sheep may not traverse the Project area following construction. There is presently little estimated sheep movement (and no documented natural movement) between the south Soda Mountains, the north Soda Mountains, and the Avawatz Mountains, which are located further to the north of the Project site. Nonetheless, the potential for such movement exists and would be encouraged by the implementation of Mitigation Measure 3.4-3. This would offset, but would not fully avoid, potential Project impacts. Wildlife that move along solar array fences could be subject to increased vulnerability to predation. Gaps in fencing, if not properly maintained, could trap desert tortoises, badgers, kit foxes, or bighorn sheep, or funnel animals to I-15. In addition to direct loss of habitat, the Project would fragment and degrade adjacent native wildlife communities, promote the spread of invasive non-native plants, and increase the presence of desert tortoise predators such as ravens. The site provides habitat for foraging, cover, and/or breeding habitat for a variety of resident wildlife, including the state- and federally listed desert tortoise, as well as the American badger, desert kit fox, golden eagle, migratory birds, burrowing owl, and bighorn sheep; Project impacts to this habitat would not be offset completely by the implementation of mitigation measures. Recent construction monitoring results from the Genesis and Desert Sunlight facilities (see, e.g., Genesis Solar, LLC, 2013a, 2013b, 2013c; Ironwood Consulting, Inc., 2013a, 2013b) suggest that ongoing, unmitigated avian attraction, injury, and mortality risks would remain at the Project site while solar PV panels are in place. Such risks would not be effectively reduced by the implementation of mitigation measures.

3.4.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section IV, a project would have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Only those CEQA significance criteria related to wildlife resources, which include criteria d and f and wildlife-related aspects of criteria a and e are addressed in this section. Those criteria with aspects that pertain to vegetation and riparian resources, which include criteria b and c and vegetation-related aspects of criteria a and e, are analyzed in Section 3.3, *Biological Resources – Vegetation*.

3.4.10.1 Alternative A: Proposed Action

a) Impact Wild-1: The Proposed Action would have substantial adverse direct and indirect effects on desert tortoise. (Less than Significant with Mitigation Incorporated)

The desert tortoise would experience habitat losses, and individual tortoises could additionally be impacted by the Project. This would be a significant, adverse impact. The implementation of mitigation measures identified in Section 3.4.8 would avoid, minimize, and compensate for direct and indirect impacts to desert tortoise during construction. Protective measures for desert tortoise include compliance monitoring by a designated biologist (Mitigation Measure 3.4-1a), biological monitoring during construction (Mitigation Measure 3.4-1b), a WEAP (Mitigation Measure 3.4-1c), speed limits (Mitigation Measure 3.4-1d), specific desert tortoise protection measures (Mitigation Measure 3.4-2a), a Desert Tortoise Translocation Plan (Mitigation Measure 3.4-2b), verification of the desert tortoise compliance program (Mitigation Measure 3.4-1d), and compensatory mitigation for habitat losses (Mitigation Measure 3.4-2d). Following the implementation of these measures, impacts to desert tortoise would be less than significant. For the reasons discussion in Section 3.4.7, the Project's less-than-significant impacts to desert tortoise would not be cumulatively considerable.

Impact Wild-2: The Proposed Action would have substantial adverse indirect effects on Mojave fringe-toed lizard. (Less than Significant with Mitigation Incorporated)

Indirect effects to Mojave fringe-toed lizard would be minimized through implementation of APM 50 (IWMP) and Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP). Following the implementation of these measures, impacts to Mojave fringe-toed lizard would be less than

significant. For the reasons discussion in Section 3.4.7, the Project's less-than-significant impacts to Mojave fringe-toed lizard would not be cumulatively considerable.

Impact Wild-3: The Proposed Action could have substantial adverse direct and indirect effects on special-status birds. (Significant and Unavoidable)

Nesting Birds

Direct and indirect impacts may occur to nesting special-status birds in and near the Project site, including burrowing owl, golden eagle, loggerhead shrike and other birds that are protected by the MBTA and California Fish and Game code. These impacts would be minimized through implementation of APM 50 (IWMP) and Mitigation Measures 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP). Focused surveys and protection measures are proposed for burrowing owl (Mitigation Measure 3.4-1f) as well as for other nesting birds through the Bird and Bat Conservation Strategy (Mitigation Measure 3.4-1g). Additionally, Mitigation Measure 3.4-4 requires general preconstruction nesting bird surveys and avoidance measures. Following the implementation of these measures, impacts to nesting or foraging special-status birds would be less than significant. For the reasons discussion in Section 3.4.7, the Project's less-than-significant impacts to nesting special-status birds would not be cumulatively considerable.

Special-Status, Resident, and Migratory Birds

Several special-status birds (including Yuma clapper rail, brown pelican, and yellow-headed blackbird) and some common bird species protected under the Migratory Bird Treaty Act have been found injured or dead at large-scale solar project sites as reported in monitoring data for projects now under construction (CEC, 2013; Genesis Solar, LLC, 2012, 2013a, 2013b, 2013c; Ironwood Consulting, Inc., 2013a, 2013b). Direct and indirect impacts may occur to these birds during the construction phase that would continue through the operation and maintenance phase until solar panels and other infrastructure are removed during decommissioning. During all Project phases when panels are installed, the Project would produce reflected light and polarized light pollution that may attract birds to the Project site. The Avian Monitoring Program required by Mitigation Measure 3.4-1h is proposed to characterize the avian collision risk associated with the Project; however, it would not reduce the impacts of proposed facilities to individual birds to a less-than-significant level because avian collision risks would remain due to the presence of PV panels. Thus, this impact would remain significant and unavoidable following the implementation of Mitigation Measures 3.4-1g and 3.4-1h.

Impact Wild-4: The Proposed Action would have substantial adverse direct and indirect effects on desert kit fox and American badger. (Less than Significant with Mitigation Incorporated)

The Project's direct and indirect impacts to kit fox and American badger would be avoided and minimized by implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP). Following the implementation of these measures, impacts to desert kit fox and American badger would be less

than significant. For the reasons discussion in Section 3.4.7, the Project's less-than-significant impacts to these species would not be cumulatively considerable.

Impact Wild-5: The Proposed Action would have a substantial adverse effect on bighorn sheep. (Significant and Unavoidable)

The Project footprint has been modified since the initial proposal to reduce potential direct and indirect effects on bighorn sheep habitat availability, movement corridors, and behavior. The assessment by Bleich (2012) indicates that the presence of Project facilities could reduce occasional, intermittent foraging by sheep in low-lying foraging areas adjacent to mountains. Upon reviewing this and other information on seasonal sheep foraging habitat requirements, the BLM required and the Applicant/Owner agreed to a 0.25-mile setback from the site's 20 percent slope contours. This adjustment reduced the size of the South and East arrays and provided a buffer between potential seasonal sheep foraging areas and the Project site boundary.

However, even with the Project boundary revision, sheep could avoid or modify their use of low-lying areas adjacent to slopes near the Project site. The base of the mountains located east of the East Arrays, for example, support a large seasonal wash that may provide seasonal foraging opportunities, particularly for females and lambs. While researchers have found that nutrition can affect both birthing rates and future recruitment of the population, it is reasonable to suggest that near-slope foraging habitat would remain available following Project construction and to conclude that the Project would not directly adversely affect sheep survival.

Project-caused habitat modifications could have a significant effect on behavior and habitat use, including the ability or willingness of sheep to cross I-15 and move within or through the Project site. Other movement opportunities near Zzyzx Road would remain unchanged.

The Project would negatively impact the ability to reestablish bighorn sheep connectivity across I-15 in the Soda Mountains. The only portions of the Project ROW where bighorn sheep presently can cross I-15 safely are at highway underpasses or overpasses. Multiple large culvert underpasses would become less accessible to sheep following Project implementation. This would be a significant impact that would be reduced somewhat by the Applicant/Owner's implementation of APM 75, which would result in the addition or restoration of water sources to increase sheep survivorship and movement, and further reduced by the implementation of Mitigation Measure 3.4-3, which would impose additional requirements for such water sources. However, these actions would not reduce the impact to a less-than-significant level. Following the implementation of Mitigation Measure 3.4-3, Project-level impacts to bighorn sheep habitat availability and movement would remain significant and unavoidable.

Impact Wild-6: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on bighorn sheep. (Significant and Unavoidable)

For the reasons discussion in Section 3.4.7, the Project's significant and unavoidable impact to bighorn sheep also would be cumulatively considerable. As noted above, construction of the XpressWest High Speed Passenger Rail Project and Calnev Pipeline Expansion Project adjacent

to I-15 would further diminish the quality of the bighorn sheep movement corridor in the Soda Mountains. The cumulative effect to bighorn sheep of those projects considered together with the Project would be significant and unavoidable, and the Project's contribution would be cumulatively considerable.

Impact Wild-7: The Proposed Action would have a substantial adverse effect on special-status bats. (Less thanSignificant with Mitigation Incorporated)

Direct and indirect impacts to special-status bats would be reduced to less than significant through implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), 3.4-1c (WEAP), 3.4-1e (lighting specifications to minimizes bird and bat impacts), and 3.4-1g (Bird and Bat Conservation Strategy).

There is a possibility that the Project could disrupt nighttime bat foraging activities beginning when the solar PV panels are installed and concluding when they are removed from the site as a potential consequence of the effects of reflective and polarized PV panel surfaces described above. Recent research indicates that the echo-reflection properties of smooth, horizontal objects can lead bats to mistake such objects for water, as demonstrated by repeated attempts to drink from such objects (Greif and Siemers, 2010). By comparison, textured objects do not elicit drinking behavior (Id.). Bats that attempt to drink from smooth PV panels could be more likely to collide with Project infrastructure; however, no collisions were observed during experiments (Id.) and it may be the exhaustion resulting from bats' apparent inability to learn from initial drinking attempts in the lab could pose the greater danger. Other recent research indicates that bats may learn from context to avoid non-water surfaces in situations where water is available as an alternative (Russo et al., 2012).

There also is a possibility that the reflective surfaces of PV panels could attract insects if the insects mistake the panels for water, and thereby create a concentrated food source for bats. See, for example, Horvath et al. (2009) and Horvath et al. (2010), which suggest that many insects are sensitive to polarized light pollution and consequently are attracted to PV panels. This could pose a greater collision risk to bats when feeding; however, most bats use echolocation to locate their prey and successfully avoid other objects.

Implementation of Mitigation Measure 3.4-1g, Bird and Bat Conservation Strategy, and Mitigation Measure 3.4-1h, Avian Monitoring Program, would reduce, but not avoid, potential impacts to special-status bats. Additional mitigation, such as making water available as an alternative, would be required to reduce the risk to special-status bats below established significance thresholds. However, the creation of a water source on or near the Project site could be an attractant to other wildlife and thereby cause significant adverse impacts to additional species. Because few bat fatalities have been documented at existing solar facilities, the level of risk to special-status bats is considered low. Thus, a low level of potential risk would remain to special-status bat species during Project operation and maintenance.

The Proposed Action would not have a substantial adverse effect, either directly or through habitat modifications, on Mojave tui chub. (No Impact)

No impact would occur to Mojave tui chub because the groundwater aquifer that supports this species is not known to be hydrologically connected to the Soda Mountain Valley aquifer. No impact is anticipated, as groundwater monitoring that is proposed in APMs 14 through 18 and Mitigation Measure 3.19-4 would verify that the Project would not detrimentally affect flows at Soda Spring.

d) Impact Wild-8: Project operation and maintenance-related interference with the movement of migratory birds though existing migratory corridors. (Less than Significant)

As discussed in Impact Wild-3, monitoring data from other projects increasingly suggests that solar energy generation technologies including PV produce reflected light and polarized light that may attract resident and migratory birds to solar facilities, and could contribute to injury and mortality related to collision with PV panels and other Project structures. As avian monitoring efforts continue, additional data will be generated that could help to characterize the scale of the bird attraction issue and adaptive management strategies could spur technological advances that avoid or reduce avian mortality and injury at solar project sites.

Also as discussed above, the numbers and species of birds that could be attracted to the Project site during the operation and maintenance phase cannot be known with certainty. While preliminary monitoring data suggest that individual birds may be attracted to the solar PV facilities and thereby be subject to injury or fatality, no evidence indicates that solar PV facilities interfere with local bird movement or migratory patterns. Thus, Project effects to bird movement and migratory corridors would be less than significant.

Impact Wild-9: The Proposed Action would interfere with the movement of bighorn sheep through existing migratory corridors. (Significant and Unavoidable)

As discussed above, APM 75 and Mitigation Measure 3.4-3 would reduce the significance of the Project's impact to sheep movement, but not to a less-than-significant level. The Project, individually and cumulatively, would have a significant and unavoidable impact on regional bighorn sheep movement.

With the exception of bighorn sheep, the Project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) The Proposed Action would not conflict with any local policies and ordinances that protect biological resources. (No Impact)

The Project is proposed on BLM-administered public land. No local policies or ordinances protecting biological resources apply to the Project. Therefore, the Project would have no impact on such policies or ordinances, and could not cause or contribute to any cumulative effect in this regard.

f) The Proposed Action would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. (No Impact)

The Project is not proposed within the boundaries of any adopted habitat conservation plan; natural community conservation plan; or other approved local, regional, or state habitat conservation plan. No such plan has been adopted within the vicinity of the Project site. Therefore, the Project would have no impact on such a plan, and could not cause or contribute to any cumulative effect in this regard.

3.4.10.2 Alternative B

CEQA significance for Alternative B would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to effects to candidate, sensitive, or special-status species. Similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact on bighorn sheep movement. Significant unavoidable impacts would occur to avian species, including potential mortality and injury to special-status birds (such as the federally and state endangered Yuma clapper rail, brown pelican, and yellow-headed blackbird) and some common bird species protected under the Migratory Bird Treaty Act, associated with the presence of PV panels as described for the Proposed Action. The impact would be significant and unavoidable at the Project- or alternative-specific level as well as cumulatively. Like the Project, Alternative B would be consistent with all local policies and ordinances that protect biological resources and would have no impact to any adopted habitat conservation plan or natural community conservation plan.

3.4.10.3 Alternative C

CEQA significance for Alternative C would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to effects to candidate, sensitive, or special-status species. Similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact on bighorn sheep movement. Similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact related to avian collision risks with Project facilities. Like the Project, Alternative C would be consistent with all local policies and ordinances that protect biological resources and would have no impact to any adopted habitat conservation plan or natural community conservation plan.

3.4.10.4 Alternative D

CEQA significance for Alternative D would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to effects to candidate, sensitive, or special-status species. Similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact on bighorn sheep movement. Also similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact related

to avian collision risks with Project facilities. Like the Project, Alternative D would be consistent with all local policies and ordinances that protect biological resources and would have no impact to any adopted habitat conservation plan or natural community conservation plan.

3.4.10.5 Alternative E: No Action/No Project

Because it would result in no development of the Project site, Alternative E would result in no direct or indirect impact to wildlife resources, and would not cause or contribute to any cumulative impact to wildlife resources.

3.4.10.6 Alternative F: CEQA No Project

CEQA significance for Alternative F would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to effects to candidate, sensitive, or special-status species. Similar to Alternative A, this alternative would cause a significant and unavoidable impact and significant and unavoidable contribution to a cumulative impact on bighorn sheep movement. Like the Project, Alternative F would be consistent with all local policies and ordinances that protect biological resources and would have no impact to any adopted habitat conservation plan or natural community conservation plan. The transportation of water to the site for the Project would not affect the significance determinations for potential impacts to wildlife.

3.4.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Because no ROW grant and no groundwater well permit for the Project would be authorized under this alternative, Alternative G would result in no direct or indirect impact to wildlife resources, and would not cause or contribute to any cumulative impact to wildlife resources.

References

Abella. R., 2012. Memorandum entitled, “May 1 Bighorn Sheep Ground Count in the South Soda Mountains.” State of California Department of Fish and Game, May 14, 2012.

Averill-Murray, R.C., 2002. Effects on survival of desert tortoises (*Gopherus agassizii*) urinating during handling. Chelonian Conservation and Biology 4(2): 430-435.

Averill-Murray, R.C. and A. Averill-Murray, 2005. Regional-Scale Estimation of Density and Habitat Use of the Desert Tortoise (*Gopherus agassizii*) in Arizona, Journal of Herpetology, Vol. 39, No. 1, pp. 65–72.

Avian Power Line Interaction Committee (APLIC), 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, ADLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

APLIC, 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

Berry, K.H., 1986. Desert tortoise (*Gopherus agassizii*). Relocation: implications of social behavior and movements. Herpetologica 42:113-125.

Bernath, B., G. Szedenics, G. Molnar, G. Kriska, and G. Horvath, 2001. Visual Ecological Impact of a Peculiar Waste Oil Lake on the Avifauna: Dual-choice Field Experiments with Water-seeking Birds Using Huge Shiny Black and White Plastic Sheets. Archives of Nature Conservation and Landscape Research 40:87–107.

BioResources Consultants, Inc., 2011. Golden Eagle Nest Surveys and Desert Bighorn Sheep Observations (March 21-25, 2011 and May 9-10, 2011) Soda Mountain Solar Project. Submitted to Caithness Soda Mountain, LLC, August 1, 2011

Black, J.H., 1976. Observations on courtship behavior of the desert tortoise. Great Basin Naturalist 36:467-470.

Bleich et al., 1996. Metapopulation theory and mountain sheep: implications for conservation. Pp. 353-373, In: D.R. McCullough, (ed.) Metapopulations and wildlife conservation management. Island Press, Washington, D.C.

Bleich, V. C., R. T. Bowyer, and J. D. Wehausen. 1997. Sexual segregation in mountain sheep: resources or predation? Wildlife Monographs 134:1-50.

Bleich, V.C., 2012. Comments Regarding the South Soda Mountains Solar Project as Related to The Desert Renewable Energy Conservation Plan, Prepared for Regina Abella, California Department of Fish and Game, August 26, 2012.

Boarman, W.I., 1993. When a native predator becomes a pest: a case study, In: Majumdar, S.K., E.W. Miller, D.E. Baker, E.K. Brown, J.R. Pratt, and R.F. Schmaltz (ed). Conservation and Resource Management, Chapter 13, pp. 191-206, The Pennsylvania Academy of Science.

Boarman, W.I., 2002. Threats to desert tortoise populations: A critical review of the literature. U.S. Geological Survey, Western Ecological Research Center, Sacramento, California.

Brown-Berry Biological Consulting, 2012. Bat Habitat Assessment for Bechtel Soda Mountain Solar Project, San Bernardino County, California. Prepared for Panorama Environmental, Inc., Nov. 18, 2012.

Bureau of Land Management (BLM), 1999. California Desert Conservation Area (CDCA) Plan of 1980, as amended through 1999.

BLM, 2008. Manual 6840 – Special Status Species Management. December. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.43545.File.dat/6840.pdf]

BLM, 2012. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/ Environmental Impact Report. Prepared by the U.S. Department of Interior, Bureau of Land Management and County of San Bernardino, March, 2012.

BLM, County of San Bernardino, and City of Barstow (BLM), 2005. Final Environmental Impact Report and Statement for the West Mojave Plan, Volume 1. [http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf]

Caithness Soda Mountain, LLC, 2010a. Final 2009 Biological Resources Technical Report, Soda Mountain Solar Project, San Bernardino County, CA (October).

Caithness Soda Mountain, LLC, 2010b. Final 2009 Desert Tortoise Survey Report, Soda Mountain Solar Project, San Bernardino County, California (October).

Caithness Soda Mountain, LLC, 2010c. Final 2009 Mojave Fringe Toed Lizard Survey Report, Soda Mountain Solar Project, San Bernardino County, California (October).

Caithness Soda Mountain, LLC, 2010d. Final 2009 Spring and Fall Avian Survey Report, Soda Mountain Solar Project, San Bernardino County, California (October).

California Burrowing Owl Consortium (CBOC), 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. [http://www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf]

California Department of Fish and Wildlife (CDFW), 2013. California Natural Diversity Database (CNDDB), Rarefind 4. CDFG's Electronic database, Sacramento, California. Data search for the following 7.5 minute USGS Quadrangles: West of Soda Lake and surrounding 8 quadrangles and San Bernardino County.

California Department of Fish and Game (CDFG), 2008a. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California (Brown Pelican).

CDFG, 2008b. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California (Yellow-Headed Blackbird).

CDFG, 2012. Staff Report on Burrowing Owl Mitigation, State of California Natural Resources Agency, Department of Fish and Game, March 7, 2012.

California Energy Commission, 2013. RE: Blythe Solar Power Project Amendment (09-AFC-6C) Data Request Set No. 2 (Nos. 20–25), July 12, 2013.

Cornell Lab of Ornithology, 2013. Brown Pelican, Life History. [http://www.allaboutbirds.org] Accessed October 16, 2013.

Dudek and ICF International, 2012. Draft Desert Renewable Conservation Plan Species Account: Yuma Clapper Rail (*Rallus longirostris yumanensis*).

Epps, C.W., J.D. Wehausen, R.J. Monello, and T.G. Creech, 2013. Potential impacts of proposed solar energy development near the South Soda Mountains on desert bighorn sheep connectivity, Report to the California Department of Fish and Wildlife, National Park Service, and Bureau of Land Management, 25, February.

Federal Railroad Administration (FRA), 2011. Final Environmental Impact Statement and Final Section 4(f) Evaluation for the Proposed DesertXpress High-Speed Passenger Train Victorville, California to Las Vegas, Nevada. U.S. Dept. of Transportation, Federal Railroad Administration, March.

Genesis Solar, LLC, 2013a. Genesis Solar Energy Project Eastern Riverside County, California, Monthly Compliance Report #33 [to the California Energy Commission]. July 2013.

Genesis Solar, LLC, 2013b. Genesis Solar Energy Project Eastern Riverside County, California, Monthly Compliance Report #34 [to the California Energy Commission]. August 2013.

Genesis Solar, LLC, 2013c. Genesis Solar Energy Project Eastern Riverside County, California, Monthly Compliance Report #35 [to the California Energy Commission]. September 2013.

Gervais, J. A., D. K. Rosenberg, and L.A. Comrack, 2008. Burrowing Owl (*Athene cunicularia*). In. Shuford, W. D., and Gardali, T., eds. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Greif, S. and B. M. Siemers, 2010. Innate recognition of water bodies in echo-locating bats. Nature Communications, 1:107, DOI: 10.1038/ncomms1110. [http://www.nature.com/ncomms/journal/v1/n8/pdf/ncomms1110.pdf]

Griffiths, P.G., R.H. Webb, N. Lancaster, C.A. Kaehler, and S.C Lundstrom, 2002. Long-Term Sand Supply to Coachella Valley Fringe-Toed Lizard (*Uma inornata*) Habitat in the Northern Coachella Valley, California. U.S. Geological Survey, Water-Resources Investigations Report 02-4013, Tucson, Arizona 2002, Prepared in cooperation with the U.S. Fish and Wildlife Service.

Harless, M.L., A.D. Walde, D.K. Delaney, L.L. Pater, and W.K. Hayes, 2010. Sampling Considerations for Improving Home Range Estimates of Desert Tortoises. Effects of Estimator, Sampling Regime and Sex, Herpetological Conservation and Biology 5(3):374–387, December 2010.

Henen, B.T., C.D. Peterson, I.R. Wallis, K.H. Berry, and K.A. Nagy, 1998. Effects of climatic variation on field metabolism and water relations of desert tortoises. Oecologia 117:365-373.

Horvath, G., G. Kriska, P. Malik, and B. Robertson, 2009. Polarized light pollution: a new kind of ecological photopollution. Frontiers in Ecology and the Environment, DOI:10.1890/ 080129.

Horvath G., M. Blaho, A. Egri, G. Kriska, I. Seres, and B. Robertson, 2010. Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. Conservation Biology 6:1644–1653. [http://news.msu.edu/media/documents/2010/05/0ef11236-7810-48fb-a494-1da62fa2ebdd.pdf]

Humple, D., 2008. Loggerhead Shrike (*Lanius ludovicianus*). In. Shuford, W. D., and Gardali, T., eds. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Ironwood Consulting, Inc., 2012. 2012 Annual Report for Biological Resources Monitoring First Solar Desert Sunlight Solar Project, Riverside County BLM Case File Number CACA-48649 Biological Opinion# FWS-ERIV-08B0789-11F0041, 1 January – 31 December 2012.

Ironwood Consulting, Inc., 2013a. Desert Sunlight Solar Project Weekly Progress Report: Biological Resources. Desert Center, California. October 7 - October 13, 2013.

Ironwood Consulting, Inc., 2013b. Desert Sunlight Solar Project Weekly Progress Report: Biological Resources. Desert Center, California. October 28 - November 3, 2013.

Kiva Biological Consulting, 2013a. Protocol Desert Tortoise Survey for Soda Mountain Solar Project, Spring 2013. BLM Case Number – CACA 49584, Prepared for: Bureau of Land Management June 12, 2013.

Kiva Biological Consulting, 2013b. Preliminary raw burrowing owl survey data provided to BLM on July 1, 2013.

Kochert, M.N., K. Steenhof, C.L. Mcintyre, and E.H. Craig, 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America. [http://bna.birds.cornell.edu/bna/species/684].

Murphy, R. W., T. L. Trepanier, and D. J. Morafka, 2006. Conservation genetics, evolution and distinct population segments of the Mojave fringe-toed lizard, *Uma scoparia*. Journal of Arid Environments 67 (Supplement S), pp. 226-247.

Norris, K. S., 1958. The evolution and systematics of the iguanid genus Uma and its relation to the evolution of other North American desert reptiles. Bull. Amer. Mus. Nat. Hist. 114, pp. 247-328.

Pagel, J.E., D.M. Whittington, and G.T. Allen, 2010. *Interim Golden Eagle technical guidance: inventory and monitoring protocols; and other recommendations in support of eagle management and permit issuance*. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

Panorama Environmental, Inc., 2012. Analysis of Habitat Suitability and Connectivity in the Soda Mountain Area, San Bernardino County, California, July 2012.

Panorama Environmental, Inc. 2013a. Biological Resources Technical Report, Soda Mountain Solar San Bernardino County, CA, BLM Case Number CACA 49584, March 2013.

Panorama Environmental, Inc., 2013b. Bighorn Sheep Survey Results and Analysis, Soda Mountain Solar Project, BLM Case No. CACA-49584, *July*.

Panorama Environmental, Inc., 2013c. Draft Bird and Bat Conservation Strategy, Soda Mountain Solar San Bernardino County, CA BLM Case Number CACA 49584, June 2013.

Panorama Environmental, Inc., 2013d. Desert Tortoise Translocation Plan, Soda Mountain Solar San Bernardino County, CA BLM Case Number CACA 49584, June 2013.

Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer, and S. Morrison, 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. [http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html] Accessed November 4, 2013.

Ralph, C.J., et al., 1995. Managing and monitoring birds using point counts: Standards and Applications. In: Monitoring Bird Populations by Point Counts (C.J. Ralph, S. Droege, and J.R. Sauer, technical editors) PSW-GTR-149. U.S. Department of Agriculture, Forest Service. Albany, CA.

Russo, D., L. Cistrone, and G. Jones, 2012. Sensory Ecology of Water Detection by Bats: A Field Experiment. [http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0048144] Accessed November 4, 2013.

San Bernardino County, 2007. San Bernardino County General Plan., Adopted March 13, 2007, Amended June 18, 2013.

Tesky, Julie L., 1994. *Aquila chrysaetos*. In: *Fire Effects Information System*, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.

U.S. Fish and Wildlife Service (USFWS), 1992. Field Survey Protocol for Any Federal Action That May Occur within the Range of the Desert Tortoise. January 1992. Ventura, CA.

USFWS, 1994. Desert Tortoise (Mojave population) Recovery Plan. Portland, Oregon. 73 pages plus appendices.

USFWS, 2000. Recovery plan for bighorn sheep in the Peninsular Ranges, California. U.S. Fish and Wildlife Service, Portland, OR. xv+251 pp.

USFWS, 2009a. Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*), April 2009. Ventura, CA.

USFWS, 2009b. Final Environmental Assessment Proposal to Permit Take Provided Under the Bald and Golden Eagle Protection Plan Act, Department of the Interior, U.S. Fish and Wildlife Service, Washington D.C. (April, 2009).

USFWS, 2009c. Desert Tortoise Science Advisory Committee Meeting, Meeting Summary, U.S. Fish and Wildlife Service Desert Tortoise Recovery Office, Reno, Nevada, March 13, 2009.

USFWS, 2009d. Desert Tortoise (Mojave Population) Field Manual (*Gopherus agassizii*). U.S. Fish and Wildlife Service, December 2009.

USFWS, 2010. Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*), 2010 Field Season. Ventura, CA.

USFWS, 2011a. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

USFWS, 2011b. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Amargosa River Population of the Mojave Fringe-Toed Lizard as an Endangered or Threatened Distinct Population Segment. Fed. Reg Vol. 76, No. 192, (October 4, 2011).

USFWS, 2012. Guidance for Preparing a Biological Assessment. [http://www.fws.gov/midwest/endangered/section7/pdf/BAGuidance.pdf]

USFWS, 2013. Endangered Species Program, Consultations, Frequently Asked Questions website. Online at: http://www.fws.gov/endangered/what-we-do/faq.html

Wehausen, J.D., 2006. Nelson Bighorn Sheep. West Mojave Plan Species Accounts. U.S. Department of the Interior, Bureau of Land Management. January 2006. http://www.blm.gov/ca/pdfs/cdd_pdfs/Bighorn1.PDF.

Wehausen, J. D., 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pages 37-50 in J. Goerrissen and J. M. Andre, editors. Sweeney Granite Mountains Desert Research Center 1978-2003.

Weisenberger, M.E., P.R. Krausman, M.C. Wallace, D.W. De Young, and O.E. Maughan, 1996. Effects of Simulated Jet Aircraft Noise on Heart Rate and Behavior of Desert Ungulates. Journal of Wildlife Management, Volume 60, Number 1: 52-61.

Western Bat Working Group (WBWG), 2005. Online species accounts for pallid bat and Townsend's big-eared bat, http://www.wbwg.org/; Accessed on July 1, 2013.

Yosef, R., 1996. Loggerhead Shrike (*Lanius ludovicianus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. [http://bna.birds.cornell.edu/bna/species/231 doi:10.2173/bna.231] Accessed December 7, 2011.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds., 1990. California's Wildlife. Vol. III, Mammals. California Depart. of Fish and Game, Sacramento, California. California Wildlife Habitat Relationship System (CWHRS).

3.5 Climate Change

3.5.1 Introduction

This section describes and evaluates issues related to climate change and greenhouse gas (GHG) emissions in the context of the Proposed Action and alternatives. An overview of climate change is provided, followed by a discussion of the various GHGs that have been identified as drivers of climate change, the regulatory setting, the analytical methodology for the analysis, the direct and indirect effects of the Proposed Action and alternatives, cumulative effects, and CEQA significance thresholds and determinations for the Proposed Action and alternatives. Several comments were received during the scoping process for the PA/EIS/EIR requesting that the analysis include quantitative estimates of GHG emissions and impacts on carbon sequestration, as well as describe the potential effects of climate change on the Project (see Appendix B).

3.5.2 Regional and Local Environmental Setting

3.5.2.1 Climate Change

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Some of the potential effects of global warming in California may include loss of snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large wildfires, and more drought years (CARB, 2009). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2007):

1. Higher maximum temperatures and more hot days over nearly all land areas;
2. Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
3. Reduced diurnal temperature range over most land areas;
4. Increase of heat index over land areas; and
5. More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

3.5.2.2 Greenhouse Gases

The generation of electricity can produce GHGs in addition to the criteria air pollutants that traditionally have been regulated under the federal and state CAAs. For traditional sources of electricity, such as fossil fuel-fired power plants, GHG emissions include primarily carbon dioxide (CO_2), with much smaller amounts of nitrous oxide (N_2O), and methane (CH_4) primarily from unburned natural gas). Other sources of GHG emissions include sulfur hexafluoride (SF_6) from high voltage power equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because these different GHGs have different warming potential (i.e., the amount of heat trapped by a certain mass of a GHG), and CO_2 is the most common reference gas for climate change, GHG emissions often are quantified and reported as CO_2 equivalents (CO_2e). For example, SF_6, while representing a small fraction of the total GHGs emitted annually worldwide, is a very potent GHG with 23,900 times the global warming potential of the same mass of CO_2. Therefore, an emission of one metric ton of SF_6 would be reported as an emission of 23,900 metric tons CO_2e. Large emission sources are reported in million metric tons[1] of CO_2e.

GHG emissions from the electricity sector are dominated by CO_2 emissions from carbon-based fuels. Other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds that have very high global warming potentials. These air pollutants are considered to be GHGs because their presence in the atmosphere results in increased solar absorbance, and/or prevents heat from the surface of the Earth from escaping to space. The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

Carbon Dioxide (CO_2)

CO_2 is a naturally occurring gas that enters the atmosphere through natural as well as anthropogenic sources. Key anthropogenic sources include the burning of fossil fuels (e.g., oil, natural gas, coal, etc.), solid waste, trees, wood products, and other biomass; and industrially relevant chemical reactions such as those associated with manufacturing cement. CO_2 is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH_4)

Like CO_2, CH_4 is emitted from both natural and anthropogenic sources. Key anthropogenic sources of CH_4 include gaseous emissions from landfills, releases associated with mining and materials extraction industries (in particular coal mining), and fugitive releases associated with the extraction and transport of natural gas and crude oil. CH_4 emissions also result from livestock and agricultural practices. Small quantities of CH_4 are released during fossil fuel combustion.

Nitrous Oxide (N_2O)

N_2O also is emitted from both natural and anthropogenic sources. Important anthropogenic source activities include industrial activities, agricultural activities (primarily application of nitrogen fertilizer), the use of explosives, combustion of fossil fuels, and decay of solid waste.

[1] A metric ton is 1,000 kilograms; it is equal to approximately 1.1 U.S. tons and approximately 2,204.6 pounds.

Fluorinated Gases

HFCs, PFCs, and SF_6 are synthetic gases that are emitted from a variety of industrial processes and contribute substantially more by mass to the greenhouse effect than the GHGs described previously. Fluorinated gases often are used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases typically are emitted in small quantities, but because they are potent GHGs, they sometimes are referred to as high global warming potential gases.

Greenhouse Gas Sources

Anthropogenic GHG emissions in the United States derive mostly from the combustion of fossil fuels for transportation and power production. Energy-related CO_2 emissions, resulting from fossil fuel exploration and use, account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half of the energy-related emissions come from large stationary sources such as power plants; approximately a third derive from transportation; while industrial processes, agriculture, forestry, other land uses, and waste management compose a majority of the remaining sources (USEPA, 2013a).

Statewide emissions of GHG from relevant source categories for 2004 through 2010 are summarized in Table 3.5-1. Specific contributions from individual air basins such as the MDAB are included in the emissions inventory, but are not itemized by air basin. In 2010, California produced 451.6 million gross metric tons of CO_2e emissions. Transportation was the source of 38 percent of the state's GHG emissions, followed by electricity generation at 21 percent, industrial sources at 19 percent, residential sources at 10 percent, and other sources comprising the remaining 12 percent (CARB, 2013a).

TABLE 3.5-1
CALIFORNIA GREENHOUSE GAS EMISSIONS (million metric tons CO_2e)

Emission Inventory Category	2004	2005	2006	2007	2008	2009	2010
Transportation	183.5	186.3	187.0	187.4	178.2	173.3	173.2
Electric Power	116.3	108.9	105.6	115.0	121.2	103.6	93.3
Commercial and Residential	42.8	41.2	41.9	42.1	42.4	42.6	43.9
Industrial	97.0	96.0	94.3	91.9	94.3	83.6	86.0
Recycling and Waste	6.3	6.7	6.8	6.7	6.9	6.9	7.0
High Global Warming Potential	13.3	13.9	14.3	14.3	14.4	14.8	15.7
Agriculture	33.2	33.5	34.6	33.44	34.3	32.8	32.5
Forestry	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Gross Emissions	**492.6**	**486.7**	**484.4**	**490.9**	**491.9**	**457.8**	**451.6**

SOURCE: CARB, 2013a.

In California, renewable electricity sources have been given preference over fossil fuel-fired electricity sources. This means that when renewable energy is available on the grid, the California Independent Systems Operator (CAISO) requests turndown of fossil power production. When the renewable facility goes off-line, if there is still demand, the CAISO requests turn-up of fossil power production. Some fossil fuel load-following plants will adjust automatically as renewable sources come on- and off-line. As a result of these operating scenarios, new renewable energy power plants operating in California offset the production of electricity from fossil fuel-fired power plants.

Existing Greenhouse Gas Emissions at the Project Site

No industrial, residential, or other emitters of GHGs currently are located or operating at the Project site. There are no other existing on-site operations that result in the combustion of fossil fuel, or otherwise result in direct anthropogenic emissions of GHGs on-site. There is, however, existing desert ecosystem located on-site, and this ecosystem provides ongoing natural carbon uptake. Wohlfahrt et al. (2008) completed an evaluation of carbon uptake by a natural Mojave Desert ecosystem. The study indicates that desert ecosystems may result in the uptake of carbon in amounts as high as 102 to 110 grams per square meter per year (g/m^2yr); however, the study showed a high degree of uncertainty around these amounts. Other studies have indicated lower carbon uptake amounts for desert habitats, including between 10 and 30 g/m^2yr, 46 g/m^2yr, 70 g/m^2yr, and 72 g/m^2yr (Schlesinger, et al., 2009). Given the high variability of carbon uptake amounts identified in the scientific literature, this analysis assumes that on-site ecosystems could uptake carbon at a rate of 63 g/m^2yr based on the average of the carbon uptake rates discussed above. Under existing conditions, this would equate to a natural carbon uptake, expressed in CO_2, of approximately 0.93 metric tons of CO_2 per acre per year.

3.5.3 Applicable Laws, Regulations, Plans, and Standards

3.5.3.1 Federal

U.S. Environmental Protection Agency (USEPA)

On April 2, 2007, in *Massachusetts v. USEPA*, 549 US 497, the Supreme Court found that GHGs are air pollutants covered by the CAA. The Court held that the USEPA must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the USEPA is required to follow the language of Section 202(a) of the CAA.

On April 17, 2009, the USEPA Administrator signed proposed “endangerment” and “cause or contribute” findings for GHGs under Section 202(a) of the CAA. The USEPA held a 60-day public comment period, considered public comments, and issued final findings. The USEPA found that six GHGs taken in combination endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under CAA Section 202(a) (USEPA, 2013b).

Specific GHG regulations that the USEPA has adopted to date are as follows:

40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule. This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year (USEPA, 2013c). The Project would not trigger GHG reporting as required by this regulation.

40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. USEPA has mandated that Prevention of Significant Deterioration (PSD) and Title V requirements applies to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2013b). The Project would not trigger PSD or Title V permitting under this regulation.

3.5.3.2 State

Executive Order S-3-05

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006, and establishes statewide emission reduction targets through the year 2050 as follows:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

This Executive Order does not include any specific requirements that pertain to the Project; however, future actions taken by the state to implement these goals may affect the Project, depending on the specific implementation measures that are developed.

Senate Bill 1368

California Senate Bill (SB) 1368 was enacted in 2006, and required the California Public Utilities Commissions (CPUC) to establish a CO_2 emissions standard for base load generation owned by or under long-term contract with publicly owned utilities. The CPUC established a GHG Emissions Performance Standard (EPS) of 1,100 pounds of CO_2 per megawatt-hour (MWh). SB 1368 also requires the posting of notices of public deliberations by publicly owned companies on the CPUC website and establishes a process to determine compliance with the EPS. The Project, as a renewable energy generation facility, is determined by rule to comply with the GHG EPS requirements of SB 1368.

Assembly Bill 32

California Assembly Bill (AB) 32, also known as the Global Warming Solutions Act of 2006, requires CARB to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. AB 32 required CARB to adopt regulations that identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions, and CARB is authorized to enforce compliance with the program. Under AB 32, CARB also was required to adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. CARB established this limit in December 2007 at 427 million

metric tons of CO_2e. This is approximately 30 percent below forecasted "business-as-usual" emissions of 596 million metric tons of CO_2e in 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2009).

Toward achieving the maximum technologically feasible and cost-effective GHG emission reductions, AB 32 permits the use of market-based compliance mechanisms and requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts. CARB has adopted nine Early Action Measures for implementation, including Ship Electrification at Ports, Reduction of High Global-Warming-Potential Gases in Consumer Products, Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency), Reduction of Perfluorocarbons from Semiconductor Manufacturing, Improved Landfill Gas Capture, Reduction of Hydroflourocarbon-134a from Do-It-Yourself Motor Vehicle Servicing, Sulfur Hexaflouride Reductions from the Non-Electric Sector, a Tire Inflation Program, and a Low Carbon Fuel Standard.

Climate Change Scoping Plan

In December 2008, CARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit. The Scoping Plan estimates a reduction of 174 million metric tons CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors, and proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan expanded the list of the nine Early Action Measures into a list of 39 Recommended Actions contained in Appendices C and E of the Scoping Plan (CARB, 2009). Of these measures, the three that are relevant to the Project are presented in Table 3.5-2. The Scoping Plan must be updated every five years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. CARB has initiated activities to update the AB 32 Scoping Plan and expects to present an updated Scoping Plan for its Board to consider in November 2013 (CARB, 2013b).

TABLE 3.5-2
RELEVANT RECOMMENDED ACTIONS OF CLIMATE CHANGE SCOPING PLAN

ID #	Sector	Strategy Name and Description
T-7	Transportation	***Heavy Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)*:** This measure would require existing trucks/trailers to be retrofitted with the best available technology and/or CARB approved technology that may include devices that reduce aerodynamic drag and rolling resistance. This measure would require in-use trucks and trailers to comply through a phase-in schedule starting in 2010 and achieve 100 percent compliance by 2014.
E-3	Electricity and Natural Gas	***Renewables Portfolio Standard (RPS)*:** requires investor-owned utilities, community choice aggregators, and electricity service providers to increase the percentage of renewable resources in their retail portfolios. The most current RPS requires 33 percent of total procurement to be from eligible renewable energy resources by 2020.
H-6	High Global Warming Potential (GWP) Gases	***High GWP Reductions from Stationary Sources:*** The SF_6 Leak Reduction and Recycling in Electrical Applications element of this action reduces emissions of SF_6 within the electric utility sector and at particle accelerators by requiring the use of best achievable control technology for the detection and repair of leaks, and the recycling of SF_6.

SOURCE: CARB, 2009

Senate Bill 97

In 2007, the California State Legislature passed SB 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The amendments took effect March 18, 2010. The amendments added Section 15064.4 to the CEQA Guidelines, specifically addressing the potential significance of GHG emissions. Section 15064.4 neither requires nor recommends a specific analytical methodology or quantitative criteria for determining the significance of GHG emissions. Rather, the section calls for a "good faith effort" to "describe, calculate or estimate" GHG emissions and indicates that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would:

- Increase or reduce GHG emissions;
- Exceed a locally applicable threshold of significance; or
- Comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

The CEQA Guidelines also state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 Cal. Code Regs. §15064(h)(3)). Importantly, however, the CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions.

Executive Order S-14-08

Executive Order S-14-08 was established by Governor Arnold Schwarzenegger in November 2008. Executive Order S-14-08 improves processes for licensing renewable projects by directing state agencies to create comprehensive plans to prioritize regional renewable projects based on an area's renewable resource potential and the level of protection for plant and animal habitat. To implement and track the progress of the Executive Order, the California Energy Commission (CEC) and CDFG signed a Memorandum of Understanding formalizing a Renewable Energy Action Team to concurrently review permit applications filed at the state level to streamline the application process for renewable energy development. The specifics of this executive order include the following:

1. Requires retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020;
2. Requires various state agencies to streamline processes for the approval of new renewable energy facilities and determine priority renewable energy zones; and
3. Establishes the requirement for the creation and adoption of the Desert Renewable Energy Conservation Plan (DRECP) process for the Mojave and Colorado Desert regions.

This executive order does not include any specific requirements that pertain directly to the Project. However, the Project, as a renewable energy project, would help the utility contracting

the power from the Project to meet the established RPS standard. SB 2, enacted in 2011, codifies the requirement of 33 percent renewable electricity sources by 2020.

17 Cal. Code Regs. §95350 et seq.

The purpose of this regulation is to achieve GHG emission reductions by reducing SF_6 emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable annual emissions rates, which are reduced each year until 2020, after which annual emissions must not exceed 1.0 percent. Owners must regularly inventory GIS equipment and measure quantities of SF_6 and maintain records of these for at least 3 years. Additionally, by June 1 each year, owners also must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

3.5.3.3 Local

San Bernardino Greenhouse Gas Emissions Reduction Plan

In September 2011, San Bernardino County published the "Greenhouse Gas Emissions Reduction Plan." This plan presents a set of actions to reduce San Bernardino County's internal and external GHG emissions to 15 percent below current levels by 2020 (San Bernardino County, 2011).

3.5.4 Analytical Methodology

The analysis of potential climate change-related impacts of the Proposed Action and alternatives is based on technical information associated with GHG emissions estimates that would be generated during the construction, operation, maintenance, and decommissioning phases, as well as qualitative analysis related to the potential impacts that climate change may have on the Proposed Action and alternatives.

3.5.4.1 GHG Emissions Estimates

As part of the BLM and County permit application processes, the Applicant provided GHG emissions estimates for activities that would be associated with the Project (Pan Environmental, Inc., 2013; included as Appendix D of this PA/EIS/EIR). The emission estimates were independently reviewed and supplemented where appropriate by BLM and County staff and their consultant, ESA. The methods used to estimate Project emissions are described below.

Construction and Decommissioning Emissions

The combustion of fuel to provide power for the operation of various equipment (e.g., graders, dozers, cranes) and vehicles (e.g., haul trucks) that would be required to construct and decommission the Project would result in the generation of GHG emissions. The CO_2e emissions that would be generated from construction equipment and vehicle exhaust were estimated using CalEEMod with the same methodology and assumptions described for criteria pollutants (see Section 3.2.4.1, *Construction Emissions Estimates*).

To supplement the construction equipment and vehicle exhaust GHG emissions estimates, ESA prepared indirect emissions estimates for energy consumption that would be associated with the 480V electric distribution line that would be used at the solar plant site during construction as well as for water for dust control and other construction-related uses using information identified in Sections 2.4.3.11, *Construction Power*, and 2.4.2.8, *Water Supply, Storage, and Use*, and emission and use factors from the CEC and The Climate Registry (TCR) (ESA, 2013; CEC, 2005; and TCR, 2013). Although Section 2.4.3.11 only identifies the need for one distribution circuit to supply electricity to the trailers, for the purposes of estimating indirect GHG emissions, it is assumed that on-site water well pumps would be powered with electricity from the regional grid. Based on CEC use factors and the assumption that water would be obtained from wells at the Project site, it is estimated that 250 kWh of electricity would be required for every million gallons of water used.

Operation and Maintenance Emissions

The Applicant's consultant used CalEEMod to estimate GHG emissions that would be associated with Project operation and maintenance. CalEEMod was used to quantify indirect emissions related to energy use, solid waste disposal, wastewater generation, and water use, in addition to estimating direct emissions from mobile sources (i.e., vehicles). The model that was run relied primarily on Project-specific input data, including data for vehicle trips (see Section 3.2.4.2, *Operation and Maintenance Emissions Estimates*) and water use. For indirect GHG emissions associated with water use, approximately 2.1 million gallons of water use per year was used as model input. However, the Project is estimated to require up to 10.8 million gallons (33 acre-feet) of water per year associated with PV panel washing, potable water uses, and dust suppression (see Table 2-2, *Operation and Maintenance-related Water Use*). Therefore, the modeled indirect GHG emissions associated with water use were increased by a factor of 5.1 to more accurately reflect the Project assumptions provided by the Applicant (ESA, 2013). The remaining input data were based on CalEEMod default values (e.g., emission factors, natural gas usage, solid waste generation).

The Applicant's consultant also estimated emissions of SF_6 that could be released into the atmosphere due to leakage from electrical equipment such as circuit breakers. The calculations for SF_6 emission estimates were based on the conservative assumption that circuit breakers associated with the Proposed Action would contain up to 2,000 pounds of SF_6 that would leak to the atmosphere at a rate of 1.0 percent per year (Pan Environmental, Inc., 2013). For the purposes of estimating CO_2e associated with SF_6 emissions, it was assumed that SF_6 is weighted at a global warming potential of 23,900 based on a 100-year time horizon, which is consistent with state, federal, and international standards.

The Applicant's emissions estimates do not include emissions that would be associated with periodic testing and maintenance of the proposed emergency (standby) generator. Therefore, these emissions were estimated by ESA. For a conservative analysis, it was assumed that the standby generator would be diesel-powered, and, based on the size of the proposed diesel storage tank (i.e., 500 gallons), it is assumed that the engine rating of the generator would range between 250 hp and 500 hp. A fuel consumption factor for "other general industrial equipment" with an average engine rating of 355 hp was developed using CARB's OFFROAD2011 emissions model

to represent the average fuel consumption rate (i.e., gallons per hour) for the proposed standby generator. CO_2, CH_4, and N_2O emission factors for diesel fuel combustion identified by TCR (2013) were used with the global warming potential values for CH_4 and N_2O to estimate the CO_2e emissions that would be associated with the emergency generator testing. For the purposes of the emissions estimates, it is assumed that the standby generator would be operated no more than 50 hours per year for testing and maintenance (ESA, 2013).

Fossil Fuel-Based Energy Displacement

The reduction in GHG emissions by electricity displacement was estimated by ESA assuming that the solar power would displace electricity generated by dispatchable natural-gas fired combined-cycle power plants and that the Project or one of the alternatives would have a generation capacity factor of 25 percent for an average daily generation period of approximately 6 hours. A natural gas heat rate of 6,719 British thermal units per kilowatt hour (BTU/kWh) for energy generation by combined-cycle power plants (USDOE, 2007) and emission factors from TCR (2013) were used to estimate the displaced emissions (ESA, 2013).

Carbon Sequestration

The rate of existing carbon sequestration that occurs at the Project site has been estimated by the BLM's consultant under the assumption that the ongoing natural carbon uptake by desert vegetation is equivalent to 0.93 metric tons of CO_2 per acre per year (see Section 3.5.2.2, *Greenhouse Gases*). This rate of carbon uptake is based on several studies of the Mojave Desert ecosystem (Wohlfahrt et al., 2008 and Schlesinger, et al., 2009). The acreage of desert vegetation that would be disturbed by the Project or one of the action alternatives were obtained from Section 3.3.2.1, *Vegetation Communities*.

3.5.4.2 GHG Emissions Impact Analysis

Independent of NEPA but pursuant to 40 CFR Part 98, the Mandatory Reporting of Greenhouse Gases Rule, the USEPA requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year (USEPA, 2013c). In addition, pursuant to 40 CFR Part 52, the Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, the USEPA has applied PSD and Title V requirements to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2013b). Consistent with these requirements, this analysis compares the estimated GHG emissions for the Project and alternatives to the federal GHG mandatory emissions reporting threshold of 25,000 metric tons per year to determine whether the GHG emissions could contribute substantially to global climate change.

With regard to the CEQA review, which allows significance criteria established by the applicable air district to be used to assess the impact of a project relative to GHG emissions, the CEQA significance determination relative to Project GHG emissions is based on a comparison of the estimated direct and indirect GHG emissions of the Project and alternatives to the MDAQMD's annual CO_2e CEQA threshold of 100,000 tons CO_2e to determine whether the GHG emissions generated by the Project or any of the alternatives would significantly contribute to global climate change (MDAQMD, 2011).

3.5.4.3 Climate Change Impact on the Project

Agencies within the DOI are required by Secretarial Order No. 3289 to consider potential impacts associated with climate change, including potential changes in flood risk, water supply, sea level rise, wildlife habitat and migratory patterns, invasion of exotic species, and potential increases in wildfires (U.S. Secretary of the Interior, 2009). In addition, climate change is expected to result in a suite of additional potential changes that could affect the natural environment, in a manner that is relevant to the Project. The potential for climate change to affect the Project is discussed qualitatively.

3.5.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs specifically to address potential impacts to climate change.

3.5.6 Direct and Indirect Effects

3.5.6.1 Alternative A: Proposed Action

Construction

Table 3.5-3 shows the estimated GHG emissions that would be generated by Proposed Action construction activities for each calendar year during the 24-month construction period.[2] As shown in the table, annual CO_2e construction emissions that would be associated with the Proposed Action would vary between 3,282 metric tons and 9,152 metric tons, which is below the federal mandatory emissions reporting threshold of 25,000 metric tons per year. Refer to Section 3.5.4, *Analytical Methodology*, for a discussion of the methods used to estimate each of the construction emissions sources.

TABLE 3.5-3
ESTIMATED ANNUAL CONSTRUCTION GHG EMISSIONS FOR PROPOSED ACTION

Year	Annual CO_2e Emissions (metric tons/year)		
	Equipment and Vehicle Exhaust	Indirect Electricity and Water Use	Total Emissions
2014	4,679.03	6.62	4,685.65
2015	9,139.18	13.24	9,152.42
2016	3,275.47	6.62	3,282.09
Federal Reporting Threshold	---	---	25,000

SOURCES: Pan Environmental Inc., 2013, and ESA, 2013

[2] Construction of the Proposed Action would occur over a period of approximately 24 to 30 months depending on a wide range of variables; however, a compressed construction duration of 24 months conservatively was used in the model analysis

Operation and Maintenance

Table 3.5-4 shows the estimated annual long-term GHG emissions that would be directly and indirectly generated each year during operation and maintenance of the Proposed Action. Annual operation and maintenance emissions are estimated at 1,031 metric tons CO_2e per year, which is well below the federal mandatory emissions reporting threshold of 25,000 metric tons per year.

TABLE 3.5-4
ANNUAL OPERATION AND MAINTENANCE GHG EMISSIONS FOR THE PROPOSED ACTION

Direct and Indirect Sources	Annual CO_2e Emissions (metric tons)
Energy Use	2.63
Mobile Sources	694.22
Waste Generation	75.02
Water Use*	38.63
Circuit Breaker SF_6 Leakage	216.77
Emergency Generator Testing	3.23
Total	**1,030.50**
Federal Report Threshold	25,000

* Modeled water use emissions were increased by a factor of 5.2 to accurately represent the Proposed Action.

SOURCES: Pan Environmental Inc., 2013, and ESA, 2013

Carbon Sequestration

In addition to direct and indirect emissions of GHGs, the Project would result in the clearing of land and complete removal of the existing desert ecosystem over a portion of the Project site. This would reduce the ongoing natural carbon uptake by vegetation. As discussed above, studies of Mojave Desert vegetation indicate that the desert may uptake carbon in amounts equivalent to 0.93 metric tons of CO_2 per acre per year. As indicated in Section 3.3.2.1, *Vegetation Communities*, the Proposed Action would include the removal of approximately 2,456 acres of vegetation.[3] Based on these assumptions, the maximum carbon uptake expressed as CO_2 that would be eliminated as a result of Project-related ground disturbance would be about 2,284 metric tons of CO_2 per year.

Fossil Fuel-Based Energy Displacement

The renewable source of energy that would be associated with the Proposed Action could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. The reduction in GHG emissions by electricity displacement was estimated under the assumption that the solar power would displace electricity generated by dispatchable natural gas-fired combined-cycle power plants and that the Proposed Action would have a capacity factor of 25 percent. Assuming that the renewable energy produced by the Proposed Action would displace

[3] Includes permanent and temporary disturbance of Larrea tridentate – Ambrosia dumosa Shrubland, Larrea tridentate Shrubland, and Ambrosia salsola Shrubland Alliance shown in Table 3.3-2.

approximately 784 million kWh per year of gas-fired generation, the Proposed Action would displace an estimated 283,785 metric tons CO_2e annually (ESA, 2013).

Decommissioning

At the end of the 30-year term of the BLM ROW grant, Project operation and maintenance would cease and associated facilities would be decommissioned and dismantled, and the site would be restored. GHG emissions from decommissioning are expected to be similar to the emissions estimated for construction (see above).

Impact Summary

As described above, short-term Project-related construction activities would result in much higher levels of GHG emissions compared to long-term operation and maintenance of the Project. The total emissions related to construction activities would be approximately 4,686 metric tons in 2014, approximately 9,152 metric tons in 2015, and approximately 3,282 metric tons in 2016. Each year construction GHG emissions would be less than the federal mandatory emissions reporting threshold of 25,000 metric tons per year. As shown in Table 3.5-5, the sum of annual long-term operation and maintenance GHG emissions (including direct and indirect emissions) combined with the CO_2 emissions that would not be sequestered would be up to 3,315 metric tons CO_2e per year, which would be below the federal GHG mandatory emissions reporting threshold of 25,000 metric tons.

TABLE 3.5-5
TOTAL ANNUAL LONG-TERM GHG EMISSIONS FOR THE PROPOSED ACTION

Emission Sources	Annual CO_2e Emissions (metric tons)
Direct and Indirect Annual Operation Emissions	1,031
CO_2 lost from Carbon Sequestration	2,284
Total Annual Operation	**3,315**
Federal Reporting Threshold	25,000
Exceeds Threshold?	No

SOURCES: Pan Environmental Inc, 2013, and ESA 2013

In addition, assuming that full build-out of the Proposed Action would displace existing electricity from natural gas-fired combined-cycle power plants, the Proposed Action would displace over 283,785 metric tons of CO_2e annually (see above), resulting in a net reduction of over 280,470 metric tons CO_2e per year. This would be a beneficial impact.

Climate Change Effects on the Proposed Action

In addition to global warming, climate change also is expected to result in a suite of additional potential changes that could affect the natural environment, including hydrologic resources (e.g., sea level rise and flooding), water resource availability, and impacts to biological resources.

Many potential changes would not affect the Proposed Action due to its location and geography (the Mojave Desert at an elevation of approximately 1,200 feet amsl). A summary of issues and hazards that could affect the Proposed Action are discussed below. The potential for climate change effects on individual resources that will be impacted by the Project has also been incorporated into the affected environment as appropriate.

Hydrologic Resources

Climate change is anticipated to affect the frequency and intensity of extreme weather events, including large storm events and droughts in western watersheds (CDWR, 2008; 2011). The Project site and its vicinity could experience an increase in the frequency and intensity of high rainfall and flood events, which could result in potential stormwater runoff and flooding, and an increase in erosion and sedimentation on-site and downstream from the site. As discussed in Section 3.19, *Water Resources*, Mitigation Measure 3.19-2 includes the preparation of a Comprehensive Drainage, Stormwater, and Sedimentation Plan. Implementation of this plan would minimize or avoid the degradation of the Project from increased runoff, especially during major storm events.

Water Resources Availability

As discussed in Section 3.19, *Water Resources*, the Project site and immediate vicinity contain only ephemeral drainages and washes. Surface waters in the Project area and its immediate vicinity occur only during substantial precipitation events, when surface runoff occurs. There are no perennial streams or other perennial waterways located on site. The Project would not rely on surface water for water supply during construction or operation. Instead, the Project would rely on groundwater for water supply during both construction and operation. Climate change is expected to result in some degree of reduction of precipitation, and periods of drought could increase, resulting in an overall reduction in the availability of water in the Project area.

In the event that climate change results in reduced precipitation within the Project area and its vicinity, some degree of associated reduction in groundwater recharge from rainfall could occur. This situation would not result in increased water requirements by the Project, and would not result in additional groundwater pumping during Project construction or operation and maintenance. Therefore, even with potential reductions in total precipitation volume associated with future climate change, no increase in pumping would be required.

Other Issues

In addition to the resource issues discussed above, potential climate change-related impacts associated with soil moisture and fugitive dust concentrations also could have effects on the Project site.

Soil Moisture. As discussed in Section 3.7, *Geology and Soil Resources*, almost all rainfall that occurs in this region of California is lost through evaporation and evapotranspiration. Soil moisture at the Project site is characteristically low. Although precise changes are impossible to predict, climate change could result in increases in extreme weather events, including droughts and heat waves, and an overall reduction in precipitation. These conditions could result in a concurrent

reduction in soil moisture content at the site and regionally. However, reductions in soil moisture content would not affect Project operation, and would not require any change in water resources usage. Additionally, the proposed facilities would in no way support additional drying of soils on site, or otherwise exacerbate potential changes in soil moisture associated with climate change.

Fugitive Dust. As discussed in Chapter 2, *Proposed Action and Alternatives*, operation and maintenance of the Proposed Action would include panel washing to remove dust and dirt build-up on solar panels, which reduces the amount of incoming solar radiation striking the active PV layer within the panel. Although climate change could result in some degree of reduction of soil moisture, as discussed above, soil moisture is already very low under current conditions. Any further reductions in soil moisture would be inconsequential in terms of the absolute amount of water contained in on-site soils. Therefore, any potential further reductions in soil moisture associated with climate change are not anticipated to result in a substantial increase in fugitive dust emissions. In addition, implementation of Mitigation Measure 3.2-1 would increase soil moisture at the Project site through the application of water to all unpaved roads and unpaved parking areas actively used during operation and maintenance.

Hazards

Heat-related hazards, including potential increases in wildland fire and heat waves, could be exacerbated by climate change (IPCC, 2007; ISDR, 2008).

Wildland Fire Risks. Climate change generally would result in a small increase in temperature, and also could result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves (IPCC, 2007; ISDR, 2008) during operation of the Proposed Action. In compliance with applicable regulations and mitigation proposed in Section 3.20, *Wildland Fire Ecology*, the Applicant would prepare and implement a Fire Safety Plan to ensure the safety of workers and the public (see Mitigation Measure 3.20-1). Although the risk of wildfire that could affect the site could increase as a result of climate change, these potential increases in risk are expected to be offset by ongoing compliance with the worker safety and fire protection regulations and mitigation specified in Section 3.20. Therefore, no additional mitigation is recommended.

Heat Waves. The frequency of occurrence and the severity of heat waves could increase as a result of climate change (IPCC, 2007; ISDR, 2008). Heat waves could result in increased potential risk to Project employees. However, the Project would be required to meet state requirements for worker safety associated with heat stress. No further actions are recommended.

3.5.6.2 Alternative B

Direct and Indirect GHG Emissions Impacts

Under Alternative B, only the East and South arrays would be constructed, as described for the Proposed Action, and the North Array would not be constructed. It is assumed that daily construction activity and the associated workforce for Alternative B would be the same as under the Proposed Action; however, the construction duration for Alternative B would be approximately

6 months less as a result of the elimination of the North Array. The construction emissions for Alternative B were estimated by scaling the emissions for the Proposed Action based on attributes (i.e., area of disturbance, MW rating, and total months of construction) of Alternative B compared to attributes of the Proposed Action (see Section 3.2.6.2 for additional details related to scaling construction emissions for Alternative B). Table 3.5-6 summarizes GHG emissions associated with construction of Alternative B. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 would be approximately 7 percent less compared to the Proposed Action, and there would be no construction emissions generated in 2016.

TABLE 3.5-6
ESTIMATED ANNUAL CONSTRUCTION GHG EMISSIONS FOR ALTERNATIVE B

Year	Annual CO_2e Emissions (metric tons)		
	Equipment and Vehicle Exhaust	Indirect Electricity and Water Use	Total Emissions
2014	4,679.03	6.62	4,685.65
2015	8,463.06	12.26	8,475.32
2016	0.00	0.00	0.00
Federal Reporting Threshold	---	---	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

Emissions associated with operation and maintenance of Alternative B also would be reduced compared to the Proposed Action because the reduced scale would require less annual maintenance. Energy use, mobile sources, waste generation, water use, and circuit breaker SF_6 leakage emissions were all scaled 74 percent based on total MW capacity of Alternative B compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. Table 3.5-7 shows the estimated annual long-term GHG emissions that would be directly and indirectly generated each year during operation and maintenance of Alternative B. Annual operation and maintenance emissions are estimated at approximately 761 metric tons CO_2e per year, which is well below the federal mandatory emissions reporting threshold of 25,000 metric tons per year.

In addition to direct and indirect emissions of GHGs, Alternative B would result in the clearing of land and complete removal of the existing desert ecosystem over a portion of the site. As indicated in Section 3.3.2.1, *Vegetation Communities*, Alternative B would include the removal of approximately 1,818 acres of vegetation. Based on the assumed carbon uptake rate 0.93 metric tons of CO_2 per acre per year, the maximum carbon uptake expressed as CO_2 that would be eliminated as a result of ground disturbance under Alternative B would be about 1,691 metric tons of CO_2 per year. The sum of annual operation GHG emissions (including direct and indirect emissions) combined with the CO_2 that would not be sequestered would be up to 2,452 metric tons CO_2e per year, which would be below the federal GHG mandatory emissions reporting threshold of 25,000 metric tons.

TABLE 3.5-7
ANNUAL OPERATION AND MAINTENANCE GHG EMISSIONS FOR ALTERNATIVE B

Direct and Indirect Sources	Annual CO_2e Emissions (metric tons)
Energy Use	1.94
Mobile Sources	511.94
Waste Generation	55.32
Water Use	28.49
Circuit Breaker SF_6 Leakage	159.85
Emergency Generator Testing	3.23
Total	**760.77**
Federal Report Threshold	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

The renewable source of energy that would be associated with Alternative B could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. Assuming that the renewable energy produced by Alternative B would displace approximately 578 million kWh per year of gas-fired generation, Alternative B would displace an estimated 209,272 metric tons CO_2e annually, resulting in a net reduction of approximately 206,820 metric tons CO_2e per year. This would be considered a beneficial impact relative to the baseline; however, the emission reductions associated with Alternative B would be approximately 26 percent less than that discussed for the Proposed Action (Section 3.5.5.1).

Climate Change Effects on Alternative B

Potential climate change effects on Alternative B would be substantially the same as those discussed for the Proposed Action (see Section 3.5.5.1).

3.5.6.3 Alternative C

Direct and Indirect GHG Emissions Impacts

Under Alternative C, only the North and South arrays would be constructed. It is assumed that daily construction activity and the associated workforce for Alternative C would be the same as under the Proposed Action; however, the construction duration for Alternative C would be approximately 4 months less as a result of the elimination of the East Array. The construction emissions for Alternative C were estimated by scaling the emissions for the Proposed Action based on attributes (i.e., area of disturbance, MW rating, and total months of construction) of Alternative C compared to attributes of the Proposed Action (see Section 3.2.6.3 for additional details related to scaling construction emissions for Alternative C). Table 3.5-8 summarizes GHG emissions associated with construction of Alternative C. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 and 2016 would be approximately 4 percent and 67 percent less compared to the Proposed Action, respectively.

TABLE 3.5-8
ESTIMATED ANNUAL CONSTRUCTION GHG EMISSIONS FOR ALTERNATIVE C

Year	Annual CO_2e Emissions (metric tons)		
	Equipment and Vehicle Exhaust	Indirect Electricity and Water Use	Total Emissions
2014	4,679.03	6.62	4,685.65
2015	8,781.06	12.72	8,793.79
2016	1,082.29	2.19	1,084.47
Federal Reporting Threshold	---	---	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

Emissions associated with operation and maintenance of Alternative C also would be reduced compared to the Proposed Action because the reduced scale would require less annual maintenance. Energy use, mobile sources, waste generation, water use, and circuit breaker SF_6 leakage emissions were all scaled 83 percent based on total MW capacity of Alternative C compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. Table 3.5-9 shows the estimated annual long-term GHG emissions that would be directly and indirectly generated each year during operation and maintenance of Alternative C. Annual operation and maintenance emissions are estimated at approximately 858 metric tons CO_2e per year, which is well below the federal mandatory emissions reporting threshold of 25,000 metric tons per year.

TABLE 3.5-9
ANNUAL OPERATION AND MAINTENANCE GHG EMISSIONS FOR ALTERNATIVE C

Direct and Indirect Sources	Annual CO2e Emissions (metric tons)
Energy Use	2.19
Mobile Sources	577.87
Waste Generation	62.45
Water Use	32.16
Circuit Breaker SF_6 Leakage	180.44
Emergency Generator Testing	3.23
Total	**858.33**
Federal Report Threshold	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

Alternative C also would result in the clearing of land and complete removal of the existing desert ecosystem over a portion of the site. As indicated in Section 3.3.2.1, *Vegetation Communities*, Alternative C would include the removal of approximately 2,024 acres of vegetation. Based on the assumed carbon uptake rate 0.93 metric tons of CO_2 per acre per year, the maximum carbon uptake expressed as CO_2 that would be eliminated as a result of ground disturbance under Alternative C would be about 1,882 metric tons of CO_2 per year. The sum of annual operation

GHG emissions (including direct and indirect emissions) combined with the CO_2 that would not be sequestered would be up to 2,741 metric tons CO_2e per year, which would be below the federal GHG mandatory emissions reporting threshold of 25,000 metric tons.

The renewable source of energy that would be associated with Alternative C could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. Assuming that the renewable energy produced by Alternative C would displace approximately 653 million kWh per year of gas-fired generation, Alternative C would displace an estimated 236,223 metric tons CO_2e annually, resulting in a net reduction of over 233,483 metric tons CO_2e per year. This would be considered a beneficial impact relative to the baseline; however, the emission reductions associated with Alternative C would be approximately 17 percent less than that discussed for the Proposed Action (Section 3.5.5.1).

Climate Change Effects on Alternative C

Potential climate change effects on Alternative C would be substantially the same as those discussed for the Proposed Action (see Section 3.5.5.1).

3.5.6.4 Alternative D

Direct and Indirect GHG Emissions Impacts

Under Alternative D, the East and South arrays would be reduced in size, and the North Array, substation, and switchyard would be built as proposed under the Project. It is assumed that daily construction activity and the associated workforce for Alternative D would be the same as under the Proposed Action; however, the construction duration for Alternative D would be approximately 7 months less as a result of the reduced size for the East and South arrays. The estimated construction for Alternative D were estimated by scaling the emissions estimated for the Proposed Action based on attributes (i.e., area of disturbance, MW rating, and total months of construction) of Alternative D compared to attributes of the Proposed Action (see Section 3.2.6.4 for additional details related to scaling construction emissions for Alternative D). Table 3.5-10 summarizes GHG emissions associated with construction of Alternative D. As noted in the table, emissions during 2014 would be the same as for the Proposed Action; however, emissions during 2015 would be 17 percent less compared to the Proposed Action, and there would be no construction emissions generated in 2016.

Emissions associated with operation and maintenance of Alternative D also would be reduced compared to the Proposed Action because the reduced scale would require less annual maintenance. Energy use, mobile sources, waste generation, water use, and circuit breaker SF_6 leakage emissions were all scaled 71 percent based on total MW capacity of Alternative D compared to the Proposed Action; however, it is anticipated that there would be no change in emergency generator testing compared to the Proposed Action. Table 3.5-11 shows the estimated annual long-term GHG emissions that would be directly and indirectly generated each year during operation and maintenance of Alternative D. Annual operation and maintenance emissions are estimated at 721 metric tons CO_2e per year, which is well below the federal mandatory emissions reporting threshold of 25,000 metric tons per year.

TABLE 3.5-10
ESTIMATED ANNUAL CONSTRUCTION GHG EMISSIONS FOR ALTERNATIVE D

Year	Annual CO_2e Emissions (metric tons)		
	Equipment and Vehicle Exhaust	Indirect Electricity and Water Use	Total Emissions
2014	4,679.03	6.62	4,685.65
2015	7,889.56	11.43	7,900.99
2016	0.00	0.00	0.00
Federal Reporting Threshold	---	---	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

TABLE 3.5-11
ANNUAL OPERATION AND MAINTENANCE GHG EMISSIONS FOR ALTERNATIVE D

Direct and Indirect Sources	Annual CO_2e Emissions (metric tons)
Energy Use	1.84
Mobile Sources	484.79
Waste Generation	52.39
Water Use	26.98
Circuit Breaker SF_6 Leakage	151.38
Emergency Generator Testing	3.23
Total	**720.60**
Federal Report Threshold	25,000

SOURCES: Pan Environmental Inc., 2013; ESA, 2013

Alternative D would also result in the clearing of land and complete removal of the existing desert ecosystem over a portion of the site. As indicated in Section 3.3.2.1, *Vegetation Communities*, Alternative D would include the removal of approximately 1,901 acres of vegetation. Based on the assumed carbon uptake rate 0.93 metric tons of CO_2 per acre per year, the maximum carbon uptake expressed as CO_2 that would be eliminated as a result of ground disturbance under Alternative D would be about 1,768 metric tons of CO_2 per year. The sum of annual operation GHG emissions (including direct and indirect emissions) combined with the CO_2 that would not be sequestered would be up to 2,489 metric tons CO_2e per year, which would be below the federal GHG mandatory emissions reporting threshold of 25,000 metric tons.

The renewable source of energy that would be associated with Alternative D could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. Assuming that the renewable energy produced by Alternative D would displace approximately 548 million kWh per year of gas-fired generation, Alternative D would displace an estimated 198,174 metric tons CO_2e annually, resulting in a net reduction of over 195,685 metric tons CO_2e per year. This would be considered a beneficial impact relative to the baseline; however,

the emission reductions associated with Alternative D would be approximately 30 percent less than that discussed for the Proposed Action (Section 3.5.5.1).

Climate Change Effects on Alternative D

Potential climate change effects on Alternative D would be substantially the same as those discussed for the Proposed Action (see Section 3.5.5.1).

3.5.6.5 Alternative E: No Action/No Project

If Alternative E was implemented, no changes would occur, and the existing environmental setting would be maintained. As a no-development alternative, Alternative E would result in no new GHG emissions. However, the benefits of displacing electricity generated from fossil fuel combustion would not be realized, and the long-term adverse impact associated with annual GHG emissions compared to implementation of the Proposed Action would continue.

3.5.6.6 Alternative F: CEQA No Project

Because Alternative F would require an off-site source of water, it would require an average of approximately 20 truck trips (40 one-way trips) per day, 7 days per week to deliver an average of 200,000 gallons per day to the site. GHG emissions that would result from construction-related water truck trips were estimated by the Applicant's air quality consultant and peer reviewed and revised by the BLM's and County's environmental consultant, ESA (see Table 3.5-12). Upon review of the water truck GHG emissions estimates, ESA determined that the Applicant's estimates were substantially underestimated. Table 3.5-12 includes emissions estimates that were developed using EMFAC2011 and TCR emission factors. The emissions presented in Table 3.5-12 represent only emissions that would be generated by importing water to the Project site, which would be in addition to other construction-related GHG emissions associated with the solar PV energy facility.

TABLE 3.5-12
ESTIMATED ANNUAL CONSTRUCTION WATER TRUCK GHG EMISSIONS FOR ALTERNATIVE F

Year	Annual CO_2e Water Truck Emissions (metric tons)
2014	99.69
2015	199.39
2016	99.69

SOURCE: ESA, 2013

With regard to long-term operations, Alternative F would include additional emissions from up to 11 truck trips (22 one-way trips) per day to deliver water to the site for dust control, panel washing, and potable uses. GHG emissions that would result from operation-related water truck trips were estimated by the Applicant's consultant to be 94 metric tons CO_2e per year (Pan Environmental, Inc., 2013). These emissions represent only those that would be generated by importing water to the

Project site, which would be in addition to other operation and maintenance-related emissions associated with the solar PV energy facility.

3.5.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G was implemented, no solar development-related changes would occur on the site, and the existing environmental setting described in Section 3.5.2 would be maintained. As a no-development alternative, Alternative G would result in no new GHG emissions. However, the benefits of displacing electricity generated from fossil fuel combustion would not be realized, and the long-term adverse impact associated with annual GHG emissions compared to implementation of the Proposed Action would continue.

3.5.7 Cumulative Effects

GHG emissions are inherently a cumulative concern because it is the accumulation of GHG emissions in the atmosphere around the earth that results in global climate change; therefore, the geographic scope of cumulative impacts related to GHG emissions and climate change is global. The Project would result in short-term GHG emissions during construction and decommissioning, limited long-term GHG emissions during operation and maintenance, and would result in a long-term reduction of carbon sequestration at the site. However, the Proposed Action would result in a long-term net reduction of approximately 280,470 metric tons of CO_2e per year by displacing electricity from fossil fuel-fired power plants, and therefore would not conflict with the state's GHG reduction goals. Similarly, Alternatives B through D and F would also result in a long-term net reduction of CO_2e, though less than that of the Proposed Action as described in Sections 3.5.6.2 through 3.5.6.4 and 3.5.6.6. Alternatives E and G would result in no new or displaced CO_2e emissions because no development would occur and no new renewable source of electricity would be created. All of the cumulative projects described in Table 3.1-3 in Section 3.1, *Introduction*, could contribute to global warming due to the generation of short-term and/or long-term GHG emissions. Of these, similar to the Project, the renewable energy projects in the cumulative scenario could result in long-term decreases in GHG emissions by displacing electricity from fossil fuel-fired power plants.

3.5.8 Mitigation Measures

None recommended.

3.5.9 Residual Effects

Because no APMs have been proposed and no mitigation measures are recommended, residual impacts related to climate change would be the same as those described in Sections 3.5.6 and 3.5.7.

3.5.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Sections 15064.4 and 15064.7(c), as well as Appendix G Section VII, a project would cause adverse impacts associated with GHG emissions if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

3.5.10.1 Alternative A: Proposed Action

a) Impact GHG-1: The Proposed Action would generate direct and indirect GHG emissions. (Less than Significant)

As shown in Tables 3.5-3 and 3.5-5, the maximum annual GHG emissions that would be associated with construction of the Proposed Action would be up to 9,152 metric tons (10,089 tons), and the total annual long-term GHG emissions that would be associated with operation and maintenance would be 3,315 metric tons (3,654 tons). These emissions levels would be below the MDAQMD's annual CO_2e CEQA significance threshold of 100,000 tons CO_2e (MDAQMD, 2011). Therefore, GHG emissions associated with the Proposed Action would result in a less-than-significant impact on the environment. In addition, the Proposed Action could displace electricity generated from fossil fuel-fired power plants equivalent to an estimated 283,785 metric tons of CO_2e annually, resulting in a net reduction of more than 280,470 metric tons CO_2e per year.

In light of the Project's net reduction of more than 280,470 metric tons CO_2e per year, its contribution to potential cumulative effects would not be cumulatively considerable.

b) The Proposed Action would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (No Impact)

The Project has been evaluated relative to its potential to conflict with the San Bernardino GHG Emissions Reduction Plan and certain GHG reduction goals set forth in AB 32, including the applicable Recommended Actions identified by CARB in its Climate Change Scoping Plan (see Table 3.5-2). The Project would be consistent with the San Bernardino GHG Emissions Reduction Plan because it would contribute to GHG emissions reductions in the County. Consistency with the AB 32 reduction goals associated with transportation, the RPS, and high global warming potential gases has been evaluated and are disclosed below.

Scoping Plan Measure T-7: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency). This measure would require existing trucks and trailers to be retrofitted with the best available technology and/or CARB-approved technology. This measure has been identified as a Discrete Early Action, which means that it began to be enforceable starting in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that

reduce aerodynamic drag and rolling resistance. The requirements apply to California and out-of-state registered trucks that travel to California. This measure requires fleet owners of in-use trucks and trailers to comply through a phase-in schedule starting in 2010 and achieve 100 percent compliance by 2014. Project construction would begin in 2014 and therefore would be required to comply with the regulations associated with Scoping Plan Measure T-7. The Project would be consistent with this recommended action.

Scoping Plan Measure E-3: Renewables Portfolio Standard (RPS). The RPS promotes multiple objectives, including diversifying the electricity supply. Increasing the RPS to 33 percent is designed to accelerate the transformation of the electricity sector. The Project would add renewable solar energy to the electricity supply and would therefore be consistent with this recommended action.

Scoping Plan Measure H-6: High Global Warming Potential Gas Reductions from Stationary Sources – SF_6 Leak Reduction and Recycling in Electrical Applications. This measure would reduce emissions of SF_6 within the electric utility sector and at particle accelerators by requiring the use of best achievable control technology for the detection and repair of leaks and the recycling of SF_6. On June 17, 2011, the approved Final Regulation Order associated with Scoping Plan Measure H-6 for reducing SF_6 emissions from gas insulated switchgear became effective. The regulation establishes maximum annual SF_6 emission rates for gas insulated switchgear, starting in 2011 at 10 percent of the owners' total equipment capacity. The required emission rates will steadily decline by 1 percent per year until 2020, at which time the maximum annual SF_6 emission rate would be set at 1 percent. The regulation also requires gas insulated switchgear owners to annually report their SF_6 emissions and emission rate to CARB (CARB, 2012).

The Project would include installation of SF_6-containing circuit breakers that would have a fugitive emissions leak rate of less than 1 percent per year (Pan Environmental, Inc., 2013). This would ensure that there would be little potential for the Project to conflict with compliance of this regulation and there would be no impact.

Because the Project would cause no impact related to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, it could not cause or contribute to any cumulative effect in this regard.

3.5.10.2 Alternative B

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative B because, as described above and for purposes of potential climate change impacts, the Project and this alternative are substantially the same. See Section 3.5.9.1 for the Proposed Action CEQA significance determinations and Section 3.5.5.2 for the Alternative B impact analysis.

3.5.10.3 Alternative C

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative C because, as described above and for purposes of potential climate change impacts, the Project and this alternative are substantially the same. See Section 3.5.9.1 for the Proposed Action CEQA significance determinations and Section 3.5.5.3 for the Alternative C impact analysis.

3.5.10.4 Alternative D

The impact statements and CEQA significance determinations identified for the Proposed Action are also applicable to Alternative D because, as described above and for purposes of potential climate change impacts, the Project and this alternative are substantially the same. See Section 3.5.9.1 for the Proposed Action CEQA significance determinations and Section 3.5.5.4 for the Alternative D impact analysis.

3.5.10.5 Alternative E: No Action/No Project

Alternative E would not result in GHG emissions-related impacts from Project construction, operation and maintenance, or decommissioning because these activities would not occur. Because Alternative E would cause no impact related to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect related to GHG emissions.

3.5.10.6 Alternative F: CEQA No Project

The impact statements and CEQA significance determinations identified for the Proposed Action would likely also be applicable to Alternative F, depending on the specific layout and size of the solar energy facility that would be developed. Although the need to transport water for the Project from off-site would generate additional GHG emissions, when considered in the global context, the differences in total emissions among the alternatives would be inconsequential. See Section 3.5.9.1 for the Proposed Action CEQA significance determinations and Section 3.5.5.6 for the Alternative F impact analysis.

3.5.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would not result in GHG emissions-related impacts from Project construction, operation and maintenance, or decommissioning because these activities would not occur. Because Alternative G would cause no impact related to any of the CEQA criteria identified above, Alternative G would not cause or contribute to any cumulative effect related to GHG emissions.

References

California Air Resources Board (CARB), 2009. Climate Change Scoping Plan: A Framework for Change. December 2008, amended version included errata and Board requested modifications posted May 11, 2009.

CARB, 2012. Sulfur Hexafluoride (SF_6) Emission Reductions from Gas Insulated Switchgear. [http://www.arb.ca.gov/cc/sf6elec/sf6elec.htm] Accessed July 8, 2013.

CARB, 2013a. California Air Resources Board, California Greenhouse Gas Inventory for 2000-2010 – by Category as Defined in the Scoping Plan, February 19.

CARB, 2013b. AB 32 Scoping Plan. [http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm] Accessed August 8, 2013.

California Department of Water Resources (CDWR), 2008. Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water, October.

CDWR, 2011. Climate Change Handbook for Regional Water Planning, Section 1 Overview of IRWM Planning and Climate Change, November.

California Energy Commission (CEC), 2005. California's Water – Energy Relationship, November 2005.

ESA, 2013. Greenhouse Gas Emission Estimates.

Intergovernmental Panel on Climate Change (IPCC), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the International Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA.

International Strategy for Disaster Reduction (ISDR), 2008. Briefing Note No. 1, Climate Change and Disaster Risk Reduction, 2008.

Mojave Desert Air Quality Management District (MDAQMD), 2011. California Environmental Quality Act (CEQA) and General Conformity Analysis Guidelines. August.

Pan Environmental, Inc, 2013. Final Air Quality and Greenhouse Gas Impact Analysis Soda Mountain Solar Project, May.

San Bernardino County, 2011. San Bernardino County Greenhouse Gas Emissions Reduction Plan. September.

Schlesinger, William, Jayne Belnap, and Giles Marion, 2009. On carbon sequestration in desert ecosystems. Global Change Biology (2009) 15, 1488-1490.

The Climate Registry (TCR), 2013. The Climate Registry's 2013 Default Emission Factors, January 2, 2013.

U.S. Department of Energy (USDOE), National Energy Technology Laboratory, 2007. Cost and Performance Baseline for Fossil Energy Plants, Vol. 1, DOE/NETL-2007/1281, May.

U.S. Environmental Protection Agency (USEPA), 2013a. Sources of Greenhouse Gas Emissions. [http://www.epa.gov/climatechange/ghgemissions/sources.html] Accessed April 2, 2013.

USEPA, 2013b. Clean Air Act Permitting for Greenhouse Gas Emissions – Final Rules Fact Sheet. [http://www.epa.gov/NSR/ghgdocs/20101223factsheet.pdf] Accessed July, 1, 2013.

USEPA, 2013c. Greenhouse Gas Reporting Program– Basic Information. [http://www.epa.gov/ghgreporting/basic-info/index.html] Accessed June 3, 2013.

U.S. Secretary of the Interior, 2009. Order No. 3289. Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources. September 14.

Wohlfahrt, Georg, Lynn F. Fenstermaker, and John A. Arnone III, 2008. Large annual net ecosystem CO_2 uptake of a Mojave Desert ecosystem. Global Change Biology (2008) 14, 1475–1487.

This page intentionally left blank

3.6 Cultural Resources

3.6.1 Introduction

This section analyzes potential direct, indirect, and cumulative impacts to cultural resources from construction, operation, maintenance, and decommissioning of the Proposed Action and alternatives, as well as the implementation of mitigation measures that would avoid or minimize such impacts. The section also provides evidence of the ongoing public process by which the BLM and the County are complying with federal, state, and local requirements. The BLM is the lead agency for the purpose of complying with FLPMA and NEPA, and has further responsibilities to consult with Tribes pursuant to NHPA Section 106 (16 USC §470f) and on a government-to-government basis pursuant to other authorities. The County is the lead agency for the purpose of complying with CEQA. Numerous comments regarding the Project's potential effect on existing cultural and historic resources in the area were received during the scoping process. Many of the cultural resource comments expressed concern about the handling of Native American artifacts during the Project's development and requested that the BLM conduct Native American tribal consultation throughout the permitting process (see Appendix B).

Cultural resources are expressions of human culture and history in the physical environment, and may include archaeological sites, buildings, structures, objects, districts, works of art, architecture, and natural features that were important in past human events. They may consist of physical remains, but also may include areas where significant human events occurred, even though evidence of the events no longer remains. Cultural resources also include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Under NEPA, impacts on all cultural resources are considered, regardless of their eligibility for inclusion in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or local historic designation (40 CFR 1508.27(b)(3); 40 CFR 1508.27(b)(8)).

Cultural resources generally are evaluated as one of the following resource types: prehistoric archaeological resource; ethnographic resource; and historic-period archaeological and built environment resources.

Prehistoric archaeological resources are associated with human occupation and use prior to sustained European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the 18th century until 1769, when the first Europeans permanently settled in California (see Section 3.6.1.2 for details).

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape features, cemeteries, shrines, or ethnic neighborhoods and structures. No ethnographic resources have been identified within the Area of Potential Effects (APE) (see Section 3.6.1.2 for details).

Historic-period resources, both archaeological and built environment (e.g., structures, buildings, or other built features) are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity (see Section 3.6.1.2 for details).

As explained in the National Park Service's *Guidelines for Evaluating and Documenting Traditional Properties* (Parker and King, 1990), sacred sites and other places of traditional cultural importance, which sometimes are referred to as traditional cultural properties (TCPs), are associated with the cultural practices or beliefs of a living community. TCPs are rooted in the community's history and are important in maintaining cultural identity. Such places may be eligible for the National Register. Examples of TCPs for Native American communities may include places used for ceremonies and worship, natural landscape features, places where plants are gathered that are used in traditional medicines and ceremonies, places where artisan materials are found, and places and features of traditional subsistence systems. Given the nature of these resources, in many cases they may not be identified during conventional archeological, historical, or architectural surveys. As a result, determining the existence and/or significance of such locations often requires input from the communities that view them as significant. Based on cultural resources studies and ongoing consultation with Indian Tribes and other interested parties (described in Chapter 4, *Consultation and Coordination*), no TCPs have been identified to date within the APE.

This analysis of potential impacts of the Proposed Action and alternatives to cultural resources relies on a literature review and archaeological pedestrian surveys conducted in May and June of 2009, October of 2012, and June of 2013. The methods and results of these studies are documented in the following Project-specific documents:

Duke, Daron, and Brandon Patterson. *Cultural Resources Inventory of 6,775 Acres for the Soda Mountain Solar Project, San Bernardino County, California.* BLM Report No. 680-09-24. November 2009.

McCabe, Allen. *Cultural Resources Inventory of an Additional 335 Acres for the Soda Mountain Solar Project.* BLM Report No. 680-09-24. February 2013.

Daub, Lindsay, and Daron Duke. *Cultural Resources Inventory of a Segment of the Blue Bell Mine Road, Soda Mountain Solar Project, San Bernardino County, California BLM Report No. 680-09-24.* July 2013.

3.6.1.1 Terminology

The Proposed Action is subject to NEPA, NHPA Section 106, and CEQA, among other laws, each of which requires that the state or federal lead agency take into account the effects of a project on cultural resources. However, NEPA, NHPA Section 106, and CEQA each use slightly different terminology to refer to historically significant cultural resources. Therefore, the following definitions of common terms used to discuss the regulatory requirements and treatment of cultural resources are provided:

Historic property: This term is used for the purposes of NEPA and NHPA Section 106, and is defined in 36 CFR Part 800, the implementing regulations for Section 106, as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register . . . , [which] includes artifacts, records, and remains that are related to and located within such properties." The term also includes "properties of traditional religious and cultural importance to an Indian tribe . . . that meet the National Register criteria" pursuant to 36 CFR Section 60.4 (36 CFR 800.16(*l*)(1)).

Historical resource: This term is used for the purposes of CEQA and is defined in CEQA Guidelines Section15064.5 as: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register; (2) a resource included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

Unique Archaeological Resource: This term is used for the purposes of CEQA and is defined in CEQA Guidelines Section 15064.5 as an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it either contains information needed to answer important scientific research questions; has a special and particular quality such as being the oldest of its type or the best available example of its type; or is directly associated with a scientifically recognized important prehistoric or historic event or person.

3.6.1.2 Area of Potential Effect

The regulations implementing NHPA Section 106 (36 CFR 800.16(d)) define the APE as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The APE is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16(d)). For purposes of complying with Section 106, the APE for the Project has been defined as a 4,234-acre area that includes the 4,179-acre ROW application area and an additional 57 acres outside the ROW application area that could be disturbed if the Alternative B Rasor Road realignment is approved. The APE includes the area of disturbance for all Project components, including the solar facility and all associated facilities, roads, and collector lines.

3.6.2 Regional and Local Environmental Setting

The Project site is located in north-central portion of the Mojave Desert, which is situated within the southern Basin and Range physiographic province. The terrain in this area consists of a series of broad, shallow southeast-trending valleys. Playas, or closed basin sinks, often exist on the valley floors. North-south trending weathered mountain ranges, rarely exceeding 4,000 feet in

elevation, surround the valleys. The elevation of the Project site ranges from 1,310 to 1,640 feet above mean sea level.

The Project site is located approximately 4 miles west of Soda Lake playa and approximately 7 miles southwest of the Silver Lake playa. The Soda Lake playa lies at the terminus of the Mojave River. The dry bed of the Mojave River Wash is located 6 miles to the south. During the Late Pleistocene to Early Holocene, the Mojave River filled Silver Lake and Soda Lake to overflow, creating a larger body of water named Lake Mojave. Lake Mojave dried up approximately 9,000 years before present (B.P.), although periods of wetter climate occasionally have filled the Soda Lake and Silver Lake basins (Enzel et al., 2003).

The Mojave Desert is characterized as an arid desert climate with low annual precipitation, low humidity, and relatively high temperatures. Winters are mild and summers are hot, with a large range in daily temperatures. Temperature and precipitation vary greatly with altitude, with higher temperatures and lower precipitation at low altitudes and lower temperatures and higher precipitation at higher altitudes. In the arid basins of the central Mojave Desert, annual precipitation rarely exceeds 5 centimeters.

The Project site is located within a valley that is surrounded on the east, west, and north by the Soda Mountains. No water sources are known to exist in this valley at the present time. In the Project vicinity, known Holocene-era water sources included Soda Springs (4 miles from the Project site), a number of smaller springs along the western shore of Soda Lake (4 miles from the Project site), the Mojave River (6 miles from the Project site), and, periodically, pluvial lakes such as the Cronese Lakes (3 miles from the Project site) and Lake Mojave (present-day Silver Lake and Soda Lake playas, described above) (Thomas, 2011). These water sources would have provided sufficient supply to the valley's prehistoric inhabitants.

The area also provided many sources of food for prehistoric people. Rodents, jackrabbits and cottontails, and occasionally deer and waterfowl would have been hunted. Mesquite, piñon nuts, live oak acorns, and Manzanita berries were all important plant food sources (Bean and Vane, 2002). Nearer to the Project site, riparian communities would have existed along the Mojave River and at springs, providing plant resources such as honey mesquite, screwbean mesquite, cattail, and tule reed (Thomas, 2011). Animals also would have been reliant on the same water sources, and could have been hunted there.

3.6.2.1 Cultural Setting

Prehistoric Setting

The prehistory of the Mojave generally is described in terms of cultural "complexes." A complex is a specific archaeological manifestation of a general mode of life, characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Complexes typically are associated with particular chronological periods (Table 3.6-1). The following cultural chronology is based on Sutton et al.'s (2007) synthesis.

TABLE 3.6-1
CULTURAL COMPLEXES

Time Period	Complex	Dates
Pleistocene	Paleo-Indian	10,000 – 8,000 B.C.
Early Holocene	Lake Mojave	8,000 – 6,000 B.C.
Middle Holocene	Deadman Lake	7,500 – 5,200 B.C.
	Pinto	6,000 – 3,000 B.C.
Late Holocene	Gypsum	2,000 B.C. – A.D. 200
	Rose Spring	A.D. 200 – 1100
	Late Prehistoric	A.D. 1100 to contact

SOURCE: Sutton et al., 2007: 236

Paleo-Indian (10,000 to 8,000 B.C.)

The Paleo-Indian period is sparsely represented in the Mojave, but is characterized primarily by large, fluted Clovis Projectile points. This limited evidence suggests that early human occupants of the Mojave probably lived in small, mobile groups in temporary camps on permanent water sources (Sutton et al., 2007).

Lake Mojave Complex (8,000 to 6,000 B.C.)

The name of this cultural complex was based on archaeological studies conducted along the margins of Pleistocene Lake Mojave. Lake Mojave sites have been found primarily around Fort Irwin, Lake Mojave, Lake China, Rosamond Lake, and Twentynine Palms, located near extinct water sources with the margins of pluvial lakes being the preferred settlement area. Subsistence and settlement patterns are likely to have been a direct response to climatic fluctuations occurring during the Pleistocene to Holocene transition. Lake Mojave populations were organized into relatively small, mobile groups and practiced a forager-like subsistence strategy. High mobility served to exploit ever-changing resource bases, coupled with a reliance on more permanent resources (water sources). Sites appear to have been repeatedly occupied, with artifact assemblages from both large and small sites being functionally identical (Sutton et al., 2007).

In terms of material culture, the Lake Mojave Complex is typified by stone tools such as Lake Mojave and Silver Lake projectile points, bifaces (stone tools with two worked faces), steep-edged unifaces (stone tools with one worked face), crescents (crescent-shaped stone artifacts), and some groundstone implements. A characteristic of Lake Mojave artifact assemblages is the frequent use of fine-grained volcanic lithic material in the production of flaked stone tools, while cryptocrystalline material was preferred for use in the production of other types of implements (Giambastiani and Bullard, 2007). The use of heavy projectile points, bifaces, and scrapers would suggest exploitation of large game. However, faunal assemblages and protein residue analyses from sites at Fort Irwin suggest heavy reliance on small game, such as rodents, reptiles, and lagomorphs (hares/rabbits/pikas). Ground stone wear is generally light, which suggests minor use of hard seeds.

Marine shell beads and non-local lithic materials indicate trade and/or long-distance resource procurement (Sutton et al., 2007).

Deadman Lake Complex (ca. 7,500 to ca. 5,200 B.C)

The Deadman Lake Complex is geographically restricted to Twentynine Palms in the southeastern Mojave Desert and appears to overlap with the Paleo-Indian and Pinto complexes (Sutton et al., 2007). Although still being fully defined, this complex is identified by artifact types including small- to medium-size contracting-stemmed or lozenge-shaped points, battered cobbles and core tools, bifaces, flaked tools, and milling equipment. Similar projectile points have been recovered from Ventana Cave in Arizona. Lithic materials include large quantities of coarse- to fine-grained igneous rock and smaller amounts of both local and exotic obsidian. *Olivella* shell beads are present, with both *O. biplicata* from the Pacific coast and *O. dama* from the Sea of Cortez represented.

The Pinto Complex (6,000 to 3,000 B.C.)

Archaeological deposits dating from this period suggest that Pinto settlement patterns consisted of seasonal occupation by small, semi-sedentary groups that were dependent upon a combination of big and small-game hunting and collection strategies, which could include the exploitation of stream or water resources. Typically, sites of this period are found along lakeshores and streams or springs, some of which are now dry, and in upland areas. Larger sites tend to be near well-watered locations, with smaller sites in other areas. In comparison to smaller sites, larger sites exhibit substantial midden deposits (deposits of organic material indicative of human settlement) and greater variation in artifact types. These larger sites were probably centralized locations from which foraging parties journeyed to seasonal resources (Sutton et al., 2007).

The extent of regional mobility at this time is uncertain. A lack of lithic material diversity might indicate that foraging activities were not as expansive as in the previous complex (Sutton et al., 2007). However, *Olivella* shell beads are still present, which indicates at least some degree of contact with coastal groups.

Material culture representative of this period include roughly formed projectile points, “heavy-keeled” scrapers, choppers, and a greater prevalence of flat millingstones and manos (groundstone tools used for grinding food and material) (Warren, 1984). Pinto series projectile points appear to have been frequently reworked, suggesting they were used primarily as spear, not dart, tips (Sutton et al., 2007).

Faunal assemblages are similar to those of the Lake Mojave Complex, with the exception of a slight increase in small fauna taxa (small animals) coupled with a decrease in artiodactyls (hoofed mammals) (Sutton et al., 2007). The rise of millingstones and manos indicates a more intensive use and processing of plant resources and site placement may have been in part based on access to plant resources. New dates indicate that intensive plant exploitation was occurring by ca. 7000 B.C. (Sutton et al., 2007).

At the end of the Middle Holocene, around 3,000 B.C., environmental conditions became much drier and hotter, and few sites in the Mojave date to the period between 3,000 and 2,000 B.C., suggesting that the area may have been largely abandoned during this period of unfavorable climate (Sutton et al., 2007).

Gypsum Complex (ca. 2,000 B.C. to A.D. 200)

The Late Holocene was characterized by a wetter and cooler climate than the Middle Holocene. Settlement patterns suggest small, temporary camps concentrated near streams. At the same time, there is more evidence of inter-tribal trade, particularly between the desert and the coast, and increasing social complexity (Sutton et al., 2007). The artifact assemblage associated with this period includes an increase in the prevalence of millingstones and manos, and it is believed that it was during this period that the pestle and mortar were introduced. These technological developments may point to the increased consumption of seeds and mesquite (Warren, 1984). Other artifacts associated with the Gypsum Period include Elko corner-notched series, concave base Humboldt series, and contracting-stemmed Gypsum series projectile points. Ritual activities are indicated by the presence of quartz crystals, paint, and rock art (Sutton et al., 2007). Toward the end of the Gypsum period, there is evidence for the use of the bow and arrow (Warren, 1984). Interestingly, there is a scarcity of Gypsum periods sites in the southern and eastern extent of the Mojave Desert (Sutton et al., 2007).

Rose Spring Complex (ca. A.D. 200 to 1200)

The general cultural pattern for this period is a continuation of that of the preceding Gypsum Period. The increase in cultural complexity continued into this period and the archaeological record attests to established trade routes between desert and coastal populations by way of shell beads and steatite, as well as an introduction of Anasazi influence as evidenced by the appearance of turquoise and pottery (Warren, 1984).

Archaeological sites from this period are more numerous and contain more well-developed middens, indicating an increase in population and a more permanent settlement pattern (Sutton et al., 2007). Additionally, evidence of structures such as pit houses also supports more permanent settlements. Sites tend to be located near springs, washes, and lakeshores (Sutton et al., 2007).

Material culture related to this period includes large quantities of obsidian artifacts, Rose Spring and Eastgate series projectile points, knives, drills, pipes, bone awls, millingstones, manos, mortars and pestles, marine shell ornaments, slate pendants, and incised stones (Sutton et al., 2007; Warren, 1984). The bow and arrow continued in use.

The Late Prehistoric Period (A.D. 1100 to European Contact)

By the Late Prehistoric period, an extensive network of established trade routes wound their way through the desert, routing trade goods to populations throughout the Mojave Region. It also is believed that these trade routes encouraged or were the motivating factors for increasingly complex socioeconomic and sociopolitical organization within Late Prehistoric peoples in Southern California. Housepit village sites are prevalent during this period, as are the presence of Desert series and Cottonwood projectile points, brownware and buffware ceramics, steatite shaft

straighteners, painted millingstones, and, to a lesser degree, coastal shell beads (Sutton et al., 2007; Warren, 1984).

Ethnographic Setting

Mojave oral tradition, supported by archaeological evidence, suggests that the Yuman-speaking Mojave Indians were also among the earliest residents in the Mojave Desert. Their territory included a large region including the Old Woman Mountains, Paiute Springs, New York Mountains, Granite Mountains, Soda Lake, and the eastern end of the Mojave River (Earle, 2005). At some point, between approximately 250 and 500 years ago, the Mojave left or were driven from this area to the Colorado River where they were documented by Father Francisco Garcés, a Spanish explorer, in 1776. Another Spanish explorer, Juan de Onate, may have observed this group as early as 1604 based on his descriptions of the "Mojave" people along the Colorado River (Kroeber, 1925).

At the time of European contact, the Project area was occupied by the several groups, including the Desert Chemehuevi group of the Southern Paiute and the Vanyume Serrano. The Chemehuevi comprised the Southern Numic portion of the Uto-Aztecan language family (Kroeber, 1925). The Chemehuevi inhabited the area between Needles, Blythe, Twentynine Palms, and the Colorado River, which contained the primary settlements. However, the Project site is located in an area that may have been utilized for seasonal resource exploitation, travel, and trade (Earle, 2005).

The oral tradition of the Chemehuevi suggests that they migrated from the north and engaged the Mojave group in a long war that drove the Mojave east to the Colorado River (Kroeber, 1925). Archaeological evidence indicates that the war ended between 250 and 500 years ago (King and Casebier, 1981). The Chemehuevi were divided into two moieties (kinship groups) represented by two songs, the Mountain Sheep Song and the Deer Song, which were associated with different hunting areas. They generally lived in bands of two or three families, each band having a leader.

The harsh desert environment could support only the smallest groups comprised of nuclear families joined by kinship ties. These small hunter-gatherer groups moved in response to local food and water availability, typically seasonally or more frequently. The lack of resources of the area created a very diverse hunting economy where small game was an important protein source. Pronghorn sheep, mountain sheep, deer, rabbits, squirrels, desert chipmunks, and wood rats were important mammals in the local diet along with reptiles, such as desert tortoises, snakes, and lizards, and birds, eggs and insects. Bighorn sheep and desert tortoise have traditionally been considered important animals to the Chemehuevi, as well as neighboring Cahuilla and Mojave peoples. Agriculture was introduced to the Chemehuevi by their eastern neighbors and they cultivated crops of various types of maize and corn, squash, gourds, wheat, and potatoes along the Colorado River (Kelly and Fowler, 1986).

The Chemehuevi utilized the paddle-and-anvil technique for their pottery, which included cooking pots, storage jars, spoons, scoops, and large vessels (Kelly and Fowler, 1986). They also utilized twining techniques for their basketry, which were used for transporting items, winnowing and parching, seed beating, boiling water, and storage. Other artifacts associated with the

Chemehuevi included the mano and millingstone (metate), mortar and pestle, digging sticks, and the sinew-backed bow with arrows of cane or willow. In addition to locally consumed trade goods, the Chemehuevi acted as “middle-men” in the long distance trade networks from groups to the west and the Pacific Coast and the Central Valley to the groups in the Southwest and along the Colorado River.

Following the Civil War, the traditional native subsistence base was threatened by the influx of settlers and accompanying livestock. With these resources unavailable, the Chemehuevi were employed on ranches, building railroads, and in the newly opened mines. The Chemehuevi were occupying the oasis of Mara (Twentynine Palms) when permanent settlement of the area by Europeans and Americans began. Livestock depleted natural resources and Euro-American settlers began to claim large pieces of land and water rights. In 1890, 160 acres were set aside for a reservation for the Chemehuevi. In 1910, 640 acres adjacent to the existing Cabazon reservation in Coachella was given jointly to the Cahuilla and the Chemehuevi, and those who remained on the Twentynine Palms reservation were encouraged to move there. Some went, some stayed, and others chose to settle elsewhere in California (Bean and Vane, 2002).

Serrano territory was bordered to the west roughly by the Cajon Pass in the San Bernardino Mountains, to the east by Twentynine Palms and to the south by Yucaipa Valley. Their territory extended north of the San Bernardino Mountains into the desert near Victorville, along the Mojave River. Serrano living along the Mojave River and in the desert were known as the Vanyume, and exhibited linguistic and cultural differences from the Serrano who inhabited the San Bernardino Mountains and surrounding areas (Earle, 2005). Francisco Garces, in his diaries from his 1776 expedition along the Mojave River, noted a Vanyume Serrano occupation at a spring on the east side of Soda Lake, and that this marked the eastern limits of their territory (Earle, 2005). Some Chemehuevi ethnographic sources confirm that Vanyume inhabited this area (Earle, 2005).

Serrano villages located at higher elevations were placed near canyons that received substantial precipitation or were adjacent to streams and springs. Villages situated at lower elevations were also located close to springs or in proximity to the termini of alluvial fans where the high water table provided abundant mesquite and shallow wells could be dug (Bean and Smith, 1978; Warren, 1984).

The Serrano were organized into clans, with the clan being the largest autonomous political entity. They lived in small villages where extended families lived in circular, dome-shaped structures made of willow frames covered with tule thatching. Each clan had one or more principal villages in addition to numerous smaller villages associated with the principal village (Price et al., 2008).

The Serrano subsistence strategy relied upon hunting and gathering, and occasionally fishing. Villages divided into smaller, mobile gathering groups during certain seasons to gather seasonally available foods. The division of labor was split between women gathering and men hunting and fishing (Bean and Smith, 1978; Warren, 1984). Mountain sheep, deer, rabbits, acorns, grass

seeds, piñon nuts, bulbs, yucca roots, cacti fruit, berries, and mesquite were some of the more common resources utilized (Bean and Smith, 1978; Warren, 1984).

Despite early European and Spanish contact in 1771, the Serrano remained relatively autonomous until the period between 1819 and 1834 when most of the western Serrano were removed and placed into missions (Bean and Smith, 1978; Warren, 1984). Today, there are two sovereign nations that claim a Serrano heritage: the federally-recognized San Manuel Band of Serrano Mission Indians, and the federally-recognized Morongo Band of Mission Indians, whose members represent Serrano, Cahuilla, and Cupeño cultures.

Historic Setting

Several major trails crossed the Mojave before and at the time of Spanish contact, and continued to be used not only by the native peoples but also by Euro-American explorers. The Yuma-Needles Trail ran from south of Yuma up the western side of the Colorado River to the Needles area. The Mojave Trail ran from Needles west across the desert to the coast, following the path of the Mojave River. This trail would have crossed the southern part of the Soda Lake basin and the Mojave Sink, located 7 miles to the south of the Project site. The Cocomaricopa Trail ran west from Arizona through the Salton Sink (Coachella Valley) and then northwest to meet the Mojave Trail near San Bernardino (Greene, 1983).

The first Europeans known to have visited the Mojave were Pedro Fages in 1772 and Juan Bautista de Anza and Father Francisco Garcés in 1774 (Greene, 1983). In 1775, Father Garcés separated from de Anza and crossed the Mojave along the ancient Mojave Trail from Needles west to the San Gabriel Mission, travelling past Soda Lake resting at modern-day Afton Canyon in 1776 (Earle, 2005). The establishment of Spanish missions that dotted the California coast never spread inland to the Mojave, and the desert remained relatively unexplored and unsettled by Europeans for much of the next century. The Romero-Estudillo Expedition of 1823-24 was an attempt by the Spanish to establish a secure route between the California Coast and Tucson; however, despite two attempts, the expedition never managed to make it as far as the Colorado River (Greene, 1983).

The first recorded American visitors to the Mojave were the party of Jedediah Smith, who crossed the Mojave along the Mojave Trail in 1826 (Greene, 1983). Ewing Young and Kit Carson followed his route in the 1820s and 1830s. Several American and Mexican military expeditions were conducted in the 1840s and 1850s. In 1829-1830, fur trader Antonio Armijo scouted a route between Santa Fe, New Mexico, and Los Angeles. This route became a trade route known as the congressionally designated Old Spanish National Historic Trail (Armijo Route), one branch of which passed near the Project site, along the same general route as the Mojave Trail (Greene, 1983; BLM, 2006). After California became an American state in 1850, government-funded exploration and mapping of the region began, with the first major survey completed in 1853.

In 1848 gold was discovered by James W. Marshall at Coloma, some 400 miles to the north on the American River. The gold rush began and immigrants flooded into California, many headed to or through the Mojave Desert. By the late 1850s, the Mojave and Old Spanish trails had

become major freight and mail roads. In addition, due to conflicts along the Colorado River between the federal government, Mormon settlers, and Native peoples, the U.S. Army established a series of forts along the Mojave Trail, including one at Soda Lake. The Mojave Trail became the major east-west travel route between Los Angeles and the Colorado River, and was known during this period as the Old Government Road (Greene, 1983).

The discovery of the Comstock Lode in Nevada in 1859 shifted attention from gold to silver, and miners began to focus on the desert regions (Vredenburgh, 2005). The 1880s were fairly prosperous for mining in the Mojave Desert, and operations at that time were dominated by gold and silver mining. In the 20th century, mining operations shifted focus to borax, zinc, and silver. Productivity fell off in the 1920s due to increased inflation, but was revived during the Great Depression; however, gold mining virtually ceased during World War II. By 1956, the declining gold prices caused most remaining small gold operations to close (Shumway et al., 1980).

Approximately 3 miles northwest of the Project site, the Bluebell silver mine, part of the Solo Mining District, was established in 1885 and continued operating well into the 20th century. Transportation of goods to and from the Bluebell Mine, along with other mines in the region, was facilitated by the construction of the Tonopah & Tidewater (T&T) Railroad in 1904-1907 (Myrick, 1963). The T&T Railroad operated between Goldfield and Ludlow until 1940. By 1943, all rails and tracks had been removed.

The Arrowhead Trail Highway (State Route 31), one of the earliest automobile roads through the Mojave Desert, was constructed between 1917 and 1924. The road connected Los Angeles with Salt Lake City, Utah. In 1933 much of the Arrowhead Trail Highway between Barstow, California and the California-Nevada state line was incorporated into State Route 91 (later Interstate 15) (Lyman, 1999). It was at this time that the portion of the Arrowhead Trail Highway that bisects the Project site went out of use as traffic was diverted to State Route 91, located about 1 mile to the northwest.

The San Bernardino-Boulder Dam 115 kV transmission line was built in 1930-1931 by Southern Sierras Power Company and the Nevada-California Power Company. The transmission line was constructed to transport power from the Boulder Dam (now Hoover Dam), located near the Colorado River approximately 35 miles southeast of Las Vegas, Nevada, to the Los Angeles area (Hatheway, 2006). In 1928, President Coolidge signed a bill approving the Boulder Canyon Project, and the following year, the Boulder Canyon Project Act was passed, facilitating the development of the Hoover Dam. However, before dam construction, a source of electricity was needed. Instead of building a new power plant near the dam site, it was determined more cost-effective to transport power from existing plants in Southern California. Between 1930 and 1931, the Southern Sierras Power Company and the Nevada-California Power Company constructed a 225-mile-long power transmission line from San Bernardino to the construction site via a substation located at Boulder City (Hatheway, 2006). The San Bernardino-Boulder Dam 115V transmission line passes within 500 feet of the Project site and is currently owned by Southern California Edison (SCE) and operated as the Eldorado-Mountain Pass-Baker-Dunn Siding-Coolwater-Kramer 115 kV transmission line.

3.6.2.2 Cultural Resources Identified Through Native American Consultation

By letter on August 21, 2012, the BLM invited Indian Tribes to consult on a government-to-government basis and as part of NHPA Section 106 consultation and other relevant laws, regulations, and policies (described in detail in Chapter 4, *Consultation and Coordination*). The letters requested assistance from the Tribes in identifying any issues or concerns about the Project, including the identification of sacred sites and places of traditional religious and cultural significance that might be affected. Letters were sent to the following tribes: Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Las Vegas Tribe of Paiute Indians, Moapa Band of Paiute Indians, San Manuel Band of Mission Indians, Timbisha Shoshone Tribe, and the Twenty-Nine Palms Band of Mission Indians.

3.6.2.3 Identified Cultural Resources

This subsection provides the results of inventories conducted to identify cultural resources within the APE, including literature and records searches (California Historical Resources Information System [CHRIS] and local records), historic map research, and field investigations.

Previous Research

As part of this study, a records search was conducted at the San Bernardino Archaeological Information Center (SBAIC) in Redlands. The records search area included the Project site and a 1-mile buffer zone (records search study area). USGS topographic quadrangle base maps on file at the SBAIC were reviewed to identify previously documented cultural resources and cultural resources investigations completed within the records search study area. A supplemental review of general land ordinance (GLO) maps depicting potential historical sites and properties within the APE also was conducted. The records and literature search results indicated that a total of 24 previous investigations had been conducted within the records search study area, of which nine included portions of the APE.

Sixteen previously recorded cultural resources were identified within the records search study area. Most of the resources identified are prehistoric rock and linear features, such as cleared circles, rock alignments, and trail segments. Of the previously recorded resources, one is located within the APE. This resource is CA-SBR-7689H, the Arrowhead Trail Highway, which was established between 1917 and 1924 and used until about 1933 when nearby State Route 91/ U.S. 466 (later I-15) was constructed. Between Barstow, California and the California-Nevada state line, much of the Arrowhead Trail was incorporated into State Route 91.

Archaeological Survey

A pedestrian archaeological survey of the APE was conducted between May 26 and June 13, 2009; between October 9 and October 12, 2012; and on June 26, 2013. Because the initial survey was conducted prior to the reduction in the ROW application area, a total of 7,124 acres was subject to intensive pedestrian survey, which includes the entire APE. Survey crews walked linear transects spaced at 15-meter intervals. Archaeological sites were defined as a cluster of three or

more artifacts found within a 5-by-5-meter area. In addition, single features such as rock rings or rock alignments were considered "sites". Any resource that did not meet these criteria was designated an "isolate." Archaeological sites were recorded on standard California Department of Parks and Recreation (DPR) 523 forms. All previously recorded sites that fell within survey quadrants were reexamined and additional information recorded as warranted so their DPR forms could be updated. Scaled sketch maps were drawn for all sites. Each site datum was plotted with a GPS unit, and site sketch maps were made with a combination of GPS units and compass and pace/tape methods. No subsurface investigation was performed, and no artifacts were collected.

As a result of the archaeological surveys, a total of 12 archaeological sites and 77 isolates were recorded. Of these, five archaeological sites and 52 isolates are located within the APE. Three of the five archaeological sites are related to historic-era transportation, while the remaining two archaeological sites are prehistoric sites including a flaked stone scatter and a cleared circle.

The BLM has made eligibility determinations for those resources that are located within the APE. The BLM has determined that none of the five resources and none of the 52 isolates located within the APE are eligible for listing in the National Register. These resources likewise are not eligible for listing in the California Register and are not considered historical resources or unique archaeological resources under CEQA.

TABLE 3.6-2
ARCHAEOLOGICAL SITES RECORDED WITHIN THE APE

Resource designation	Date	Description	Newly or Previously Recorded	National Register/California Register Eligibility	CEQA Significance
CA-SBR-7689H	1917-1933	4.5-mile segment of the Arrowhead Trail Highway	Previously recorded	Entire resource may be eligible for listing in National Register/California Register; however, segment within Project site not a contributor	Segment within Project site not significant
CA-SBR-13345	Prehistoric	Flaked stone scatter, cryptocrystalline silicate flakes, core, and biface	Newly recorded	Not eligible	Not significant
CA-SBR-13348	1915-1955	Historic-era site related to Arrowhead Highway; tent pads, roadside garage foundation, gravel processing area, and historic debris dumps	Newly recorded	Not eligible	Not significant
CA-SBR-13349	Prehistoric	Cleared circle, no associated artifacts	Newly recorded	Not eligible	Not significant
CA-SBR-13352H	1880s-present	Segment of road to Bluebell Mine	Newly Recorded	Not eligible	Not significant

TABLE 3.6-3
ISOLATED ARTIFACTS RECORDED WITHIN THE APE

Resource designation	Prehistoric/ Historic (P/H)	Description	National Register/ California Register Eligibility	CEQA Significance
IA-03	H	Glass bottle	Not eligible	Not significant
IA-04	H	Evaporated milk can	Not eligible	Not significant
IA-05	P	Core	Not eligible	Not significant
IA-06	P	SRL	Not eligible	Not significant
IA-07	P	SRL	Not eligible	Not significant
IA-08	H	Evaporated milk can	Not eligible	Not significant
IB-01	H	Gas can	Not eligible	Not significant
IB-02	H	M-shaped rock alignment	Not eligible	Not significant
IB-03	P	Flake tool	Not eligible	Not significant
IB-04	H	Automotive can	Not eligible	Not significant
IB-07	H	Gas can	Not eligible	Not significant
IB-08	P	Flake	Not eligible	Not significant
IB-09	P	Flake	Not eligible	Not significant
ID-01	H	Evaporated milk can	Not eligible	Not significant
ID-02	H	Evaporated milk can	Not eligible	Not significant
ID-03	H	Evaporated milk can	Not eligible	Not significant
ID-04	H	Evaporated milk can	Not eligible	Not significant
ID-05	H	Survey benchmark	Not eligible	Not significant
ID-06	H	Evaporated milk can	Not eligible	Not significant
ID-07	H	Can	Not eligible	Not significant
ID-08	J	Gas can	Not eligible	Not significant
ID-09	P	Rose Spring projectile point	Not eligible	Not significant
ID-10	H	Rubber tire	Not eligible	Not significant
ID-11	H	Explosive powder can	Not eligible	Not significant
ID-12	H	Paint can	Not eligible	Not significant
ID-13	H	Sanitary can	Not eligible	Not significant
ID-14	H	Sanitary can	Not eligible	Not significant
ID-15	H	Beverage can	Not eligible	Not significant
ID-16	H	Beverage can	Not eligible	Not significant
ID-17	H	Fuel can	Not eligible	Not significant
ID-18	H	Sanitary can	Not eligible	Not significant
ID-19	H	Automotive can	Not eligible	Not significant
ID-20	H	Fuel can	Not eligible	Not significant
ID-21	H	Sanitary can	Not eligible	Not significant
ID-22	H	Mechanical part	Not eligible	Not significant
ID-23	H	Evaporated milk can	Not eligible	Not significant
ID-24	H	Evaporated milk can	Not eligible	Not significant
ID-25	H	Fuel can	Not eligible	Not significant
ID-26	H	Evaporated milk can	Not eligible	Not significant
ID-27	H	Glass bottle	Not eligible	Not significant
ID-28	H	Evaporated milk can	Not eligible	Not significant
ID-29	H	Glass bottle	Not eligible	Not significant
ID-30	H	Evaporated milk can	Not eligible	Not significant
IJ-06	Unknown	Knife-cut mammal bone	Not eligible	Not significant
IJ-15	H	Rock cairn and section corner marker	Not eligible	Not significant
IJ-17	P	SRL	Not eligible	Not significant
ISO-A1	H	Metal container	Not eligible	Not significant

TABLE 3.6-3 (Continued)
ISOLATED ARTIFACTS RECORDED WITHIN THE APE

Resource designation	Prehistoric/ Historic (P/H)	Description	National Register/ California Register Eligibility	CEQA Significance
ISO-A3	H	Hole-in-cap can	Not eligible	Not significant
ISO-A4	P	Flake tool	Not eligible	Not significant
ISO-A5	H	Shattered bottle	Not eligible	Not significant
ISO-A6	H	Meat can	Not eligible	Not significant
ISO-A7	H	Two food cans	Not eligible	Not significant

SRL = Segregated Reduction Location, a single-core lithic reduction event location

3.6.3 Applicable Regulations, Plans, and Standards

3.6.3.1 Federal

There are numerous federal regulations, executive orders, and policies that direct management of cultural resources on federal lands and by federal agencies. These include NEPA, the NHPA, the American Indian Religious Freedom Act (AIRFA), Executive Order 13007, the Native American Graves Protection and Repatriation Act (NAGPRA), and the CDCA Plan. The following is a discussion of the most pertinent laws affecting the Project.

National Environmental Policy Act

NEPA establishes national policy for the protection and enhancement of the environment. Part of the function of the federal government in protecting the environment under NEPA is to “preserve important historic, cultural and natural aspects of our national heritage” (42 USC §4331(b)) and to provide for public participation in the consideration of cultural resource issues, among others, during agency decision making.

Under NEPA, in determining whether a federal action “significantly” affects the quality of the human environment federal lead agencies consider the unique characteristics of the affected geographic area, such as proximity to “historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas” (40 CFR 1508.27(b)(3)), or the degree to which the action may adversely affect “districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places” or may cause loss or destruction of “significant scientific, cultural, or historical resources” (40 CFR 1508.27(b)(8)).

National Historic Preservation Act Section 106

The principal federal law addressing historic properties is the NHPA, as amended (16 USC §470f), and its implementing regulations (36 CFR Part 800). Section 106 requires a federal agency with jurisdiction over a proposed federal action (referred to as an “undertaking” under the NHPA) to take into account the effects of the undertaking on historic properties, and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The

Project is an undertaking with the potential to affect historic properties (36 CFR 800.3(a)), and therefore is subject to compliance with the requirements of the Section 106 process.

The term "historic properties" refers to "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register" (36 CFR 800.16(*l*)(1)). The implementing regulations (36 CFR Part 800) describe the process for identifying and evaluating historic properties, for assessing the potential adverse effects of federal undertakings on historic properties, and seeking to develop measures to avoid, minimize, or mitigate adverse effects. The Section 106 process does not require the preservation of historic properties; instead, it is a procedural requirement mandating that federal agencies take into account effects to historic properties from an undertaking prior to approval.

The steps of the Section 106 process are accomplished through consultation with the State Historic Preservation Office (SHPO), federally-recognized Indian tribes, local governments, and other interested parties. The goal of consultation is to identify potentially affected historic properties, assess effects to such properties, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties. The agency also must provide an opportunity for public involvement (36 CFR 800.1(a)). Consultation with Indian tribes regarding issues related to Section 106 and other authorities (such as NEPA and Executive Order No. 13007) must recognize the government-to-government relationship between the Federal government and Indian tribes, as set forth in Executive Order 13175, 65 FR 67249 (Nov. 9, 2000), and Presidential Memorandum of Nov. 5, 2009.

National Register of Historic Places

The National Register was established by the NHPA, as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). The National Register recognizes both historical-period and prehistoric archaeological properties that are significant at the national, state, and local levels. As indicated in NHPA Section 101(d)(6)(A) (16 USC §470a(d)(6)(A)), properties of traditional religious and cultural importance to a tribe are eligible for inclusion in the National Register.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (36 CFR 60.4):

1. Are associated with events that have made a significant contribution to the broad patterns of our history;
2. Are associated with the lives of persons significant in our past;
3. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
4. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional importance, it must be at least 50 years old to be eligible for National Register listing (36 CFR 60.4).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (NPS, 1995). The National Register recognizes seven qualities that, in various combinations, define integrity: location, design, setting, materials, workmanship, feeling, and association. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance (36 CFR 60.4).

American Indian Religious Freedom Act

AIRFA (42 USC §1996), enacted in 1978, establishes a policy of federal protection and preservation of traditional religions of Native Americans, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Executive Order 13007

Executive Order 13007 (61 FR 26771; May 29, 1996) directs federal agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions: to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of sacred sites. It also requires agencies to maintain the confidentiality of sacred sites, where appropriate.

Native American Graves Protection and Repatriation Act

Requirements for responding to discoveries of Native American human remains and associated funerary objects on federal land are addressed under the NAGPRA (Public Law 101-601, 25 USC §3001) and its implementing regulations found at 43 CFR Part 10. If a planned activity may result in the excavation of Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony on federal or tribal lands, a federal agency must prepare a written Plan of Action (POA), in consultation with Indian tribes, which outlines the planned treatment, care, handling, and disposition of human remains funerary objects, sacred objects, or objects of cultural patrimony (43 CFR 10.3(c)(2)).

CDCA Plan

The CDCA Plan requires that all areas within the CDCA be managed to preserve and protect archaeological values and that, where applicable, NHPA implementing regulations, described above, be implemented. Additionally, the CDCA Plan requires that Native American cultural and religious values be preserved where relevant and protected where applicable, and that Native American groups be consulted (BLM, 1999, Table 1).

BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (Public)

This manual provides the line manager and program staff professionals with policies for the management of National Scenic and Historic Trails (e.g, the Old Spanish National Historic Trail). Specifically, this manual identifies requirements for the management of trails undergoing National Trail Feasibility Study; trails that are recommended as suitable for National Trail designation through the National Trail Feasibility Study; inventory, planning, management, and monitoring of designated National Scenic and Historic Trails; and data and records management requirements for National Scenic and Historic Trails (BLM, 2012a).

3.6.3.2 State

The State implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs (16 USC §470b). The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Public Resources Code §5024.1(a)). The criteria for eligibility for the California Register are based upon National Register criteria. Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a prehistoric or historical-period property must be significant at the local, State, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history (Public Resources Code §5024.1(c)).

A resource eligible for the California Register must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be

recognizable as a historical resource and to convey the reason for its significance (14 Cal. Code Regs. §4852(c)). It is possible that a historic resource may not retain sufficient integrity to meet the criteria for listing in the National Register, but it may still be eligible for listing in the California Register.

Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

1. California properties listed on the National Register and those formally Determined Eligible for the National Register;
2. California Registered Historical Landmarks from No. 770 onward; and
3. Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion in the California Register (Public Resources Code §5024.1(d)).

Other resources that may be nominated to the California Register include:

1. Historical resources with a significance rating of Category 3 through 5 (Those properties identified as eligible for listing in the National Register, the California Register, and/or a local jurisdiction register);
2. Individual historical resources;
3. Historical resources contributing to historic districts; and,
4. Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone (Public Resources Code §5024.1[e]).

California Environmental Quality Act

Under CEQA (Public Resources Code §21084.1), a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. CEQA Guidelines Section 15064.5 recognize that an historical resource includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register; (2) a resource included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record. The fact that a resource does not meet the three criteria outlined above does not preclude the CEQA lead agency from determining that the resource may be an historical resource as defined in Public Resources Code Sections 5020.1(j) or 5024.1.

If a CEQA lead agency determines that an archaeological site is a historical resource, the provisions of Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5 apply. If a project may cause a substantial adverse change (defined as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired) in the significance of an historical resource, then the lead agency must identify potentially feasible measures to mitigate these effects (CEQA Guidelines §§15064.5(b)(1), 15064.5(b)(4)).

If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated as a unique archaeological resource in accordance with the provisions of CEQA (Pub. Res. Code §21083). As defined in Section 21083.2, a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological site meets the criteria for a unique archaeological resource as defined in Section 21083.2, then the site is to be treated in accordance with the provisions of Section 21083.2, which state that if the lead agency determines that a project would have a significant effect on unique archaeological resources, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place (Pub. Res. Code §21083.1(a)). If preservation in place is not feasible, mitigation measures are required.

If an archaeological resource is neither a unique archaeological nor a historical resource, then the effects of the project on those resources are not be considered to be a significant effect on the environment for purposes of CEQA (CEQA Guidelines §15064.5(c)(4)).

3.6.3.3 Local

San Bernardino County General Plan

The Conservation Element of the San Bernardino County General Plan (2007) governs the natural and cultural resources of the County. The San Bernardino County General Plan has the following relevant goals and policies related to the protection of cultural resources.

> **Goal CO 3.** The County will preserve and promote its historic and prehistoric cultural heritage.

Policy CO 3.1. Identify and protect important archaeological and historic cultural resources in areas of the County that have been determined to have known cultural resource sensitivity.

Policy CO 3.2. Identify and protect important archaeological and historic cultural resources in all lands that involves disturbance of previously undisturbed ground.

Programs

1. Require the Archaeological Information Center at the San Bernardino County Museum to conduct a preliminary cultural resource review prior to the County's application acceptance for all land use applications in planning regions lacking Cultural Resource Overlays and in lands located outside of planning regions.
2. Should the County's preliminary review indicate the presence of known cultural resources or moderate to high sensitivity for the potential presence of cultural resources, a field survey and evaluation prepared by a qualified professional will be required with Project submittal.

Policy CO 3.5. Ensure that important cultural resources are avoided or minimized to protect Native American beliefs and traditions.

Programs

5. b. The concerns of the Native American community will be fully considered in the planning process.

   c. If human remains are encountered during grading and other construction excavation, work in the immediate vicinity will cease and the County Coroner will be contacted pursuant to the state Health and Safety Code.

   d. In the event that Native American cultural resources are discovered during Project development and/or construction, all work in the immediate vicinity of the find will cease and a qualified archaeologist meeting US Secretary of Interior standards will be hired to assess the find. Work on the overall Project may continue during this assessment period.

   e. If Native American cultural resources are discovered, the County will contact the local tribe. If requested by the tribe, the County will, in good faith, consult on the discovery and its disposition with the tribe.

The following goals and policies are specific to the Desert Region of San Bernardino County:

Goal D/CO 6. Protect cultural and paleontological resources within the Desert Region.

Policy D/CO 6.1. Identify and protect significant cultural resources from damage or destruction.

Policy D/CO 6.2. Inventory Cultural Resources, encouraging inputs from the local historical society and committees.

3.6.4 Analytical Methodology

Evaluation of potential impacts of the Proposed Action and alternatives on cultural resources is based in part on review of legal responsibilities established under NEPA, the NHPA, CEQA, and other relevant authorities. For purposes of NEPA, this Draft PA/EIS/EIR includes information gathered as part of the NHPA Section 106 process about historic properties and the potential effects to such properties from the proposed undertakings, i.e., the BLM's decision whether or not to issue the requested ROW grant or approve a CDCA Plan Amendment.

The basic process for assessing impacts on cultural resources under applicable federal and state laws (NEPA, NHPA Section 106, and CEQA) consists generally of the following five steps, which are followed in this analysis (36 CFR 800.4; 43 CFR 800.5; 43 CFR 800.6):

1. Determine the appropriate geographic extent of the analysis for the proposed action and for each alternative action under consideration;
2. Identify cultural resources located within each such geographic area;
3. Determine the historical significance of the cultural resources in the inventory for each geographic area;
4. Assess the character and the severity of the effects of the proposed and alternative actions on cultural resources (NEPA) and on historically significant cultural resources (NEPA, NHPA Section 106, and CEQA); and
5. Develop measures that would avoid, minimize, or mitigate those effects that are found to be significant.

Further details of each of these steps follow and help provide the parameters of the present analysis.

Area of Potential Effects/Geographic Extent of Analysis

As described in Section 3.6.1.2, the APE for the Project has been defined as a 4,234-acre area that includes the 4,179-acre ROW application area and an additional 57 acres outside the ROW application area that could be disturbed if the Alternative B Rasor Road realignment is approved. The APE includes the area of disturbance for all Project components, including the solar facility and all associated facilities, roads, and collector lines.

Identification of Cultural Resources

As described above, cultural resource inventories were conducted to identify cultural resources within the Project site and surrounding area, and included literature and records searches, historic map research, and field investigations. As a result of the archaeological surveys, a total of five archaeological sites and 52 isolates were recorded or updated within the APE.

Evaluation of Historical Significance

A key part of any cultural resources analysis under NEPA, NHPA Section 106, and CEQA is to determine whether the cultural resources that a proposed action or alternative may affect directly or indirectly are historically significant.

NEPA

Under NEPA, in determining whether a federal action "significantly" affects the quality of the human environment federal lead agencies consider the unique characteristics of the affected geographic area, such as proximity to "historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, and ecologically critical areas" (40 CFR 1508.27(b)(3)), or the degree to which the action may adversely affect "districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places" or may cause loss or destruction of "significant scientific, cultural, or historical resources" (40 CFR 1508.27(b)(8)).

Cultural resources need not be determined eligible for the National Register to receive consideration under NEPA. NEPA requires consideration of impacts to both National Register-eligible resources and cultural resources. (40 CFR 1508.27(b)(3); 40 CFR 1508.27(b)(8))

NHPA Section 106

Effects on historic properties are considered chiefly under NHPA Section 106 through its implementing regulations, 36 CFR Part 800. This includes consideration of effects on properties of traditional religious and cultural importance to Indian tribes. Section 106 requires federal agencies to take into account the effects of their undertakings on any historic district, site, building, structure, or object that is included in or eligible for inclusion in the National Register and to afford the ACHP a reasonable opportunity to comment on such undertakings (36 CFR 800.1(a)). Consultation with Indian Tribes, SHPO, ACHP, and interested parties is required throughout the Section 106 process (36 CFR 800.2(a)(4); 36 CFR 800.1(c))

The BLM has made National Register determinations of eligibility and findings of effect for all cultural resources within the APE (see Table 3.6-2 and Table 3.6-3) and has requested SHPO concurrence with those determinations and findings. The BLM has determined that none of the five archaeological resources or 52 isolates located within the APE is eligible for listing in the National Register, and has made a finding that there would be no effect to historic properties as a result of the Proposed Action or alternatives.

CEQA

CEQA requires San Bernardino County, as the state lead agency, to evaluate the significance of cultural resources by determining whether or not they meet several sets of specified criteria. Under CEQA, the definition of a significant cultural resource (or "historical resource") is that it is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register," or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code," or "any object, building, structure, site, area,

place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (14 Cal. Code Regs. §15064.5(a)). If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated as a unique archaeological resource in accordance with the provisions of Public Resources Code Section 21083.

Assessing Effects to Cultural Resources

NEPA and NHPA Section 106

NEPA requires federal agencies to take a "hard look" at the effects on cultural resources associated with a proposed action and alternatives. The analysis takes into account direct, indirect, and cumulative effects on cultural resources regardless of whether they are listed in or eligible for the National Register. The agency must consider the geographic, biophysical, and social context in which the effects will occur, and intensity (severity) of the impact (40 CFR 1508.27).

For those cultural resources that the BLM has identified as historic properties eligible for or listed in the National Register, the Section 106 implementing regulations describe an adverse effect as an effect "found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." (36 CFR 800.5(a)(1)). This consideration should apply to all the qualifying characteristics of an historic property. Adverse effects also may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects include, but are not limited to:

i. Physical destruction of or damage to all or part of the property;

ii. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

iii. Removal of the property from its historic location;

iv. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

v. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

vi. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

vii. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance. (36 CFR 800.5(a)(2)).

CEQA

According to CEQA Guidelines Section 15064.5, a project with an effect that may cause a substantial adverse change in the significance of a historical resource may have a significant effect on the environment. The CEQA Guidelines further state that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historic resource would be materially impaired. Actions that would materially impair the significance of a historical resource are any actions that would demolish or adversely alter those physical characteristics of a historical resource that convey its historical significance and qualify it for inclusion in the California Register or in a local register or survey that meet the requirements of Public Resources Code Sections 5020.1(k) and 5024.1(g). A lead agency must also take into account impacts to unique archaeological resources.

Resolving Significant Impacts/Adverse Effects

Once impacts to cultural and historical resources have been identified, the final phase of a cultural resources analysis is to seek ways to resolve those impacts of a proposed action or alternative that have been found to be significant or adverse. The terminology used to describe the process of impacts resolution differs between NEPA, NHPA Section 106, and CEQA. Mitigation under NEPA includes the development of measures that would avoid, minimize, rectify, reduce or eliminate an impact over time, or provide compensation for such impact (40 CFR 1508.20). NHPA Section 106 process requires that the lead agency consult with the SHPO/THPO and other consulting parties, including Indian tribes and Native Hawaiian organizations, to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties (36 CFR 800.6(a)). CEQA requires that mitigation measures be developed to mitigate impacts to a less than significant level, where feasible.

3.6.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address potential impacts to cultural resources.

3.6.6 Direct and Indirect Effects

3.6.6.1 Alternative A: Proposed Action

Construction

Project-related construction activities, including grading, trenching, installation of solar arrays, and construction of access roads and buildings, have the potential to affect cultural resources. Five archaeological sites and 52 isolates are located within the Project APE (see Section 3.6.2.3).

Because some areas within the APE do not have project components proposed and will not be subject to ground disturbance, the Proposed Action would directly impact a total of 4 of the sites and 36 of the isolates.

None of these sites and isolates identified within the APE are eligible for listing in the National Register or California Register. No built historical resources have been identified in the APE. Therefore, there would be no impact to resources that are listed in or eligible for listing in the National Register or California Register.

NHPA Section 106 and government-to-government consultation with interested Indian tribes is on-going, as described in detail in Chapter 4, *Consultation and Coordination*. To date, no places to which tribes attach cultural or religious significance have been identified related to the Proposed Action.

Project construction could unearth, expose, or disturb subsurface archaeological, historic, or Native American resources that may not have been apparent on the surface and that may be eligible for listing in the National Register or California Register. In this event, the protocol for discovery of human remains, described below, would be followed. The implementation of **Mitigation Measures 3.6-1 through 3.6-3**, which require the retention of a qualified archaeologist, cultural resources sensitivity training, the implementation of a Cultural Resources Discovery and Monitoring Plan, and provisions for the inadvertent discovery of human remains, would ensure that this protocol would be followed correctly and reduce impacts to inadvertently discovered cultural resources.

Protocol for Discovery of Human Remains in California

The following discussion describes the protocol for the treatment of discovered human remains under both federal and state law. All discovered human remains shall be treated with respect and dignity. California state law (California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98) and federal law and regulations (Archaeological Resources Protection Act (ARPA, 16 USC §470 and 43 CFR Part 7) and NAGPRA (25 USC §3001 and 43 CFR Part 10)) require a defined protocol if human remains are discovered in the state of California regardless of whether the remains are modern or archaeological.

Upon discovery of human remains in California, all work in the area must cease immediately and the area must be secured. The San Bernardino County Coroner’s Office and the BLM must then be called and informed of the discovery. The Coroner has two working days after notification to examine the remains and determine if the bones are historic/archaeological or a modern legal case. The remains and the area around them must remain undisturbed to avoid the disturbance of a burial site or crime scene. Federal and state criminal and/or civil penalties, including fines and/or jail time, may be assessed for disturbing human remains. In addition, all vehicles and equipment used in the commission of the crime may be forfeited.

If the Coroner's Office determines the remains are of modern origin, the appropriate law enforcement officials will be called by the Coroner and conduct the required procedures. Work will not resume until law enforcement has released the area.

If the remains are determined to be archaeological in origin and there is no need for law enforcement, the appropriate Field Office Archaeologist must be called. The archaeologist would then initiate the proper procedures under ARPA and/or NAGPRA. If the remains can be determined to be Native American, the steps as outlined in NAGPRA, 43 CFR 10.6 *Inadvertent discoveries*, must be followed.

Operation and Maintenance

The primary potential for direct impacts to cultural resources during operation and maintenance is from unanticipated damage of inadvertently discovered archaeological, historic, and Native American resources. **Mitigation Measures 3.6-1 through 3.6-3** would reduce impacts to these resources. Because operation and maintenance activities would be limited to the approved construction footprint of the Project, no additional direct or indirect impacts to cultural resources would be expected.

Decommissioning

The primary potential for direct impacts to cultural resources during decommissioning of the Project under the Proposed Action is from unanticipated damage of inadvertently discovered archaeological, historic or Native American resources. **Mitigation Measures 3.6-1 through 3.6-3** would reduce impacts to these resources. Because decommissioning activities would be limited to the approved construction footprint of the Project, no additional direct impacts to cultural resources would be expected.

3.6.6.2 Alternative B

With the exception of the alternative Rasor Road realignment, this alternative is located entirely within the footprint of the Proposed Action as shown in Figure 2-5, and, therefore, the environmental setting described in Section 3.6.2 also applies to this alternative.

Cultural resource surveys completed by the Applicant identified three archaeological sites and 31 isolates within the Alternative B footprint. None of these resources have been determined eligible for listing in the National Register or California Register. The number of sites within the Alternative B footprint is reduced by one, and the number of isolates by five, compared to the Proposed Action, due to the smaller size of Alternative B’s footprint. Similar to the Project, construction of Alternative B has the potential to unearth, expose, or disturb subsurface archaeological, historic, or Native American resources that may not have been apparent on the surface. However, the implementation of **Mitigation Measures 3.6-1 through 3.6-3** would minimize impacts to cultural resources. Potential impacts to unknown cultural resources would be further reduced by Alternative B relative to the Proposed Action because only two wells (instead of three) would be drilled for Alternative B.

3.6.6.3 Alternative C

This alternative is located entirely within the footprint of the Proposed Action as shown in Figure 2-6, and, therefore, the environmental setting described in Section 3.6.2 also applies to this alternative.

Cultural resource surveys completed by the Applicant identified four archaeological sites and 31 isolates within the Alternative C footprint. None of these resources has been determined eligible for listing in the National Register or California Register. The number of isolates within the Alternative C footprint is reduced by five compared to the Proposed Action, due to the smaller size of Alternative C's footprint. Similar to the Proposed Action, construction of Alternative C has the potential to unearth, expose, or disturb subsurface archaeological, historic, or Native American resources that may not have been apparent on the surface. However, the implementation of **Mitigation Measures 3.6-1 through 3.6-3** would minimize impacts to cultural resources. Potential impacts to unknown cultural resources would be further reduced by Alternative C relative to the Proposed Action because only two wells (instead of three) would be drilled for Alternative C.

3.6.6.4 Alternative D

This alternative is located entirely within the footprint of the Proposed Action as shown in Figure 2-7, and, therefore, the environmental setting described in Section 3.6.2 also applies to this alternative.

Cultural resource surveys completed by the Applicant identified two archaeological sites and 27 isolates within the Alternative D site footprint. None of these resources has been determined eligible for listing in the National Register or California Register. The number of isolates within the Alternative D footprint is reduced by two, and the number of isolates by nine, compared to the Proposed Action, due to the smaller size of Alternative D's footprint. Similar to the Proposed Action, construction of Alternative D has the potential to unearth, expose, or disturb subsurface archaeological, historic, or Native American resources that may not have been apparent on the surface. However, the implementation of **Mitigation Measures 3.6-1 through 3.6-3** would minimize impacts to cultural resources.

3.6.6.5 Alternative E: No Action/No Project

Under this No Action/No Project Alternative, the Project would not be approved by the BLM, the BLM would not amend the CDCA Plan, and the County would not approve the requested groundwater well permit application. As a result, the Project would not be constructed and BLM would continue to manage the Project site consistent with the site's multiple use classifications as described in the CDCA Plan. The site would remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, no loss or degradations to cultural resources from construction or operation of the Project would occur.

3.6.6.6 Alternative F: CEQA No Project

Alternative F describes the scenario that could result if the BLM were to approve the requested ROW grant under Alternatives A, B, C, or D and the County were to deny the requested groundwater well permit application. In this event, a solar energy facility and related infrastructure could be developed on the site but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. No drilling of the proposed wells would avoid the potential discovery and disturbance of unknown cultural resources, and so represents a slight improvement relative to Alternatives A, B, C, or D. The transport of water to the site in lieu of pumping groundwater otherwise would have no effect on cultural resources.

3.6.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under this Alternative, the Project would not be constructed and BLM would continue to manage the Project site consistent with the site's multiple use classifications as described in the CDCA Plan. Because the CDCA Plan would be amended to identify the site as unsuitable for solar development, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, no loss or degradations to cultural resources from construction or operation of the Project would occur.

3.6.7 Cumulative Effects

Cumulative impacts on cultural resources take into account the Project's impacts as well as those of other past, present and reasonably foreseeable future actions. When analyzing cumulative impacts on cultural resources, an assessment is made of the impacts on individual resources as well as the cultural resources within the cumulative impact analysis area.

The geographic area of analysis for cultural resources is broader than the Project site and study area, and includes the cultural resources, traditional use areas, and cultural landscapes located in eastern San Bernardino County. For purposes of this cumulative analysis, impacts on cultural resources could occur at any time throughout the life of the Project.

The number of archeological sites that have been lost as a result of the development of past projects in the Project vicinity is unknown. Regarding potential impacts of present and reasonably foreseeable future projects, the Lead Agencies note that the Project vicinity contains a significant archaeological and historical record that, in many cases, has not been well documented or recorded. Thus, there is the potential for the Project and all ongoing and reasonably foreseeable future development projects in the vicinity (including all projects summarized in Table 3.1-3 and shown on Figure 3.1-1) to inadvertently discover, unearth, expose, or disturb, and thereby damage, archaeological, historic, and Native American resources the locations of which are unknown. Any number of these resources could be eligible for listing in the National Register or California Register.

Further, as described and analyzed above, the Project would directly impact a total of four known archaeological sites and 36 known isolates, none of which is eligible for listing in the National Register or California Register, and would impact no built environment resources. Alternative B would impact three known archaeological sites and 31 isolates; Alternative C, four archaeological sites and 31 isolates; and Alternative D, two archaeological sites and 27 isolates. The cumulative projects summarized in Table 3.1-3 and shown on Figure 3.1-1 primarily include large-scale renewable energy projects that require extensive grading and development, and also include other types of projects. Among them, this analysis focuses on the potential for the impacts of the Project to combine with the impacts of the Silurian Valley Wind, Silurian Valley Solar, Stateline Solar, and Ivanpah Solar projects in Table 3.1-3, because these are the projects most likely to have impacts that could combine with those of the Project at a landscape level. Specific data or other information about the impacts of the Silurian Valley Wind Project and the Silurian Valley Solar Project to known cultural resources are not available; however, information is known about the other projects.

The November 2012 Draft EIS/EIR for the Stateline Solar Farm project identifies 19 archeological sites, all of which date to the historic period (BLM, 2012b). The April 2010 Supplemental Draft EIS for the Ivanpah Solar Electric Generating System project discloses that the project would have no direct or indirect adverse impact on known or unknown National Register-eligible or California Register-eligible resources, but does not identify the number of non-eligible archeological sites in the APE (BLM, 2010). None of the archeological sites or isolates, once damaged or destroyed by the Project or other projects in the cumulative scenario, can be replaced. Damage to or destruction of archaeological sites or isolates would result in an adverse cumulative impact.

3.6.8 Mitigation Measures

Project-specific mitigation measures have been developed to reduce, avoid, or mitigate potential cultural resources impacts associated with construction, operation, and decommissioning of the proposed Project or an alternative.

> **Mitigation Measure 3.6-1:** Prior to earth moving activities, the Applicant shall retain a qualified archaeologist, defined as one meeting the Secretary of the Interior's qualifications standards for archaeology and subject to approval by the BLM, to conduct cultural resources sensitivity training for all construction personnel. Construction personnel shall be informed of the types of cultural resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources. The Applicant shall ensure that construction personnel are made available for and attend the training and shall retain documentation demonstrating attendance.
>
> **Mitigation Measure 3.6-2:** A Cultural Resources Discovery and Monitoring Plan (CRDMP) shall be developed and implemented by an archaeologist who meets the Secretary of the Interior's Standards. The CRDMP shall detail provisions for the archaeological monitoring of Project construction. Archaeological monitoring during ground-disturbing activities shall be conducted by an archaeologist familiar with the types of historic and prehistoric resources that could be encountered within the APE, who shall have the authority to halt construction in the event of a discovery. The archaeological

monitor shall work under the direct supervision of the qualified archaeologist. All cultural resources personnel will be approved by the BLM.

The CRDMP shall detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, and assessing National Register- and California Register-eligibility in the event that unknown cultural resources are discovered during construction. The CRDMP shall require that the contractor immediately cease all work activities in the area (within 100 feet) of the discovery until it can be evaluated by a qualified archaeologist. After cessation of excavation, the contractor shall immediately contact the BLM Archaeologist. The contractor shall not resume work until authorization from the BLM is received.

If the qualified archaeologist, in consultation with BLM, determines that the discovery constitutes a historic property per Section 106 of the National Historic Preservation Act or a historical or unique archaeological resource under the California Environmental Quality Act, preservation in place shall be the preferred manner of mitigation. In the event preservation in place is demonstrated to be infeasible, a treatment plan shall be prepared by the qualified archaeologist and shall be approved by the BLM prior to implementation. BLM shall consult with appropriate Native American representatives in determining appropriate treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. Archaeological materials recovered during any investigation shall be curated at an accredited curational facility. The CRDMP shall include provisions for reporting of monitoring and any treatment of resources in a timely manner.

Mitigation Measure 3.6-3: If human remains are discovered during construction, all work shall be diverted from the area of the discovery and the BLM authorized officer shall be informed immediately. the BLM shall ensure that any Native American human remains, funerary objects, sacred objects, and/or objects of cultural patrimony discovered on BLM administered lands during implementation of the Project will be treated in accordance with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) (Pub. L. 101-601) and 43 CFR Section 10. Avoidance and protection of inadvertent discoveries that contain human remains through Project redesign shall be the preferred protection strategy.

3.6.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to cultural resources would remain. The Proposed Action would impact five archaeological sites and 52 isolated artifacts, none of which are eligible for listing in the National Register or California Register. The effects of Alternatives B, C, D, and F are identified in Sections 3.6.5.2, 3.6.5.3, 3.6.5.4, and 3.6.5.6, respectively. While implementation of Mitigation Measures 3.6-1 through 3.6-3 would reduce the effects on cultural resources, residual effects on cultural resources would exist after mitigation measures were implemented. Cultural resources damaged or destroyed by Project activities, even if subjected to mitigation, would be lost permanently from the archaeological record. This would make the cultural resources unavailable for future study to address future research needs when more advanced investigative techniques and methods of analysis might be available. Because of the permanent removal of these resources as a result of the Project, the proposed mitigation measures would not entirely avoid Project impacts, and residual impacts would remain.

3.6.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G, Section V, a project would have a significant impact on cultural resources if it would:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5, or

d) Disturb any human remains, including those interred outside of formal cemeteries.

The remaining significance criterion identified in Section V of CEQA Guidelines Appendix G, i.e., criterion c, relates to paleontological resources and is addressed in Section 3.12.10 of this PA/EIS/EIR.

3.6.10.1 Alternative A: Proposed Action

a), b) Impact Cul-1: The Project could result in a substantial adverse change in the significance of a historical or archaeological resource. (Less than Significant with Mitigation Incorporated)

As discussed in Section 3.6.5, none of these sites and isolates identified within the Project area is eligible for listing in the National Register or California Register. Therefore, there are no known historical or unique archaeological resources that would be impacted by the Proposed Action. However, Project construction could unearth, expose, or disturb subsurface archaeological, historic, or Native American resources that may not have been apparent on the surface and that may be eligible for listing in the National Register or California Register, which could result in a substantial adverse change in the significance of a historical or archaeological resource. Such a change would be a significant adverse CEQA impact. The significance of this impact would be reduced below established thresholds by the implementation of Mitigation Measures 3.6-1 and 3.6-2. With implementation of these mitigation measures, impacts relating to historical and archaeological resources would be reduced to a less-than-significant level.

d) Impact Cul-2: The inadvertent discovery of human remains could result in their disturbance. (Less than Significant with Mitigation Incorporated)

Project activities would not result in impacts to known human remains. The inadvertent discovery of human remains as a result of any Project activity however could result in their disturbance, which would be a significant impact. In the event of inadvertent discovery of human remains, the BLM will comply with the requirements of NAGPRA. To further reduce the significance of such an impact, the Applicant would construct, operate and maintain, and decommission the Project in full compliance with all applicable standards and requirements as required by Mitigation Measure 3.6-3. With implementation of this mitigation measure, impacts relating to the unanticipated discovery of human remains would be reduced to a less-than-significant level.

3.6.10.2 Alternative B

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.6.10.1). Potential impacts to cultural resources from Alternative B would be slightly reduced relative to the Project because one fewer well would be drilled; however, this incremental difference would not change the conclusion that the impacts of Alternative B to cultural resources would be less than significant with mitigation incorporated. For the reasons discussed in Section 3.6.6, the less-than-significant, Alternative B-specific impacts to cultural resources would not be cumulatively considerable for CEQA purposes when considered in combination with the impacts caused by other projects in the cumulative scenario.

3.6.10.3 Alternative C

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.6.10.1). Potential impacts to cultural resources from Alternative C would be slightly reduced relative to the Project because one fewer well would be drilled; however, this incremental difference would not change the conclusion that the impacts of Alternative C to cultural resources would be less than significant with mitigation incorporated. For the same reasons discussed in Section 3.6.6, the less-than-significant, Alternative C-specific impacts to cultural resources would not be cumulatively considerable for CEQA purposes.

3.6.10.4 Alternative D

CEQA impacts and determinations of their significance for Alternative D would be the same as described for the Proposed Action (Section 3.6.10.1). Potential impacts to cultural resources from Alternative D would be less than significant with mitigation incorporated. For the same reasons discussed in Section 3.6.6, the less-than-significant, Alternative D impacts to cultural resources would not be cumulatively considerable for CEQA purposes.

3.6.10.5 Alternative E: No Action/No Project

Because the CDCA Plan would not be amended and the Project would not be approved for the site under this alternative, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, Alternative E would cause no impact to cultural resources. Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect to cultural resources.

3.6.10.6 Alternative F: CEQA No Project

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.6.10.1). None of the proposed wells would be drilled under Alternative F, which, therefore, would avoid the potential discovery and disturbance of unknown cultural resources as a result of well drilling activities. This slight difference in the severity of the impact between Alternative F and the Proposed Action in the risk of encountering human remains would

not affect the overall significance conclusion. Potential impacts to cultural resources from Alternative F would be less than significant with mitigation incorporated. For the same reasons as were discussed in Section 3.6.6, the incremental impacts of Alternative F also would not be cumulatively considerable.

3.6.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Because the CDCA Plan would be amended and the ROW grant would not be approved, and no Project-related development and no future solar development of any kind would be allowed on the site under this alternative, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, Alternative G would cause no impact to cultural resources. Because it would cause no impact to any of the CEQA criteria identified above, Alternative G would not cause or contribute to any cumulative effect to cultural resources.

References

Bean, Lowell John, and Sylvia Brakke Vane, 2002. *The Native American Ethnography and Ethnohistory of Joshua Tree National Park: An Overview*, produced for the National Park Service.

Bean, Lowell John, and Charles Smith, 1978. Serrano. In California, edited by R. F. Heizer, pp. 570-574, Handbook of North American Indians, Vol. 8, W. C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.aa6ec747.File.pdf/CA_Desert_.pdf]

BLM, 2006. Old Spanish National Historic Trail. [http://www.oldspanishtrail.org/assets/downloads/Barstow.pdf]

BLM, 2010. Supplemental Draft EIS for the Ivanpah Solar Electric Generating System. April. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pdfs/needles_pdfs/isegs0.Par.68554.File.dat/Supplemental-DEIS-IvanpahSolar.pdf]

BLM, 2012a. BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.1039.File.dat/M6280%20NSHT%20Management_Final_091212%20(2).pdf]

BLM, 2012b. Stateline Solar Farm Project Draft Environmental Impact Statement/Environmental Impact Report. November. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.47817.File.dat/Stateline%20Solar%20Farm%20Draft%20EIS-EIR%20-%20Nov%202012_508.pdf]

Calico Solar LLC, 2011. *Plan of Development, Calico Solar Project, San Bernardino County, California*. March. http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow/calico_feis.Par.21270.File.dat/Calico%20Final%20Version%20POD%20(2011-03-28)[2].pdf]

Daub, Lindsay, and Daron Duke, 2013. *Cultural Resources Inventory of a Segment of the Blue Bell Mine Road, Soda Mountain Solar Project, San Bernardino County, California BLM Report No. 680-09-24*. July.

Duke, Daron, and Brandon Patterson, 2009. *Cultural Resources Inventory of 6,775 Acres for the Soda Mountain Solar Project, San Bernardino County, California.* BLM Report No. 680-09-24. November.

Earle, David, 2005. The Mojave River and the Central Mojave Desert: Native Settlement, Travel, and Exchange in the Eighteenth and Nineteenth Centuries. *Journal of California and Great Basin Anthropology*, 25(1), pp. 1-38.

Enzel, Yehouda, Stephen G. Wells, and Nicholas Lancaster, 2003. Late Pleistocene Lakes Along the Mojave River, Southeast California, In *Paleoenvironments and paleohydrology of the Mojave and Southern Great Basin Deserts*, edited by Yehouda Enzel, Stephen G. Wells, and Nicholas Lancaster, Geological Society of America, Special Paper 368, p. 61-77. Boulder, Colorado.

Giambastiani, Mark A., and Thomas F. Bullard, 2007. Terminal Pleistocene-Early Holocene Occupations on the Eastern Shores of China Lake, California, *Pacific Coast Archaeological Society Quarterly* 43(1/2):50-70, printed January 2010.

Greene, Linda W., 1983. *Historic Resource Study: A History of Land Use In Joshua Tree National Monument.* Performed for Branch of Cultural Resources Alaska/Pacific Northwest/Western Team, US Department of the Interior National Park Service.

Hatheway, Roger, 2006. State of California, Department of Parks and Recreation, 523 Series Forms: Edison Company Boulder Dam-San Bernardino Electrical Transmission Line. Prepared by Hatheway & Associates, August. On file at the San Bernardino Archaeological Information Center, Redlands, CA.

Kelly, I. T., and C.S. Fowler, 1986. Southern Paiute, in *Handbook of North American Indians, Volume 11: Great Basin*, edited by Warren L. D'Azevedo, pp. 368-397, Smithsonian Institution, Washington.

King, C., and D. G. Casebier, 1981. *Background to Historic and Prehistoric Resources of the East Mojave Desert Region*, Report prepared by Archaeological Research Unit, University of California, Riverside, Submitted to the US Department of the Interior, BLM, Riverside, California.

Kroeber, A. L., 1925. *Handbook of the Indians of California*, Reprint Edition of 1976, Dover Publications, New York.

Lyman, Edward, 1999. The Arrowhead Trails Highway: California's Predecessor to Interstate 15. *Southern California Quarterly*, 81(3), Fall 1999, pp. 315-340.

McCabe, Allen, 2013. *Cultural Resources Inventory of an Additional 335 Acres for the Soda Mountain Solar Project*. BLM Report No. 680-09-24. February.

Myrick, David, F., 1963. *Railroads of Nevada and Eastern California: Volume Two-The Southern Roads,* Howell-North Books, Berkeley, California.

National Park Service (NPS) 1995. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation.* National Park Service, Washington, D.C.

Parker, Patricia, and Thomas King, 1990. *Guidelines for Evaluating and Documenting Traditional Properties*, National Register Bulletin 38, US Department of the Interior, National Park Service Cultural Resources.

Price, Barry, Alan G. Gold, Barbara S. Tejada, David D. Earle, Suzanne Griset, Jay B. Lloyd, Mary Baloian, Nancy Valente, Virginia S. Popper, and Liza Anderson, 2008. *The Archaeology of CA-LAN-192: Lovejoy Springs and Western Mojave Desert Prehistory*. Prepared by Applied Earthworks for the County of Los Angeles.

San Bernardino County, 2007. *San Bernardino County 2007 General Plan, as amended.*

Shumway, Gary L, Larry M. Vredenburgh, and Russell D. Hartill, 1980. *Desert Fever: An Overview of Mining in the California Desert*.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen, 2007. Advances in understanding Mojave Desert Prehistory, in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp 229-245.

Thomas, Tiffany Ann, 2011. A landscape approach to Late Prehistoric settlement and subsistence patterns in the Mojave Sink. Master's thesis, *UNLV/Theses/Dissertations/ Professional Papers/Capstones.* Paper 1290. [http://digitalscholarship.unlv.edu/ thesesdissertations/1290]

Vredenburgh, Larry M., 2005. *An Overview of Mining in the California Desert*, electronic document http://vredenburgh.org/mining_history/pages/mining_overview2005.htm, accessed December 15, 2010.

Warren, C. N., 1984. The Desert Region, In *California Archaeology*, Coyote Press, Salinas, California.

3.7 Geology and Soil Resources

3.7.1 Introduction

This section describes the existing geology, soil conditions, and seismicity in the vicinity of the Project site in terms of local topography, geology, soil resources, and regional seismicity. This section also identifies local geologic and seismic hazards that could affect structures associated with the Project. The study area relevant to geology, soils, and geologic hazards comprises the Project site: the physical footprint of Project construction, operation, maintenance, and decommissioning activities. The study area relevant to faulting and seismic hazards comprises the broader eastern Mojave Desert region, reflecting that the Project site could be affected by ground shaking and secondary seismic hazards associated with distant faults. This section also describes laws, regulations, plans, and policies related to geologic and seismic considerations that may be relevant to the Project.

3.7.2 Regional and Local Environmental Setting

3.7.2.1 Regional Geology

The Project site is located in the southeastern portion of the Mojave Desert geomorphic province (California Geological Survey [CGS], 2002).[1] Mojave Desert geomorphology and topography are largely controlled by fault trends, and are characterized by isolated mountain ranges separated by desert plains, many draining internally and having central playas (e.g., Soda Lake). To the north and west, the boundaries of the geomorphic province are marked by major mountain ranges (e.g., the Sierra Nevada and Transverse ranges) and regional faults (e.g., the Garlock Fault and the San Andreas Fault). To the east, the geomorphic province is bounded by the Nevada and Arizona borders.

3.7.2.2 Local Setting

Topography

The Project site lies within a small, intermontane desert valley occupied by alluvial fan deposits and surrounded by the Soda Mountains. The main mass of the Soda Mountains lies to the west of the Project site and reaches an elevation of approximately 3,625 feet. Lower mountains to the south and east form a discontinuous border reaching elevations of 1,850 feet and 2,350 feet, respectively (Wilson Geosciences, 2011). The mountains farther to the north are within these same general elevation ranges. Within the Project site, elevations range from approximately 1,600 feet on the southwest to 1,550 feet on the north and to 1,250 feet on the southeast. The southwest portion of the Project site, east of I-15, has an elevation of roughly 1,520 feet. Terrain within the Project area consists of predominantly south to east sloping (at 2 to 4 percent) alluvial deposits emanating from the Soda Mountains to the west, with minor north and west sloping

[1] A geomorphic province is a naturally defined geologic region with distinct and unique landforms that have developed due to a specific combination of geologic units, faults and fault zones, and climate.

terrain at the edges of the smaller mountains on the east. Surface morphology within the Project site varies from smoothly undulating and relatively flat alluvial fan surfaces to incised young and active drainages cut into the elevated older alluvial fan surfaces (Wilson Geosciences, 2011).

Geology

Geologic units within the Project site consist primarily of alluvium (sedimentary deposits derived from weathering, erosion, and transport) on the flanks of the Soda Mountains and in the central valley and washes, though small areas of bedrock are present in the south and southwest extremes of the site. Surface geology of the Project site is shown in Figure 3.7-1. Some of the alluvium is modern (Holocene)[2] stream deposits, which emanate primarily from alluvial fan deposits originating in the mountains and sloping down to the valleys, forming fan-shaped wedges of predominantly sand, gravel, cobbles, and boulders. The percentage of sand and smaller gravel generally increases with distance from the mountains, and the percentage of cobbles and boulders generally decreases. Alluvial fans vary from recent (decades to millennia) to very old (tens of thousands of years), with the older deposits forming the more elevated surfaces (Wilson Geosciences, 2011). Bedrock formations in the surrounding mountains are predominantly granitic and volcanic, though there are older and younger sedimentary formations more distant and to the north. These bedrock formations are generally very hard and moderately to very fractured, and form the source materials that have been transported to build the alluvial fan deposits that fill the valley (Wilson Geosciences, 2011).

Soils

The Natural Resources Conservation Service (NRCS) has not mapped the Project area for soil types or major soil associations (Wilson Geosciences, 2011). However, there are no unique or prime farmland soils within the footprint of the Project site. Soil classifications for the Project site are derived from a previous field investigation (DYA, 2010) and are described using the Unified Soil Classification System (USCS). The field investigation consisted of drilling a number of shallow (and one deep) borings across the Project site, which revealed the surface to be generally covered with sandy and gravelly soils. The percentage of gravel-sized and larger particles ranged from approximately 10 to 50 percent, and the percentage of fine-grained silts or clays ranged from 5 to 20 percent (DYA, 2010).[3] Further, according to the geotechnical and geologic investigations, no groundwater or saturated soils were encountered above 180 feet below ground surface (bgs) (DYA, 2010; Terra Physics, 2010).

3.7.2.3 Geologic Hazards

Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Slope stability can depend on several complex variables,

[2] Holocene time is from the present to 11,000 years ago.
[3] The upper 20 feet of alluvial deposits were classified under the Unified Soil Classification System as GP (poorly-graded gravel), GM (silty gravel), and SM (silty sand) (Wilson Geosciences, 2011).

including the geology, structure, and the amount of groundwater present, as well as external processes such as climate, topography, slope geometry, and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. Landslides typically occur within slide-prone geologic units that contain excessive amounts of water or are located on steep slopes, or where planes of weakness are parallel to the slope angle. The predominantly flat, alluvial nature of the Project site generally precludes any risk of or susceptibility to landslides. No landslide hazards are identified for the Project area on the County geologic hazards map (San Bernardino County, 2007).

Soil Erosion

Erosion of soil or rock can be driven by the shearing action of water and wind. Water erosion can occur by rill and gully development driven by overland flow, or by lateral erosion of a stream channel. For example, active alluvial fans are typically very dynamic with respect to lateral changes in the main channels and prone to relatively high rates of vertical and lateral scour. Active alluvial fans also typically are characterized by a high sediment supply rate and subsequent deposition over the fan surface. Excessive soil erosion can eventually lead to damage of building foundations and roadways, loss of topsoil, or substantial changes in drainage patterns or water quality. At the Project site, areas that are susceptible to increased erosion potential are generally those that would be disturbed and exposed during the construction phase.

The properties of soil influencing erosion by rainfall and runoff are the infiltration capacity and the resistance to detachment and transport by falling or flowing water. Soils with high infiltration rates and permeability reduce the amount of runoff (and therefore the erosion potential), while soils containing high percentages of fine sands and silt, and that are low in density, are generally the most erodible. The majority of the alluvial formations throughout the Project site are sand and gravel-rich, and excessively drained to well-drained, which reduces erosion potential (Wilson Geosciences, 2011). Alluvial units with desert pavement (a surface of interlocking gravels) are less prone to erosion if undisturbed. Intermediate-age alluvial fans are covered with variously developed desert pavement. In general, the highly ephemeral nature of seasonal runoff leads to erosion generally being concentrated along active and (to a lesser degree) young alluvial fans and washes. The potential for the Project to result in an increase in soil erosion is further discussed in Sections 3.2, *Air Resources*, and 3.19, *Water Resources*.

Problematic Soils

Problematic soil conditions such as corrosion and expansion (linear extensibility or shrink-swell) are potential geologic hazards for components of the Project and are discussed in detail below.

Corrosion

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate

and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The risk of corrosion is expressed as “low,” “moderate,” or “high.”

Risk of corrosion also pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer. The risk of corrosion is expressed as “low,” “moderate,” or “high.”

Project site soils were tested for pH, soluble sulfate content, soluble chloride content, and electrical resistivity (DYA, 2010). In general, based on testing results, most of the Project site soils have high corrosion potential for uncoated steel and low corrosion potential for concrete.

Expansive Soils

Expansive soils possess a “shrink-swell” behavior, also referred to as linear extensibility. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Changes in soil moisture could result from a number of factors, including rainfall, irrigation, and/or variability in shallow groundwater elevations. Structural damage may occur over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. For the Project site, no expansive soils were identified by the geotechnical investigation and based on the nature of alluvial deposition no expansive soils are expected (Wilson Geosciences, 2011).

Subsidence and Settlement

Subsidence of the land surface is a general process that can be attributed to natural phenomena, such as tectonic deformation, consolidation, hydrocompaction, collapse of underground cavities, oxidation of organic-rich soils, or rapid sedimentation, and also by human activities, such as the withdrawal of groundwater. Naturally-occurring subsidence most frequently takes place in areas that are tectonically active, such as volcanic regions and fault zones. Subsidence due to groundwater withdrawal is possible due to substantial pumping; however, there are no known records of such conditions in the vicinity of the Project site (Wilson Geosciences, 2011). This is likely because sandy and gravelly soils are less susceptible to subsidence. Based on a geophysical investigation of the Project site (Terra Physics, 2010), groundwater is estimated to be 180 to 350 feet below ground surface (bgs). Therefore, even with groundwater withdrawal from the valley, it is very unlikely that subsidence would occur (Wilson Geosciences, 2011).

Regional Faulting and Seismic Hazards

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity. Faults are planar features within the earth's crust that have formed to release stresses caused by the dynamic movements of the earth's major tectonic plates. An earthquake is produced when these stresses cause the rock to rupture or cause the opposite sides of faults move relative to one another. The movement causes seismic waves to propagate through the earth's crust, producing the ground-shaking effect known as an earthquake. The movement also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Geologists commonly use the age of offset rocks to date fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault will produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence and extent of past displacement along a fault. An *active* fault is defined by the State of California as a fault that has had surface displacement within the last 11,000 years. For the purpose of delineating fault rupture zones, the California Geological Survey (CGS) historically defined a *potentially active* fault as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years). However, usage of that term was discontinued because it became apparent that there are so many Quaternary-age faults in the state that it would be meaningless to zone all of them (Bryant and Hart, 2007). In late 1975, the State Geologist made a policy decision to zone only those faults that have a relatively high potential for ground rupture. It was decided that a fault should only be considered for zoning if it is "sufficiently active"[4] and "well-defined."[5] *Blind* faults do not show surface evidence of past earthquakes, even if they occurred in the recent past; and faults that are confined to pre-Quaternary rocks are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude. When an earthquake occurs along a fault, a way to describe its size is to measure the energy released during the event. When an earthquake occurs, a network of seismographs records the amplitude and frequency of the seismic waves it generates. During the 20th century, multiple methods were developed to characterize the energy of an earthquake using seismic data. One method is the Richter Magnitude (M_L, also referred to as local magnitude), which represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole number step representing a ten-fold increase in the amplitude of the recorded seismic waves. The Moment Magnitude scale (Mw) is another, more modern method, and is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, both contain a

4 A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.

5 A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances, while Richter magnitude can be more reliable for smaller and closer earthquakes. Seismologists choose the most reliable magnitude scale for a given earthquake and assign that value as the reported magnitude, usually written as M.

Peak Ground Acceleration. A common measure of ground motion during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from stationary in 4.5 seconds. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g. hard bedrock, soft sediments or artificial fills).

The Modified Mercalli Intensity Scale. The Modified Mercalli (MM) Intensity Scale (Table 3.7-1) assigns an intensity value based on the observed effects of ground-shaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the MM intensity scale is qualitative in nature (i.e., it is based on actual observed effects rather than measured values). Similar to PGA, MM intensity values for an earthquake at any one place can vary depending on its magnitude, the distance from its epicenter, the focus its energy, and the type of geologic material. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage. Because the MM is a measure of ground-shaking effects, intensity values can be related to a range of average PGA values, also shown in Table 3.7-1.

Seismic Context

The Project site is located in a broad region of active and potentially active faults and fault zones that bound the Mojave Desert province. The closest active faults or fault zones to the Project site are (in order of increasing distance) the Red Pass Lake Fault, the Eastern California Shear Zone (ECSZ), the Garlock Fault, and the San Andreas Fault Zone (SAFZ). The Red Pass Lake Fault is located 2.2 miles west of the Project area on the southwestern flank of the Soda Mountains (Figure 3.7-2); the fault does not project toward the Project site (Wilson Geosciences, 2011). Several Quaternary-age potentially active faults (the nearest being the Baker Fault north and east of the area) near the area trend northwest-southeast, and others have a variety of trends. Although no mapped faults occur within or immediately adjacent to the Project site, it is possible that one or more faults exist beneath the sediments filling the valley based on nearby faults projecting toward the basin.

Numerous historic/instrumental earthquakes greater than magnitude 2 have been reported within 50 miles of the central portion of the Project site, and the vast majority lie to the west and southwest within the ECSZ. One event of magnitude 5.1 occurred approximately 16 miles northwest of Ludlow and 35 miles east of Barstow on December 5, 2008; shaking was felt from San Diego to Los Angeles to Las Vegas (Wilson Geosciences, 2011). The April 10, 1947, Manix

TABLE 3.7-1
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Ground Acceleration
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	0.0017 – 0.014 g
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated.	0.0017 – 0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014 – 0.039 g
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	0.035 – 0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	0.092 – 0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18 – 0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34 – 0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65 – 1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

SOURCE: ABAG, 2003

earthquake of magnitude 6.5 occurred on the Manix Fault, approximately 25 miles east of Barstow, and had a surface rupture length of about 3 miles with a maximum slip was about 2 inches. On June 28, 1992, the magnitude 7.3 Landers earthquake produced a 53-mile-long surface rupture with an average slip of 10 to 13 feet and a maximum slip of about 20 feet (Wilson Geosciences, 2011). One instrumentally recorded earthquake of magnitude 2 to 3 is shown near the trace of the Red Pass Lake Fault (the nearest active fault to the Project site), and the 1947 Manix earthquake is within 25 miles of the area (Wilson Geosciences, 2011). Prior analysis suggests that the 1947 Manix

earthquake may have occurred on a conjugate fault with a similar orientation as the Red Pass Lake Fault, suggesting the Red Pass Lake Fault may be capable of a similar sized earthquake (Wilson Geosciences, 2011). Earthquake activity on distant larger-scale active fault zones (e.g., the SAFZ, Garlock, ECSZ, Helendale, Southern Death Valley, and Stateline) could produce large magnitude earthquakes that would be felt in the vicinity of the Project site.

Surface Fault Rupture

Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. A factor considered in the seismic design of Project structures is the location of active faults that may cross a portion of the facility; ground movement and surface rupture offset can be several feet vertically and horizontally, which could cause damage that would severely disrupt operations (Wilson Geosciences, 2011). Based on the available data, no active or potentially active surface faults cross the Project area (Wilson Geosciences, 2011). A short Quaternary fault, west of and parallel to the main Baker fault, projects toward the far eastern edge of the Project site, and although it has not been mapped in this area, it is possible that one or more faults exist beneath the sediments filling the valley. However, there is no indication from the latest fault activity maps that this fault segment poses a surface rupture risk (Wilson Geosciences, 2011).

Seismic Ground Shaking

The U.S. Geological Survey (USGS) (2010) provides a uniform estimate of earthquake-induced ground motion intensity for the United States based on an up-to-date assessment of potential earthquake faults or other sources. One of the benchmarks used by the USGS is the PGA that has a 2 percent probability of being exceeded in 50 years. This probability level would allow structures to be designed for ground motions that have a 98 percent chance of *not* occurring in the next 50 years, making buildings safer than if they were simply designed for the most likely events. The approximate range of PGA with a 2 percent probability of occurrence during a 50-year period is 0.30g to 0.40g for the central and southern portions of the Project site (including the proposed location of the operation and maintenance area buildings), and 0.20g to 0.40g for the northern edge of the Project site. The maximum expected earthquake for the Red Pass Lake Fault could produce higher peak ground acceleration levels for the entire Project site and surrounding area, possibly near 0.50g, due to its proximity and to the possibility it is a thrust fault that dips beneath the area (Wilson Geosciences, 2011). Overall, this information suggests that strong ground shaking would be within the highest levels experienced in the Landers earthquake area in 1992 (0.45g) and the Hector Mine earthquake in 1999 (0.42g), both in the Mojave Desert region south-southwest of the Project area (Wilson Geosciences, 2011).

Liquefaction

Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction, which can include loss of bearing strength, lateral spreading, subsidence, and buoyancy effects caused when these sediments temporarily lose their shear strength during strong ground shaking. Susceptibility to liquefaction is a function of the sediment

density, water content, depth, and the peak ground acceleration. The potential for liquefaction within the Project site is very low for the following reasons (Wilson Geosciences, 2011):

1. Permanent groundwater depth is much greater than 50 feet (probably 180 to 350 feet deep);
2. Geologic material types are dense and contain a high percentage of gravel, cobbles, and boulders (intermediate and older alluvial fans); and
3. Some geologic units have calcium carbonate cementation (some intermediate-age alluvial fans).

It is plausible that seasonal "perched" groundwater may exist at depths less than 50 feet, however the grain size and density of the alluvium should still preclude liquefaction (Wilson Geosciences, 2011). In addition, the San Bernardino County General Plan Safety Element (San Bernardino County, 2007) shows no liquefaction areas near the Project area.

3.7.3 Applicable Laws, Regulations, Plans, and Standards

3.7.3.1 Federal

International Building Code

The 2006 International Building Code (IBC) is a model building code developed by the International Code Council (ICC) that sets rules specifying the minimum acceptable level of safety for constructed objects such as buildings in the United States. As a model building code, the IBC has no legal status until it is adopted or adapted by government regulation. California has adopted the IBC. The IBC was developed to consolidate existing building codes into one uniform code that provides minimum standards to ensure the public safety, health and welfare insofar as they are affected by building construction and to secure safety to life and property from all hazards incident to the occupancy of buildings, structures and premises. With some exceptions, the California Building Code discussed below is based on the ICB.

Federal Land Policy and Management Act of 1976 (as amended)

The Federal Land Policy and Management Act (FLPMA) establishes policy and goals to be followed in the administration of public lands by the BLM. The intent of FLPMA is to protect and administer public lands within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality. Particular emphasis is placed on the protection of the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources and archaeological values. FLPMA is also charged with the protection of life and ensuring safety from natural hazards.

California Desert Conservation Area Plan of 1980 (as amended)

The CDCA Plan defines multiple-use classes for BLM-managed lands within the CDCA, which includes land area encompassing the Project site. As part of the Proposed Action, if BLM approves the requested ROW grant, it will be necessary for the BLM to amend the CDCA to identify the ROW area as appropriate for the proposed solar energy development use. With

respect to geological resources, the CDCA Plan aims to maintain the availability of mineral resources on public lands for exploration and development.

3.7.3.2 State

California Building Code

The California Building Code (CBC), which is codified in Title 24 CCR Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction.

The 2010 CBC is based on the 2009 International Building Code. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site, and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this Act, the state geologist established regulatory zones, called earthquake fault zones, around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture. This Act does not apply to the Project because no active faults cross the Project site.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate “zones of required investigation” (i.e., seismic hazard zones) where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide ground

displacements. The act requires cities, counties, and other local permitting agencies to regulate certain development projects by implementing the provisions of the act through various local building codes, permits, and ordinances. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design, consistent with CGS Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008).

As of 2012, Seismic Hazard Zone Maps have been prepared for portions of Southern California and the San Francisco Bay Area; however, no seismic hazard zones have yet been delineated for the Project site. As a result, the provisions of the Seismic Hazards Mapping Act would not apply to the Project.

California Occupational Safety and Health Administration Regulations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the work place. In California, the California Division of Occupational Safety and Health (Cal OSHA) and the federal Occupational Safety and Health Administration (OSHA) are the agencies responsible for ensuring worker safety in the workplace.

Excavation and trenching are among the most hazardous construction activities. The OSHA Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal OSHA would be the implementing agency for state and federal OSHA standards.

3.7.3.3 Local

San Bernardino County General Plan

The following policies identified in the Safety element of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

> ***Policy S 7.1.*** Strive to mitigate the risks from geologic hazards through a combination of engineering, construction, land use, and development standards.
>
> ***Policy S 7.3.*** Coordinate with local, regional, state, federal, and other private agencies to provide adequate protection against seismic hazards to County residents.
>
> ***Policy S 7.5.*** Minimize damage caused by liquefaction, which can cause devastating structural damage and a high potential for saturation exists when the groundwater level is within the upper 50 feet of alluvial material.
>
> ***Policy S 7.6.*** Protect life and property from risks resulting from landslide, especially in San Bernardino and San Gabriel Mountains that have high landslide potential.

3.7.4 Analytical Methodology

The Proposed Action and alternatives are evaluated in terms of their effects on soil resources and their susceptibility to geologic and seismic hazards. Potential effects with respect to geology and soils are assessed based upon existing publications and maps completed by state and federal agencies, such as the USGS and CGS, as well as upon Project-specific technical documents. The following Project-specific documents were reviewed:

Diaz Yourman & Associates (DYA), 2010. Preliminary Geotechnical Investigation (Phase 1A) Report Caithness Soda Mountain Solar Facility Project Baker, San Bernardino County, California.

Terra Physics, 2010. Geophysical Characterization of Subsurface Physical Properties, Caithness LLC—Soda Mountain Solar Facility, Southwest of Baker, San Bernardino County, California.

Wilson Geosciences, Inc., 2011. Geologic Characterization Report for the Proposed Caithness Soda Mountain Solar Facility near Baker, San Bernardino, California.

RMT, Inc., 2011a. Geologic Field Reconnaissance Report: Percolation, Stormwater Runoff, and Channel Scour Potential.

The potential for damage to proposed structures or increased risk of injury due to geologic hazards is analyzed using available data from the aforementioned sources. In addition, the severity and significance of geology and soils impacts are analyzed in the context of existing regulations and policies aimed at abating potential impacts to soil resources and from geologic and seismic hazards.

The Applicant has conducted preliminary geotechnical, geophysical, and engineering geology investigations for the Project. Further, the Applicant has committed to preparing design-level geotechnical and engineering geology studies to define the geotechnical characteristics of the proposed locations for Project components, which will be necessary to inform the Project's final engineering designs and construction methods. While the scope, findings, and recommendations of the report are forthcoming, this analysis assumes that the studies will be consistent with the current state of practice in the field of engineering geology, and will provide the information necessary to design the Project in accordance with the CBC. This includes soil characterization, calculation of wind and seismic loads, and site preparation and engineered fill requirements necessary for the proper design and installation of all Project components. This analysis is aimed at identifying potential geologic hazards that may not be adequately addressed through implementation of standard building practices as required by the CBC.

The following issues were considered in the analysis of impacts related to geology and soils for the Proposed Action and each alternative:

1. Accelerated and/or environmentally harmful soil erosion;
2. Damage to Project elements or increased exposure of the public to risks from rupture of a known earthquake fault;

3. Injury, death, or property damage as a result of seismically induced ground shaking or deformations (e.g. lateral spreading, subsidence, liquefaction, or collapse), or otherwise unstable soils; and

4. Injury, death, or property damage as a result of an on-site or off-site landslide.

3.7.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects to geology and soil resources:

APM 11: Facilities will be built in accordance with San Bernardino County and California State Building Code requirements applicable to "Seismic Zone 3." No human-occupied structures will be placed across the trace of a documented active fault. No human-occupied structure will be placed within 50 feet of the trace of an active fault or within a seismic special studies zone without a fault evaluation report, satisfactory to the State Geologist, demonstrating that no undue hazard would be created by the construction or placement of the structure.

APM 12: Roads shall be constructed at grade to maintain existing drainage patterns during storm events. Unpaved access roads shall be constructed of compacted native soils. Rock or gravel may be added to unpaved roads for stabilization to prevent rutting or erosion.

APM 13: Disturbed areas where clearing, grubbing, and cut-and-fill are required shall be compacted once construction is complete for greater resistance to wind erosion.

3.7.6 Direct and Indirect Effects

3.7.6.1 Alternative A: Proposed Action

As described previously, the Applicant has conducted preliminary geotechnical, geophysical, and engineering geology investigations and committed to preparing design-level geotechnical and engineering geology studies, which will be necessary to inform the Project's final engineering designs and construction methods.

Surface Faulting and Seismic Hazards

Construction, Operation, and Decommissioning

Ground Shaking. As discussed above, the potential exists for large magnitude earthquakes to result in seismically induced ground shaking within the Project site and surrounding area. Impacts related to both non-seismically induced and seismically-induced ground failures (e.g., landslides and liquefaction) are discussed further below. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, the duration of shaking, and the nature of the geologic materials in or on which the Project components would be constructed. Intense ground shaking and high ground accelerations could affect the proposed facilities (e.g., solar panel arrays and support structures, substation and switchyard facilities,

operation and maintenance facilities, and water supply lines). The primary and secondary effects of ground shaking could damage structural foundations and cause failure of concrete. During construction, damage to these features could cause temporary short-term delays in construction. During operations, damage to these features could cause temporary service disruption.

Modern standard engineering and construction practices include design criteria to mitigate potential damage from an earthquake. Based on preliminary geologic and geotechnical investigations, the Applicant has incorporated recommended design measures and criteria to minimize risks associated with geologic and seismic hazards. These investigations and subsequent design measures relate to earthwork, foundation design, resistance to lateral loads, utility trenches, pavement thickness, and soil corrosion potential, and further design-level geotechnical analysis and review will occur as part of final Project design. In addition, the administration building and other occupied parts of the facility site would be designed to withstand strong ground motion (Wilson Geosciences, 2011).

Compliance with applicable building codes and implementation of APM 11 would ensure that soil and ground instabilities would not have substantial adverse impacts on facilities and/or Project workers. This would include the effects of seismic ground shaking. Building codes include requirements to design structures according to their SDC, which provides specific building standards based on the level and intensity of expected ground motions, and the occupancy category of the structure. Because building codes and geotechnical seismic design parameters are primarily intended to avoid building collapse or substantial structural damage, a strong earthquake could still cause short term damage to or toppling of unsecured equipment, which could result in injuries to workers. However, potential worker injuries would be anticipated to be minor, and facility damage would not be expected to be severe and could be later inspected, repaired or corrected. As designed (including implementation of APM 11 and other recommended design criteria, i.e., incorporation of preliminary design recommendations (DYA, 2010)), and with compliance with applicable construction and design requirements in the CBC and County codes, the effects of seismic ground shaking on facilities and its workers would be minor.

Fault Rupture. There are no Alquist-Priolo Earthquake Faults, or other substantial known faults, that pass through the Project site. Operational activities involve periodic maintenance and inspections, and the likelihood of a newly discovered fault rupturing at a facility site while people are present is low. In addition, solar panels, transmission structures and other facilities would not be placed on or near a known active or potentially active fault zone. Therefore, it is unlikely that the Project would expose people or structures to adverse fault rupture effects.

Liquefaction. Liquefaction is a loss of strength in soil when a stress, such as that caused by an earthquake, is applied to susceptible soils, such as loose saturated sands and silts. These susceptible soils were not encountered during the preliminary geotechnical analysis, as groundwater within the Project site is generally deeper than 150 bgs. Further, no designated or identified liquefaction, lateral spreading, or other ground failure zones have been identified across, or near, the Project site (Wilson Geosciences, 2011). Due to the lack of shallow

groundwater and liquefaction-prone sediments, seismic-related ground failures are not expected in the Project site. Therefore, the Project would not expose people or structures to adverse seismic-related ground failure effects, including liquefaction and lateral spreading.

Soil Resources and Erosion

The occurrence of severe erosion is a function of the strength and competence of the earth materials, and the presence of water, wind, and/or slope (gravity) that can dislodge and transport these materials. Most alluvial earth materials within the Project site are moved by water in and near the desert washes, resulting in well-defined drainages with steep side slopes (Wilson Geosciences, 2011). The issue of water (fluvial) erosion, particularly as it concerns local drainages and washes and Project operation, is discussed in further detail in Section 3.19, *Water Resources*.

Construction

Construction activities that could affect soil resources include excavation, grading, and soil compaction to prepare the site for installation of Project components such as the solar panels and support structures, operation and maintenance facilities, new roads, and surface runoff controls (see Section 3.19, *Water Resources*). Ground-disturbing activities would have the potential to result in erosion, transport, and deposition of soil and/or surface sediments, particularly where desert pavement is present. Disturbance of this protective layer of pebble- to cobble-size material could increase wind erosion rates by exposing the underlying layer of finer-grained material. Without protective measures, disturbance of desert pavement could cause a noticeable and possibly substantial increase in wind erosion rates during construction.

Concerning fluvial erosion (i.e., water), this is only likely during storm events, while wind erosion would not necessarily be dependent upon seasonality or storm occurrence. Further, soil compaction and vegetation clearing may increase soil erosion through decreased infiltration rates and dislodging soil particles, and can result in the loss of soil pore spaces and oxygen necessary to support native plant growth. The level of surface soil disturbances that would be required for the construction phase is summarized in Table 2-1 in Chapter 2, *Proposed Action and Alternatives*. Construction activities also would result in soil compaction within linear corridors associated with new and realigned roads.

Without measures to avoid or minimize damage to soil function (e.g., due to soil compaction and rilling) during construction and operation of the Project, and without plans to properly decommission disturbed areas (i.e., restoration and revegetation), soils within the Project site could experience long term adverse impacts in specific areas through degradation of soil function and increased susceptibility to erosion. The sandy and gravelly soils throughout the Project site are generally highly permeable and thus have a low susceptibility to erosion, particularly for the coarser soil types. However, certain areas where the soils contain a relatively high proportion of fine sands and silts could be particularly vulnerable to either fluvial or aeolian erosion.

The Proposed Action includes several measures to address the potential impacts on soils, including APMs 4 and 13. These types of measures are appropriate to avoid or substantially

reduce the Project's adverse impacts on soil resources. Further, as discussed above and in Section 3.19, *Water Resources*, the requirements imposed by the LRWQCB (e.g., Stormwater Pollution Prevention Plan (SWPPP) or Best Management Practice (BMP) Plan and the mitigation measures identified in that discussion would also prevent or substantially reduce soil erosion by wind or water during both construction and operations. To ensure that APMs are reviewed and approved by BLM personnel and that proper BLM standards and guidance is used when developing erosion control and drainage plans, the Applicant shall implement **Mitigation Measure 3.7-1** (See Section 3.7.8 below). Additionally, to ensure that disturbance of desert pavement is minimized, implementation of **Mitigation Measure 3.7-4** would be required. Implementation of the APMs, the SWPPP or BMP Plan provisions, and Mitigation Measures 3.7-1 and 3.7-4 would ensure that adverse impacts to soil resources are avoided or substantially reduced.

Operation and Maintenance

Following facility construction and installation, operation and maintenance activities would have minimal additional soil impacts. Maintenance activities would include inspecting, repairing, and maintaining the arrays and tracking systems and the SCADA system; washing panels; and troubleshooting the collector lines and repairing damaged cables, which may necessitate some trenching. Additional maintenance would be required to maintain the administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site. All of these activities would take place within previously disturbed areas and would not require additional disturbances outside of the construction footprint analyzed for the construction phase (above). Without mitigation, operation and maintenance of the Project would have localized adverse impacts on soil resources. However, implementation of the APMs (listed above), and Mitigation Measure 3.7-1 would ensure that adverse impacts to soil resources are avoided or substantially reduced.

Decommissioning and Reclamation

As part of the decommissioning phase, the Applicant would prepare and implement a site restoration plan addressing removal of structures, including solar PV blocks, and roads in conformance with BLM requirements. As part of this plan, the surface of the site would be restored to conform to approximate pre-Project land uses and the vegetation would be allowed to restore itself to its natural condition without intervention. The site restoration plan also would address stabilization and revegetation of disturbed areas in conformance with BLM requirements.

Decommissioning of the Project would have short term, localized adverse impacts on soil resources while facilities are decommissioned, prior to site restoration. These impacts would be similar to though less intense than construction-related impacts discussed above. During this time, short term measures similar to those described above would be implemented to reduce or avoid adverse impacts on soils. In the long run, areas newly disturbed by the Project would be returned to pre-construction conditions through minor grading and revegetation. Thus, during Project site decommissioning and reclamation, adverse impacts to soil resources would be avoided or substantially reduced.

Soil and Ground Instabilities

Construction, Operation and Decommissioning

Typical geotechnical concerns for any type of project include the potential for long-term soil and ground instabilities associated with subsidence, settlement (especially differential settlement), expansive soils and/or landslides. These issues have been assessed and summarized preliminarily as part of the Phase 1 geotechnical investigation (Wilson Geosciences, 2011; DYA, 2010; Terra Physics, 2010; and RMT, Inc., 2011), and would be addressed further as part of the final geotechnical investigations and monitoring. If the Proposed Action is approved, the Phase 2 detailed geotechnical investigation would be based on the final design plans and specifications, and Phase 3 would be construction monitoring and geotechnical compliance documentation (Wilson Geosciences, 2011). Phase 2 would conform to the standard procedures (e.g., geotechnical drilling) for acquiring geotechnical design data to support the use of appropriate foundations (e.g., spread footings, drilled or driven piles) and to define the infiltration characteristics of proposed swale areas as necessary. Phase 3 would entail standard construction monitoring to assure foundation excavations, grading, and surface drainage areas are constructed in accordance with approved plans and specifications. The site-specific reports have provided, and would refine or expand upon in subsequent phases prior to Project construction, a characterization of soil properties and recommendations for construction site preparation, fill compaction, foundation designs, and other engineering features.

Based on initial examination of available geologic and soil information, the Project site is unlikely to be underlain or otherwise affected by unstable soil conditions. However, adverse soil conditions, if present, would be a threat to Project facilities only, and not to the public at large.

Landslides and Slope Stability. The predominantly flat, alluvial nature of the Project site generally precludes any risk of or susceptibility to landslides. No landslide hazards are identified for the Project site on the County geologic hazards map (San Bernardino County, 2007). Slope stability issues would be most important in the volcanic bedrock sections of the proposed operation and maintenance buildings area and the southernmost proposed solar panel area, where topography is steeper (Wilson Geosciences, 2011). Further, the proposed re-alignment of Rasor Road would pass through this volcanic bedrock area in the southern extent of the Project site. This southernmost area represents a relatively small portion of the overall Project area. Nonetheless, with respect to slope stability, sampling and testing of materials, and performance of slope stability analyses, would be required to ensure proper foundation design and incorporation (as necessary) of protective measures for the buildings in the operation and maintenance area, some of which would be occasionally occupied. Further, the sampling, material testing, and slope stability analysis may be required for the re-aligned portion of Rasor Road (e.g., if cut-slopes would be installed).

Subsidence and Settlement. Subsidence has been reported in some southwestern desert valleys due to groundwater withdrawal, but has not been reported within the Project site or surrounding area (Wilson Geosciences, 2011). Groundwater is relatively deep in the vicinity of the Project site (i.e., generally below 150 feet bgs), and the amount of water proposed for withdrawal for Project requirements is expected to be small: about 2 percent of total recharge in the area from

precipitation (RMT, Inc., 2011b). Ground subsidence can occur as a result of water level decline in aquifer systems. When the fluid pressure in an aquifer is reduced as a result of changes in the groundwater level, a shift in the balance of support for the overlying materials causes the "skeleton" of the aquifer system to deform slightly. Reversible deformation occurs in all aquifer systems as a result of the cyclical rise and fall of groundwater levels associated with short and longer term climatic cycles. Permanent ground subsidence can occur when pore water pressures in the aquifer fall below their lowest historical point, and the particles in the aquifer skeleton are permanently rearranged and compressed. Soils particularly susceptible to such consolidation and subsidence include compressible clays in a confined aquifer system. Compressible clays are not anticipated on site in a thickness sufficient to result in subsidence as a result of groundwater drawdown under the Proposed Action. This type of deformation is most prevalent when confined alluvial aquifer systems having thick compressible clay layers are overdrafted. Groundwater withdrawal is not expected to cause subsidence due to the small quantities to be withdrawn and because the aquifer is composed predominantly of coarse granular materials (sands and gravels) that are not susceptible to inelastic compaction.

Soil collapse describes a condition where shallow alluvial or soil deposits are compressed or compacted due to the added weight of an overlying structure or due to the addition of water. The potential effects are similar to subsidence, with possible surface cracking and tilting or damage to overlying structures. The potential for soil collapse within the Project site, particularly within the proposed solar arrays, is uncertain. As part of the additional geotechnical investigations, further evaluation of the soils and geologic formations underlying the solar array locations would be required, including additional sampling and testing of materials and performance of calculations to allow for site-specific foundation designs that would account for potentially collapsible soils (as necessary).

Expansive Soils and Corrosion. Soils on the Project site and surrounding area are relatively coarse-grained and lack a significant clay fraction or thick accumulations of organic material. No expansive soils were identified by the geotechnical investigation and, based on the nature of alluvial deposition, no expansive soils are expected (Wilson Geosciences, 2011; DYA, 2010). As a result, the Project would not create substantial risks to life or property associated with expansive soils.

Project site soils were tested for pH, soluble sulfate content, soluble chloride content, and electrical resistivity (DYA, 2010). In general, based on testing results, most of the Project site soils have high corrosion potential for uncoated steel and low corrosion potential for concrete. The Applicant does not propose to use uncoated steel in any subsurface structure, and would use corrosion resistant support structures within the proposed solar arrays. Based on Caltrans standards and other published correlations and the chemical test results, the tested soils were classified as non-corrosive (DYA, 2010). However, the corrosion testing was limited to six samples, and additional corrosion testing should be performed in the second phase of this investigation when additional areas of the site become accessible (DYA, 2010).

Generally, the topics discussed above (i.e., landslides and slope stability, subsidence and settlement, and expansive soils and corrosion) are typical geotechnical issues that routinely are addressed through the application of modern building codes, compliance with permit provisions, and industry standard building practices such as removal or treatment of unsuitable soils, proper placement and compaction of imported fills, and appropriate foundation and/or retaining wall designs. However, to provide further assurance that geotechnical issues would be appropriately evaluated and addressed, and to ensure Project components are appropriately designed, in addition to APM 11 and proposed design-level geotechnical and engineering geology studies (see Section 3.7.4), implementation of **Mitigation Measure 3.7-2** would be required. Mitigation Measure 3.7-2 provides more specificity to the scope of the proposed Phase 2 investigation, and directs the Applicant to retain a geotechnical engineer to be on-site during site preparation and grading to ensure geotechnical recommendations are being properly implemented. Compliance with applicable building codes and implementation of APM 11 and Mitigation Measure 3.7-2 would ensure that soil and ground instabilities would not have adverse impacts on facilities and Project workers.

Septic Tanks and Leach Fields

Soils suitable for septic and wastewater disposal systems are generally well-drained so that water can percolate through the soils efficiently. Most of the soils within the Project site and surrounding area are classified as well-drained to excessively well-drained (Wilson Geosciences, 2011). At the proposed operation and maintenance buildings site, the only area that would have permanent toilet facilities, moderately fractured volcanic bedrock is present, which would likely have poor drainage characteristics. Therefore, soils at this site may be incapable of adequately supporting the use of septic tanks or any alternative wastewater disposal system. To ensure soils at the operation and maintenance buildings site are adequate for septic tank installation and operation, the Applicant would need to conduct proper geotechnical and engineering geology studies to investigate and evaluate the soil and geologic formations and assess soil permeability and percolation characteristics. Thus, implementation of **Mitigation Measure 3.7-3** would ensure that adverse impacts related to the capacity of soils to support septic tanks would be avoided or substantially reduced.

It is anticipated that in remote areas, workers would use portable toilets and waste liquids would be removed by qualified waste disposal contractors and disposed of in accordance with all applicable regulations and codes.

3.7.6.2 Alternative B

Alternative B is described in Section 2.5.1. Under this Alternative, the East and South arrays would be constructed as described for the Proposed Action, but the North Array would not be constructed. Alternative B also includes an alternative southern alignment for Rasor Road, whereby the road would bend around to the south in a longer alignment that more closely follows the contour of the existing land surface. All other project components would be similar to those described for the Proposed Action.

Surface Faulting and Seismic Hazards

The changes proposed under Alternative B would not result in a greater or lesser number of active fault crossings, or change the level of seismic hazard expected at the Project site. Therefore, the impacts of Alternative B on surface faulting and seismic hazards would be similar to those discussed for the Proposed Action in Section 3.7.6.1.

Soil Resources and Erosion

The footprint of Alternative B would include essentially the same geologic and soil units as were described and analyzed in the context of the Proposed Action, although the area of disturbance under Alternative B would be reduced as shown in Table 2-6. The type and level of impacts on soil resources under Alternative B would be similar but slightly reduced compared to impacts of the Proposed Action (see Section 3.7.6.1).

Soil and Ground Instabilities

The proposed re-alignment of Rasor Road under Alternative B avoids the volcanic bedrock area and aligns the road with the existing surface contours, which could result in less excavation and/or cut-slopes for road installation. The type and level of impacts on soil and ground instabilities under Alternative B would be similar but slightly reduced compared to those discussed for the Proposed Action in Section 3.7.6.1.

Septic Tanks and Leach Fields

Under Alternative B, construction and operation of the operation and maintenance buildings would be similar to the Proposed Action. Therefore, the impacts of Alternative B on septic tank and leach field feasibility would be similar to those discussed for the Proposed Action in Section 3.7.6.1.

3.7.6.3 Alternative C

Alternative C is described in Section 2.5.2. Under this Alternative, the North and South arrays would be constructed as described for the Proposed Action, but the East Arrays would not be constructed. All other Project components would be similar to those described for the Proposed Action.

Surface Faulting and Seismic Hazards

The changes proposed under Alternative C would not result in a greater or lesser number of active fault crossings, nor would they change the level of seismic hazard expected at the site. Therefore, the impacts of Alternative C related to surface faulting and seismic hazards would be similar to those discussed for the Proposed Action in Section 3.7.6.1.

Soil Resources and Erosion

The footprint of Alternative C would include essentially the same geologic and soil units as the Proposed Action. However, the area of disturbance under Alternative C is reduced as shown in

Table 2-7. The type and level of impacts on soil resources under Alternative B would be similar but slightly reduced compared to those discussed for the Proposed Action in Section 3.7.6.1.

Soil and Ground Instabilities

The changes under Alternative C in relation to soil and ground instabilities relative to the Proposed Action would be inconsequential. Therefore, the impacts of Alternative C on soil and ground instabilities would be similar to those discussed for the Proposed Action in Section 3.7.6.1.

Septic Tanks and Leach Fields

Under Alternative C, construction and operation of the operation and maintenance buildings would be similar to the Proposed Action. Therefore, the impacts of Alternative B on septic tank and leach field feasibility would be the same as those discussed for the Proposed Action in Section 3.7.6.1.

3.7.6.4 Alternative D

Alternative D is described in Section 2.5.3. Under this Alternative, the North Array would be constructed as described for the Proposed Action, and the East and South arrays would be reduced in size. The operation and maintenance buildings and brine ponds would be located further to the north than for the Proposed Action, and the existing Rasor Road would be used for site access (i.e., no re-alignment would occur). All other Project components would be similar to those described for the Proposed Action.

Surface Faulting and Seismic Hazards

The changes proposed under Alternative D would not result in a greater or lesser number of active fault crossings, nor would they change the level of seismic hazard expected at the site. Therefore, the impacts of Alternative D on surface faulting and seismic hazards would be similar to those discussed for the Proposed Action in Section 3.7.6.1.

Soil Resources and Erosion

The footprint of Alternative D would include essentially the same geologic and soil units as the Proposed Action. However, the ultimate area of disturbance under Alternative D would be reduced as shown in Table 2-8. The type and level of impacts on soil resources under Alternative D would be similar but slightly reduced compared to impacts of the Proposed Action as discussed in Section 3.7.6.1.

Soil and Ground Instabilities

The proposed use of Rasor Road in its existing condition under Alternative D would avoid road construction within the volcanic bedrock area. Thus, Alternative D would avoid the erosional volcanic bedrock area and possibly require less excavation and/or cut-slopes than the Proposed Action. The type and level of impacts on soil and ground instabilities under Alternative D would

be the similar but slightly reduced compared to impacts of the Proposed Action as discussed in Section 3.7.6.1.

Septic Tanks and Leach Field

Under Alternative D, the operation and maintenance buildings would be located further north, overlying alluvium. Based on the soil characteristics of the Project site, the alluvial soils would likely present better drainage conditions for supporting installation of a septic tank or an alternative wastewater treatment system. Further, for this alternative buildings location (i.e., further to the north), the California Plumbing Code (Title 24 Cal. Code Regs. Part 5) requirements indicate that an on-site wastewater treatment system is feasible for the disposal of wastewater generated from the operation and maintenance building (RMT, Inc., 2011b). According to the geotechnical investigation (DYA, 2010), no groundwater, bedrock, or impervious soil exists within 12 feet of the ground surface within the alluvium geologic units, the Project site is not located within a flood zone, and is large enough to serve the proposed on-site structures with applicable setbacks

The type and level of impacts on septic tank and leach field feasibility under Alternative D would be the similar to but slightly reduced compared to impacts of the Proposed Action as discussed in Section 3.7.6.1.

3.7.6.5 Alternative E: No Action/No Project

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed and no realignment and no upgrade of Rasor Road would occur. Therefore, no subsequent impacts to geologic or soil resources would occur. The Project site would continue to experience existing levels of geologic and seismic hazards. Soil resources within undisturbed areas associated with Project facilities would not be adversely affected and areas that are currently devoid of vegetation or compacted for access roads would continue to exist in that condition. Alternative E would have no effect on geologic or soil resources.

3.7.6.6 Alternative F: CEQA No Project

Under Alternative F, BLM would approve the requested ROW grant, and the County would deny the requested groundwater well permit application. In this event, a PV solar energy facility and related infrastructure could be developed on the site but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. The principal change under this alternative would be the need to acquire and deliver water to the Project site to satisfy all necessary demands. With respect to the location and footprint of the Proposed Action or Alternative B, C, or D, and the subsequent potential effects on geologic and soil resources, the changes introduced by Alternative F would be inconsequential. Thus, the impact of Alternative F

on geologic and soil resources would be the same as those described above for the Proposed Action or Alternative B, C, or D, whichever would be the case.

3.7.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project but would amend the CDCA Plan to identify the site as unavailable for solar development, and the County would not approve the groundwater well permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed and no realignment and no upgrade of Rasor Road would occur. Therefore, no subsequent impacts to geologic or soil resources would occur. The Project site would continue to experience existing levels of geologic and seismic hazards. Soil resources within undisturbed areas associated with Project facilities would not be adversely affected and areas that are currently devoid of vegetation or compacted for access roads would continue to exist in that condition. Alternative G would have no effect on geologic or soil resources.

3.7.7 Cumulative Effects

Loss of soil through erosion, land subsidence due to groundwater withdrawals, and soil instability caused by construction and operation of a project are impacts that can cumulatively affect soil and geologic resources in combination with other past, present, and reasonably foreseeable future actions in a given area. These potential cumulative impacts would apply to the construction, operation, maintenance, and decommissioning phases of the Proposed Action or any of the action alternatives. All other geology and soils issues (such as strong seismic ground shaking, seismically induced ground failure, collapsible soils, and expansive soils) relate to local, site-specific soil conditions, ground response to earthquakes, and the potential for adverse soil conditions to damage the Project's structural components. The presence of other projects in the cumulative scenario would have no effect on either the severity or the probability of geotechnical challenges associated with seismicity and/or the character of underlying soils. Such issues are site-specific and unaffected by the presence of other projects in the cumulative scenario. Therefore, only potential soil erosion and land subsidence issues are analyzed in this discussion.

Projects located in the same watershed(s) as the Proposed Action or Alternatives B, C, or D could contribute to cumulative soil erosion or land subsidence impacts. The greatest potential for cumulative impacts with respect to soil erosion would occur if either the construction or decommissioning phases of the cumulative projects were to happen concurrently with the Project. However, the operation and maintenance phase of the cumulative projects also are included in the temporal scope of this analysis because minor alterations in topography and the addition of impervious surfaces could combine to cause or contribute to cumulative impacts. For land subsidence, applicable potential cumulative projects include all projects that would draw groundwater from the same aquifer. The temporal scope of impacts would include all phases of the projects, because some level of groundwater typically is needed for construction and

decommissioning activities (e.g., dust suppression), and operation and maintenance needs (e.g., panel washing and water service for operation and maintenance buildings).

Cumulative projects are identified in Table 3.1-3 and shown in Figure 3.1-1. Adjacent projects that could contribute to local erosion-related impacts if constructed include the XpressWest High Speed Passenger Rail Project and the Calnev Pipeline Expansion Project, since these are the only projects in the cumulative scenario that would be constructed in the same watersheds as the Proposed Action or action alternatives.

Land subsidence could occur either at the Project site or a neighboring project site if the combined amount of groundwater use associated with these projects results in a lowering of the groundwater levels sufficient to result in ground subsidence. As discussed in Section 3.19, *Water Resources*, a groundwater model was completed to support the analysis of groundwater supply and drawdown. Water basins that could be affected by the Proposed Action or an action alternative were identified in this report. The only cumulative projects that cross these basins are the XpressWest High Speed Passenger Rail Project and the Calnev Pipeline Expansion Project, both of which do not propose to use groundwater from the same basins affected by the Project. As described in the stipulations contained in the Record of Decision for the XpressWest High Speed Passenger Rail project, no new groundwater wells will be developed for that project without additional environmental review. The Calnev Pipeline Expansion Project will use up to 71 acre-feet of groundwater during construction, but none of this water would be drawn from the basins underlying the Project site (BLM, 2012). The amount of groundwater drawdown therefore would be determined solely by the Proposed Action or an action alternative, none of which is expected to cause subsidence during construction or operation.

Construction, operation, maintenance, and decommissioning of the Proposed Action or an action alternative could contribute to cumulative soil erosion impacts. However, SWPPPs or BMP Plans and Comprehensive Drainage, Stormwater, and Sedimentation Control Plans similar to that recommended in Mitigation Measure 3.19-2 (see Section 3.19, *Water Resources*) are standard construction industry practice, as well as legal requirements for certain projects. By following industry standards and legal requirements, the incremental impact of the Proposed Action or alternatives would not cause or contribute to a significant cumulative impact.

3.7.8 Mitigation Measures

Mitigation Measure 3.7-1: Soil Erosion Control Plan Review and Approval. The Project SWPPP or BMP Plan shall be reviewed and approved by a BLM watershed specialist, hydrologist, and/or engineer before implementation. Erosion control and drainage plans for new and existing roads to be utilized for the Project shall be aimed at maintaining to the greatest extent feasible existing soil quality and integrity. In developing the Plan, the Applicant or its contractor shall consult with the BLM to determine the appropriate soil quality objective(s) to be met following construction (for temporary construction disturbances) and following decommissioning (for total site restoration). As part of the erosion control and drainage plans, the Applicant and/or its contractor shall implement an appropriate combination of BMPs in order to meet or exceed the applicable soil quality objective(s) (e.g., maintain or enhance soil quality and function).

All measures and facilities for controlling runoff and erosion shall be in place prior to ground disturbing activities. Desert tortoise fencing shall be installed with minimum impact to existing washes and in such a manner as to limit the increase of sediment. Any desert tortoise fencing that creates spoil piles or excess soil shall have straw wattles or other measures installed to prevent soil transport.

All erosion control facilities shall be monitored immediately following a significant rainfall event. A major rainfall event is defined as one for which flow is visibly detectable within the fenced drainage. All repairs shall be completed prior to the commencement of ground disturbing activity. Any erosion control facilities that are damaged by rainfall shall be repaired within 24 hours of any damage and shall be monitored after any precipitation. Clearance reports and inspection logs shall be submitted to the BLM and the County for approval. Any damage to erosion control facilities shall be reported to the BLM and the County and per the above, no ground disturbing activity shall restart until the facilities are repaired.

Mitigation Measure 3.7-2: Soils and Geotechnical Investigation. Prior to construction of Project facilities, a qualified California-licensed geotechnical engineer shall prepare and submit to BLM a final geotechnical investigation that provides design requirements for foundations, retaining walls/shoring, and excavation. The scope of the geotechnical report shall include the solar array fields, collection line routes, substation and switchyard site, and the operation and maintenance buildings sites. The geotechnical investigation shall expand upon the preliminary investigations as necessary and identify and evaluate the presence of expansive, compressible, liquefiable, or mechanically unstable soils and, if present, shall make recommendations for site preparation or design necessary to avoid or reduce adverse structural impacts. Structural foundations shall not be founded on engineered fill, nor on native soil, unless it is demonstrated that the soils would be adequate to support the foundation. A California-licensed geotechnical engineer shall be retained by the Applicant to be present on the Project site during excavation, grading, and general site preparation activities to monitor the implementation of the recommendations specified in the geotechnical investigation. When/if needed, the geotechnical engineer shall provide structure-specific geologic and geotechnical recommendations that shall be documented in a report approved by the permitting agency.

Mitigation Measure 3.7-3: Septic Site Feasibility Tests. Standard in-situ testing (deep percolation tests) would be performed at locations where septic or alternative wastewater disposal systems are proposed. The Applicant shall document that any proposed sites for septic or alternative wastewater disposal systems meet all applicable standards, and that documentation shall be made available to BLM.

Mitigation Measure 3.7-4: Protection of Desert Pavement. Grading and other methods of ground disturbance in areas covered by desert pavement shall be avoided or minimized. If avoidance of these areas is not possible, the desert pavement surface shall be protected from damage or disturbance from construction vehicles by use of temporary mats on the surface. A plan for identification and avoidance or protection of sensitive desert pavement shall be prepared and submitted to the BLM for review and approval at least 60 days prior to start of construction.

3.7.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to geology and soils would remain. Even with the implementation of these measures, some loss of soil through erosion and the potential for land subsidence, soil instability, and earthquake-related risks to structures would occur.

3.7.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G, Section VI, a project would have a significant impact related to geology and soils if it would:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (Refer to Division of Mines and Geology Special Publication 42);

   ii) Strong seismic ground shaking;

   iii) Seismic-related ground failure, including liquefaction; or

   iv) Landslides;

b) Result in substantial soil erosion or the loss of topsoil;

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

3.7.10.1 Alternative A: Proposed Action

a) Impact Geo-1: Construction, operation, and maintenance of the Project could expose people or structures to potential substantial adverse effects involving strong seismic ground shaking and/or seismic-related ground failure. (Less than Significant with Mitigation Incorporated)

The impacts of faulting and seismicity have been comprehensively addressed in the discussion of direct and indirect impacts in Section 3.7.6.1. Compliance with applicable building standards, incorporation of preliminary design recommendations (DYA, 2010), and implementation of APM 11 and Mitigation Measure 3.7-2 would ensure that the Project is built to avoid or reduce potential risks to facilities, worker safety, and the surrounding environment involving faulting and seismic hazards and would reduce this impact to less than significant. Because this impact would be

site-specific and would not combine with the effects of other projects in the cumulative scenario, the Proposed Action would not contribute to a cumulative effect with respect to criterion a.

b) Impact Geo-2: The Project would result in substantial soil erosion or the loss of topsoil. (Less than Significant with Mitigation Incorporated)

Impacts relating to erosion and loss of topsoil have been comprehensively addressed in the discussion of direct and indirect impacts in Section 3.7.6.1. Compliance with applicable regulations and permits (e.g., implementation of the SWPPP or BMP Plan), and implementation of APMs 4, 12, and 13, and Mitigation Measures 3.7-1 and 3.7-4, would ensure that construction, operation and maintenance and decommissioning of the Project is performed in a manner that reduces or avoids significant impacts to topsoil and erosion and would reduce this potential impact to less than significant. As described in Section 3.7.7, with implementation of Mitigation Measure 3.19-2, the Proposed Action would not have a cumulatively considerable contribution to a significant cumulative impact.

c) Impact Geo-3: The Project may be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site soil subsidence and hydrocompaction. (Less than Significant with Mitigation Incorporated)

The impacts of soil and ground instabilities (non-seismic) have been comprehensively addressed in the discussion of direct and indirect impacts in Section 3.7.6.1. Compliance with applicable building standards, and implementation of APM 11 and Mitigation Measure 3.7-2, would ensure that the Project is built to avoid or reduce potential risks to facilities involving on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse and would reduce this potential impact to less than significant. Impacts related to landslide, lateral spreading, liquefaction, or collapse would be site-specific and would not contribute to a cumulative effect related to these issues. As described in Section 3.7.7, none of the other projects in the cumulative scenario would draw water from the same groundwater basin as the Proposed Action. Therefore, no cumulative effect would occur to which the Proposed Action could contribute with respect to on- or off-site land subsidence due to groundwater drawdown.

d) Impact Geo-4: The Project may be located on expansive soil, creating substantial risks to life or property. (Less than Significant with Mitigation Incorporated)

As discussed in Sections 3.7.2.3 and 3.7.6.1, the potential for the Project site to contain expansive soils is low. Nevertheless, compliance with applicable building codes and implementation of Mitigation Measure 3.7-2 would avoid substantial risks to life or property involving expansive soils and would reduce this potential impact to less than significant. Because this impact would be site-specific and would not combine with the effects of other projects in the cumulative scenario, the Proposed Action would not contribute to a cumulative effect with respect to criterion d.

e) Impact Geo-5: The Project may be located on soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems. (Less than Significant with Mitigation Incorporated)

As discussed in Section 3.7.6.1, the site of the proposed operation and maintenance buildings may have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. Implementation of Mitigation Measure 3.7-3 would reduce this potential impact to a less-than-significant level. Because this impact would be site-specific and would not combine with the effects of other projects in the cumulative scenario, the Proposed Action would not contribute to a cumulative effect with respect to criterion e.

3.7.10.2 Alternative B

CEQA significance determinations would be the same as described above for the Proposed Action under all criteria. Potential impacts of Alternative B would remain less than significant with mitigation. For the same reasons as were discussed in Section 3.7.10.1, the impacts of Alternative B would not be cumulatively considerable.

3.7.10.3 Alternative C

CEQA significance determinations would be the same as described above for the Proposed Action under all criteria. Potential impacts of Alternative C would remain less than significant with mitigation. For the same reasons as were discussed in Section 3.7.10.1, the impacts of Alternative C would not be cumulatively considerable.

3.7.10.4 Alternative D

For criteria a, b, c, and d, CEQA significance determinations would be the same as described above for the Proposed Action. Potential impacts of Alternative D would remain less than significant with mitigation. For the same reasons as were discussed in Section 3.7.10.1, the impacts of Alternative D would not be cumulatively considerable.

e) Impact Geo-D5: The Project may be located on soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems. (Less than Significant)

The alternative location for the operation and maintenance building is further to the north, overlying an alluvium geologic unit, whereas the Proposed Action places the operation and maintenance buildings over the volcanic bedrock geologic unit in the south of the Project site. For this alternative buildings location (i.e., further to the north), the California Plumbing Code (Title 24 Cal. Code Regs. Part 5) requirements indicate that an on-site wastewater treatment system is feasible for the disposal of wastewater generated from the operation and maintenance building (RMT, Inc., 2011b). According to the geotechnical investigation (DYA, 2010), no groundwater, bedrock, or impervious soil exists within 12 feet of the ground surface within the alluvium geologic units, the site is not located within a flood zone, and the site is large enough to serve the

proposed on-site structures with applicable setbacks. This impact would be less than significant, and would not be cumulatively considerable.

3.7.10.5 Alternative E: No Action/No Project

Under CEQA, Alternative E would not result in any impacts from Project construction, operation, maintenance, or decommissioning, because the change from existing conditions would be minimal to none. Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect to geology and soils.

3.7.10.6 Alternative F: CEQA No Project

CEQA significance determinations would be the same as described above for the Proposed Action, or Alternative B, C, or D, depending on the alternative selected by BLM. Potential impacts of Alternative F would remain less than significant with mitigation. For the same reasons as were discussed in Section 3.7.10.1, the impacts of Alternative F would not be cumulatively considerable.

3.7.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would result in no CEQA impacts because there would be no change from existing conditions. Because this alternative would cause no impact to any of the CEQA criteria identified above, Alternative G would not cause or contribute to any cumulative effect to geology and soils.

References

Association of Bay Area Governments (ABAG), Modified Mercalli Intensity Scale, http://www.abag.ca.gov/bayarea/eqmaps/doc/mmi.html, October 15, 2003.

California Geological Survey (CGS), 2002. California Geomorphic Provinces, CGS Note 36.

California Geological Survey (CGS), 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, October 7.

Diaz Yourman & Associates (DYA), 2010. Preliminary Geotechnical Investigation (Phase 1A) Report Caithness Soda Mountain Solar Facility Project Baker, San Bernardino County, California. for RMT, Inc. and Caithness Soda Mountain, LLC.

RMT, Inc., 2011a. Geologic Field Reconnaissance Report: Percolation, Stormwater Runoff, and Channel Scour Potential. Prepared by RMT, Inc., for Caithness Soda Mountain, LLC, Soda Mountain Solar Project.

RMT, Inc., 2011b. Plan of Development Soda Mountain Solar Project, BLM Case Number - CACA49584. March. Prepared for Caithness Soda Mountain, LLC.

San Bernardino County, 2007. County of San Bernardino 2007 General Plan. Prepared by URS Corporation, for County of San Bernardino (as amended).

Terra Physics, 2010. Geophysical Characterization of Subsurface Physical Properties, Caithness LLC—Soda Mountain Solar Facility, Southwest of Baker, San Bernardino County, California. Prepared by Terra Physics, Inc. for Wilson Geosciences, Inc. and RMT, Inc. for the Caithness Soda Mountain, LLC, Soda Mountain Solar Project.

U.S. Bureau of Land Management (BLM), 2012. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/Environmental Impact Report. March 2012.

USGS, 2010. National Seismic Hazards Maps website, Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years USGS Map, May 2008 rev., http://earthquake.usgs.gov/hazards/products/conterminous/2008/data/

Wilson Geosciences, Inc., 2011. Geologic Characterization Report for the Proposed Caithness Soda Mountain Solar Facility near Baker, San Bernardino, California. Prepared by Ken Wilson, Wilson Geosciences, Inc., for RMT, Inc., and Caithness Soda Mountain, LLC.

3.8 Hazards and Hazardous Materials

3.8.1 Introduction

This section describes existing hazards and hazardous materials conditions that could affect or be affected by the Project. This section also describes laws, regulations, plans, and policies related to hazards and hazardous materials that may be relevant to the Project. Hazards that relate to geology and seismicity are discussed in Section 3.7, *Geology and Soil Resources*.

3.8.2 Regional and Local Environmental Setting

3.8.2.1 Aircraft Operations

Potential hazards to aviation from solar energy projects located in the vicinity of airports include electromagnetic interference from the solar facility and transmission lines, glare from the photovoltaic panels, and the risk of birds erroneously viewing the solar arrays as water features and interfering with aviation.

Baker Airport is located approximately 6 miles northeast of the Project site. It has one runway and is used for general aviation (i.e., flights other than military and regularly scheduled airline service and cargo flights). No aircraft are based at the airport. The airport averaged 42 aircraft operations per month for the 12-month period ending May 15, 2012 (Air Nav, 2013).

The County prepared the Baker Airport Comprehensive Land Use Plan (ACLUP) to promote development of compatible land uses in the area influenced by airport operations, to minimize exposure of local residents and businesses to excessive noise levels, to minimize exposure to hazards associated with aircraft operations, and to impose height restrictions for the protection of aircraft operations (San Bernardino County, 1992).

The Project site is not located within the Federal Aviation Regulation (FAR) Part 77 imaginary surface area that would restrict development height within the airport approach and departure areas and is not located within any of the hazard zones of the airport (Runway Protection Zone, Runway Object Free Area, or Obstacle Free Zone), which are designated by the ACLUP.

A private airstrip was previously located at the Desert Studies Center site on the west side of Soda Lake, about 4 miles east of the Project site (Fulton, 2013). This airstrip reportedly was used in the 1950's for the former mineral springs resort. However, the airstrip was never official and was abandoned when the Desert Studies Center took over the facility in 1976.

3.8.2.2 Hazardous Materials

The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or

reactive (causes explosions or generates toxic gases). According to California Health and Safety Code Section 25501, "hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. In some cases, past industrial, military, or commercial activities on a site could have resulted in spills or leaks of hazardous materials to the ground, resulting in soil and/or groundwater contamination. Hazardous materials may also be present in building materials and construction equipment, and released during construction or demolition activities. If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a chemical agent include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release during transportation, storage, or handling of hazardous materials. Disturbance of subsurface soil during construction also can lead to exposure of workers or the public from stockpiling, handling, or transportation of soils contaminated by hazardous materials from previous spills or leaks.

Existing Environmental Site Conditions

The Phase I Environmental Site Assessment (ESA) conducted for the Project site did not find any current or historical Recognized Environmental Conditions (REC) per ASTM International Standard E 1527 (Panorama Environmental, Inc., 2013). This indicates that there was no evidence of any releases of hazardous substances or petroleum products within the requested ROW or within a buffer zone extending 1 mile from the ROW boundary. Visual surveys within this area during the site reconnaissance noted the presence of a range of structures and facilities, including utility lines, cellular tower, telephone line, a service station, and a visitor kiosk.

The following utility lines are located in the vicinity of the Project site: LADWP 500 kV aboveground transmission line strung on steel lattice towers space approximately 1,500 feet apart, located just north of the northern boundary of the proposed ROW; SCE 115 kV aboveground subtransmission line strung on wood poles spaced approximately 750 apart, parallel to the LADWP line; and aboveground distribution and telephone lines strung on wood poles located on the north side of I-15, outside the proposed ROW.

Other features in the vicinity of the Project site include a cellular tower located approximately 0.5 mile west of I-15 just outside the proposed ROW near the north array. The tower is located on a graded pad and enclosed by an approximately 6-foot-high chain-link fence with a locked gate. Another cellular tower is located just east of the Rasor Road service station (discussed below), outside the proposed ROW. This tower is similarly constructed on a graded pad inside a locked gate. An aboveground storage tank (AST) (estimated at 250-gallon capacity) that likely contains diesel fuel for a backup power generator is located at this facility.

Rasor Road Service Station is located at the intersection of I-15 and Rasor Road. The property is partially fenced and includes both paved (asphalt and concrete) and unpaved areas. The facility includes fuel dispensers; two inactive service bays; underground storage tanks (USTs) and associated facilities; a septic system; a small building with a store, restroom, and offices; and

parking areas. Residential structures occupied by facility employees (mobile homes and single-family home) with parking areas and landscaping are located southwest of the service station. Aboveground utility lines strung on wood poles are connected to various buildings. Two empty water storage tanks are located on the periphery of the station property. The service station was inspected for evidence of current or previous chemical releases; no stained soil, stained concrete or asphalt, or stressed vegetation was observed at or adjacent to the property. Evidence of the presence of USTs (access manholes, vent pipes, and vapor collection tank) was observed. One groundwater supply well is located on-site and is used to supply water to the service station facility. The service station is not associated with any existing environmental records and did not have any evidence of environmental contamination at the time of the site reconnaissance.

Isolated trash (e.g., plastic bags, plastic and paper food wrappings, and beverage containers) was observed at various locations within the study area, most of which likely was transported by wind from along I-15. Dump sites characterized by trash and debris, including food containers, electronics (e.g., computer monitors and TVs), household items (e.g., carpet pads, clothing, and kitchen items), paper materials, automobile tires, wooden materials (e.g., construction debris), and metal materials (e.g., beverage and food containers) are located both outside and within the proposed ROW. Dump sites along Rasor Road predominantly were characterized by metal food beverage and food containers that, based on design and fully rusted appearance, appear to have been disposed of at these locations many years ago. Dump sites along Zzyzx Road and Blue Bell Mine Road appear to have been used much more recently and likely are current illegal dump sites. Isolated camping areas characterized by extinguished campfires commonly ringed with collected rocks and other debris and trash were identified within the proposed ROW.

Inactive gravel and borrow pits were observed at several locations within the study area. An inactive borrow pit with six concrete foundations is located north of the service station. The previous use for the foundations was not identified; however, based on the shape of the foundations and the presence of residual hardware, most of the foundations appear to have previously supported ASTs.

No ponds, lagoons, sumps, or catch basins were observed within the study area. Several concrete-lined culverts are present under I-15 that allow stormwater runoff to flow under the highway.

Pesticide Use

Pesticides are used to control living organisms that cause damage or economic loss, or that transmit or cause disease. Pests include insects, fungi, weeds, rodents, nematodes, algae, viruses, and bacteria. Pesticides include herbicides, fungicides, insecticides, rodenticides, and disinfectants, as well as insect growth regulators. In California, adjuvants (substances added to enhance the efficacy of a pesticide) also are subject to the regulations that control pesticides. Based on historical information and existing conditions identified in the Phase I ESA (Panorama Environmental, Inc., 2013), the Project site has not been used for agriculture and therefore would not have been subject to pesticide applications.

3.8.2.3 Emergency Response

The San Bernardino County Office of Emergency Services (OES) is a division of the County Fire Department responsible for disaster planning and emergency management coordination. The OES serves as the lead agency for the County Operation Area, which encompasses all the cities and towns in the County, as well as special districts, volunteer organizations, private industry, and state and federal agencies. OES ensures coordination of disaster response and recovery efforts through program management and during a disaster or other emergency. It staffs the County Emergency Operations Center, which is the primary coordination point for disasters and other emergencies. OES also develops and implements the County's Emergency Operation Plan, which identifies hazards and response, roles, and responsibilities of government during a disaster (OES, 2013). OES could respond to an emergency event at the Project site.

3.8.2.4 Public Health

Location of Exposed Populations and Sensitive Receptors

The general population includes sensitive subgroups that could be at greater risk from exposure to hazardous materials or emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. However, there are no known sensitive receptors in the immediate vicinity of the Project site. The nearest sensitive receptors are located in the town of Baker, approximately 6 miles to the northeast. The closest residence to the Project site is a single-family residence and workforce housing for four employees located adjacent to the service station on Rasor Road, approximately 250 feet southwest of the requested ROW.

Existing Public Health Concerns

Analyses of existing public health issues typically are prepared in order to identify the current status of respiratory diseases (including asthma), cancer, and general health in the population located near proposed project sites to provide a basis on which to evaluate any additional health impacts from the project. Due to the very low population density in the immediate vicinity of the Project site and a lack of available data regarding existing health concerns specific to the local area, a detailed analysis of existing public health issues has not been conducted. Instead, statistics related to the public health status of San Bernardino County residents were obtained through database searches of the California Health Interview Survey (CHIS) conducted by the UCLA Center for Health Policy Research in collaboration with the California Department of Public Health (CDPH) and Department of Health Care Services (CDHCS). Survey results reported comparable health status of San Bernardino County residents as compared with California as a whole. The following County incidence rates as compared to statewide numbers (in parentheses) were reported: cancer, 8.2 percent (8.7 percent); lung disease, 2.4 percent (2.0 percent); heart disease, 5.7 percent (6.2 percent); and asthma, 15.6 percent (13.6 percent) (CHIS, 2013).

Vector-Borne Diseases

Mosquitoes and other arthropods are known to be carriers of many serious diseases. Arthropod-borne viruses ("arboviruses") are viruses that are transmitted by blood-feeding arthropods, such as mosquitoes and ticks, when they bite susceptible humans and animals. There are four main virus agents of encephalitis in the United States: eastern equine encephalitis, western equine encephalitis, St. Louis encephalitis, and La Cross encephalitis, all of which are transmitted by mosquitoes. Most human infections are asymptomatic or result in nonspecific flu-like symptoms such as fever, headache, nausea, and tiredness. However, infection may lead to encephalitis, an inflammation of the brain, with a fatal outcome or permanent neurologic damage in a small proportion of infected persons. West Nile Virus (WNV) is closely related to the St. Louis encephalitis virus and causes similar symptoms. Of these diseases, only the WNV was reported in California in 2012. In 2012, 33 cases of WNV were reported in San Bernardino County and 479 cases were reported in the state (USGS, 2013).

Valley Fever

Coccidioidomycosis, commonly known as valley fever, is primarily a disease of the lungs that is common in the southwestern U.S. and northwestern Mexico. Valley fever infection is highest in California from June to November. It is not a contagious disease, and secondary infections are rare. Valley fever is caused by the fungus Coccidioides, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. These fungal spores become airborne when the soil is disturbed by winds, construction, farming, and other activities. In susceptible people and animals, infection occurs when a spore is inhaled. Many domestic and native animals are susceptible to the disease, including dogs, horses, cattle, coyotes, rodents, bats, and snakes. Valley fever symptoms generally occur within 3 weeks of exposure. People working in certain occupations such as construction, agriculture, and archaeology have an increased risk of exposure and disease because these jobs result in the disturbance of soils where fungal spores are found. Most valley fever cases are very mild. It is estimated that 60 percent or more of infected people either have no symptoms or experience flu-like symptoms and never seek medical attention. However, in extreme cases, valley fever can cause death, usually among patients with compromised immune systems. It is estimated that more than 4 million people live in areas where valley fever fungus is prevalent in the soils. According to the CDPH, San Bernardino County had 45 cases of valley fever in 2011 for an incidence rate of 2.21 cases per 100,000 persons, which is relatively low compared to adjacent Kern County, which had an incidence rate of 305 cases per 100,000 persons (CDPH, 2011).

3.8.2.5 Intentionally Destructive Acts

The number and high profile of international and domestic terrorist attacks during the last decade presents a new and realistic threat to the safety and security of the United States population, infrastructure, and resources. There is a potential for intentional destructive acts, such as sabotage or terrorism events, to cause impacts to human health and the environment. As opposed to industrial hazards, collisions, and natural disasters, where it is possible to estimate event probabilities based on historical statistical data and information, it is not possible to accurately

estimate the probability of an act of terrorism or sabotage; therefore, related analysis generally focuses on the consequences of such events. In general, the consequences of a sabotage or terrorist attack on a solar facility would be expected to be similar to accidental and natural events that could result in an interruption of power service, fire, or hazardous materials release.

The energy generation sector is one of 14 areas of Critical Infrastructure listed by the U.S. Department of Homeland Security. Nearly all of the other areas of Critical Infrastructure are reliant, at least in part, on the energy sector. The level of security needed for any particular facility depends on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event.

The Department of Homeland Security Interim Final Rule setting forth Chemical Facility Anti-Terrorism Standards (6 CFR Part 27) requires facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. Although the Project would not be covered by the standards, the BLM recommends that the Applicant implement a minimum level of security consistent with the Standards. The DOE published a draft Vulnerability Assessment Methodology for Electric Power Infrastructure in 2002 (DOE, 2002). Energy sector members also are leading a significant voluntary effort to increase planning and preparedness, including infrastructure protection and cyber security. The North American Electric Reliability Corporation (NERC) has established a Critical Infrastructure Protection Program to coordinate and improve physical and cybersecurity for the bulk power system of North America as it relates to reliability (NERC, 2013).

For regional and local environmental setting information regarding fire hazards, see Section 3.20.2, relating to Wildland Fire Ecology.

3.8.2.6 Active and Historical Mining Activities

No abandoned mined lands have been identified on the Project site. There is a California Department of Transportation (Caltrans) mineral materials site for aggregate extraction (Opah Ditch pit mine) located northwest of the requested ROW. Caltrans has filed an application with the BLM to expand this mining operation, but it would not extend into the requested ROW. Mining claims also exist within Sections 17 and 20, north of Blue Bell Mine Road and outside the requested ROW. See Section 3.10 regarding impacts to mineral resources.

3.8.3 Applicable Laws, Regulations, Plans, and Standards

3.8.3.1 Federal

The U.S. Environmental Protection Agency (USEPA) is responsible for enforcing federal regulations regarding hazardous materials and hazardous waste. The primary legislation governing hazardous materials and hazardous waste are the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA).

Resource Conservation and Recovery Act (RCRA)

RCRA (42 USC §6901 et seq.), enacted in 1976, governs the management and disposal of solid and hazardous waste. Congress enacted RCRA to address the increasing problems the nation faced from its growing volume of municipal and industrial waste. RCRA amended the Solid Waste Disposal Act of 1965. It set national goals for:

1. Protecting human health and the natural environment from the potential hazards of waste disposal
2. Promoting conservation of energy and natural resources
3. Reducing the amount of waste generated, through source reduction and recycling
4. Ensuring the management of waste in an environmentally sound manner (USEPA, 2013).

It is now most widely known for the regulations promulgated under RCRA that set standards for the treatment, storage, and disposal of hazardous waste in the United States.

The USEPA has published waste management regulations, which are codified in Title 40 CFR Parts 239 through 282. Regulations regarding management of hazardous waste begin in Part 260. As noted below, California has enacted laws and created regulations that are at least as stringent as the federal regulations. Furthermore, the RCRA statute authorizes states (including California) to carry out many of the functions of the federal law through their own hazardous waste programs if such programs have been approved by the USEPA.

Subtitle C directs the USEPA to establish controls on the management of hazardous wastes from their point of generation, through their transportation and treatment, storage and/or disposal. Because RCRA requires controls on hazardous waste generators (i.e., sites that generate hazardous waste in the first place), transporters, and treatment, storage, and disposal facilities (i.e., facilities that ultimately treat and/or dispose of or recycle the hazardous waste), (40 CFR Parts 260 through 264) the overall regulatory framework has become known as the “cradle to grave” system. The program exacts stringent recordkeeping and reporting requirements on generators, transporters, and operators of treatment, storage and disposal facilities handling hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act and Superfund Amendments and Reauthorization Act

CERCLA (42 USC §9601), also known as Superfund, created a tax on the chemical and petroleum industries to provide for response and cleanup of hazardous substances that may endanger public health or the environment. CERCLA established requirements for the treatment of abandoned hazardous waste sites and provided for liability of persons responsible for releases of hazardous waste at these sites. The SARA (42 USC §103) amended CERCLA to increase state involvement and required Superfund actions to consider state environmental laws and regulations. The applicable part of SARA for the Project is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA) (42 USC §§11004-11049).

EPCRA establishes requirements for federal, state, and local governments, as well as Indian Tribes and industry members, regarding emergency planning and reporting on hazardous and toxic chemicals. Key sections of the law include:

> ***Section 304*:** Requires immediate notification to the local emergency planning committee (LEPC) and the state emergency response commission (SERC) when a hazardous material is released in excess of its reportable quantity (RQ). If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
>
> ***Section 311*:** Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.

Clean Air Act

Regulations under the CAA (42 USC §7401 et seq.; 49 CFR Part 68) are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a Threshold Quantity (TQ) or greater of listed regulated substances to develop a risk management plan (RMP) that includes hazard assessments and response programs to prevent accidental releases of listed chemicals.

Toxic Substances Control Act

The Federal Toxic Substances Control Act of 1976 (TSCA; 15 USC §§2601–2629) and RCRA established a program administered by the USEPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste.

Hazardous Materials Transport Act

The U.S. Department of Transportation (USDOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 (49 USC §§5101-5127) directs the USDOT to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. 49 CFR Parts 171–180 regulate the transportation of hazardous materials, the types of material that are defined as hazardous, and the marking of vehicles transporting hazardous materials.

Federal Aviation Administration Regulations

The FAA regulates aviation at regional, public, private, and military airports and regulates objects affecting navigable airspace including structures taller than 200 feet. USDOT and Caltrans also require the applicant to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration (USDOT, 2007). According to 14 CFR Part 77.17, notification allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing any adverse impacts on the safe and efficient use of navigable airspace. Any structure that would constitute a hazard to air navigation, as defined in 14 CFR Part 77, requires issuance of a permit from Caltrans's Division

of Aeronautics. The permit is not required if the FAA aeronautical study determines that the structure has no impact on air navigation.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Administration (OSHA) administers the Occupational Safety and Health Act (29 USC §651), which requires special training of handlers of hazardous materials, notification to employees who work in the vicinity of hazardous materials, and acquisition from the manufacturer of material safety data sheets (MSDSs). MSDSs provide workers and emergency response personnel with information about potentially harmful materials and procedures for safe handling of them in the workplace. The Act also requires the training of employees to remediate any hazardous material accidental releases.

CDCA Plan of 1980, as amended

The CDCA Plan requires that in all areas designated Multiple Use Class L, M, or I, fire suppression measures be taken in accordance with specific fire management plans subject to such conditions as the authorized officer deems necessary, such as the use of motorized vehicles, aircraft, and fire retardant chemicals.

3.8.3.2 State

Department of Toxic Substance Control Regulations

The DTSC is the primary agency in California that regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. The DTSC regulates hazardous waste in California primarily under the authority of the federal RCRA and the California Health and Safety Code (primarily Title 22, Division 20, Chapters 6.5 through 10.6; and Title 22, Division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Government Code Section 65962.5 (commonly referred to as the Cortese List) includes the DTSC-listed hazardous waste facilities and sites, CDPH lists of contaminated drinking water wells, sites listed by the SWRCB as having UST leaks and which have had a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites that have had a known migration of hazardous waste and/or material.

California Occupational Safety and Health Administration Regulations

The California Occupational Safety and Health Administration (Cal-OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal-OSHA standards are generally more stringent than federal regulations. An employer is required to monitor worker exposure to listed hazardous substances and notify workers of occurrences (8 Cal. Code Regs. §§337 to 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Safe Drinking Water and Toxics Enforcement Act

The Safe Drinking Water and Toxics Enforcement Act (Health and Safety Code §25249.5 et seq.) identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment (OEHHA).

Aboveground Petroleum Storage Act

Assembly Bill 1130 (2007) updated the Aboveground Petroleum Storage Act of 1990 (Health and Safety Code §§25270 to 25270.13) and requires the owner or operator of a tank facility with an aggregate storage capacity greater than 1,320 gallons of petroleum to file an inventory statement with the local Certified Unified Program Agency (CUPA) and to prepare a Spill Prevention, Control, and Countermeasure (SPCC) plan. An SPCC plan must identify appropriate spill containment or equipment for diverting spills from sensitive areas, as well as discuss facility-specific requirements for the storage system, inspections, recordkeeping, security, and personnel training. The CUPA in the vicinity of the Project site the San Bernardino County Fire Department – Hazardous Materials Division.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act (Health and Safety Code §25500 et seq.; 19 Cal. Code Regs. §2620, et seq.), requires local governments to regulate local businesses using hazardous materials in excess of certain quantities to prepare a Hazardous Materials Business Plan (HMBP) that describes their facilities, inventories, emergency response plans, and training programs to their local CUPA and to report releases to their CUPA and the California OES. Hazardous materials are defined as unsafe raw or unused materials that are part of a process or manufacturing step. They are not considered hazardous waste. Health concerns pertaining to the release of hazardous materials, however, are similar to those relating to hazardous waste. HMBPs shall include the following: (1) a hazardous material inventory in accordance with the minimum standards for business plans (19 Cal. Code Regs. §§2729.2 to 2729.7); (2) emergency response plans and procedures (19 Cal. Code Regs. §2731); and (3) an appropriate training program (19 Cal. Code Regs. §2732). Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state. Each business shall prepare a HMBP if that business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following:

1. 500 pounds of a solid substance,
2. 55 gallons of a liquid,
3. 200 cubic feet of compressed gas,
4. A hazardous compressed gas in any amount, and
5. Hazardous waste in any quantity.

California Accidental Release Program (CalARP)

The California Accidental Release Program (CalARP) regulates the registration and handling of regulated substances (Health and Safety Code §§25531 to 25543.3; 19 Cal. Code Regs. §§2735.1 to 2785.1). Regulated substances are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing regulated substances at or above Threshold Planning Quantities (TQ) must register with their local CUPA and prepare an RMP.

Process Safety Management of Acutely Hazardous Materials

The regulation governing process safety management of acutely hazardous materials (8 Cal. Code Regs. §5189) requires facility owners that store a TQ of hazardous materials to develop and implement effective safety management plans that ensure that hazardous materials are handled safely. Acutely hazardous materials are substances that possess toxic, reactive, flammable or explosive properties. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Health and Safety Code §41700

This statute states, “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

Hazardous Waste Control Law

The Hazardous Waste Control Law (HWCL) (Health and Safety Code §§25100 to 25249) created the state hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The law is implemented by regulations (22 Cal. Code Regs. §66250 et seq.) that describe the following requirements for the proper management of hazardous waste:

1. Identification and classification;
2. Generation and transportation;
3. Design and permitting of recycling, treatment, storage, and disposal facilities;
4. Treatment standards;
5. Operation of facilities and staff training; and
6. Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the HWCL and its implementing regulations, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

Cal EPA adopted regulations in 1996 to establish a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) and designated local agencies called Certified Unified Program Agencies (CUPAs). This program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, the locally designated CUPA. The Program Elements consolidated under the Unified Program are:

1. Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a., Tiered Permitting),
2. Aboveground Petroleum Storage Tank SPCC,
3. Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or "Community-Right-To-Know"),
4. CalARP,
5. UST Program, and
6. Uniform Fire Code Plans and Inventory Requirements.

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. It is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA. The Hazardous Materials Division of the San Bernardino County Fire Department is the CUPA in the Project area.

California Highway Patrol Regulations

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the laws and regulations of Vehicle Code Section 3200.5 for transportation of either:

1. Hazardous materials shipments for which the display of placards is required by state regulations; or
2. Hazardous materials shipments of more than 500 pounds, which would require placards if shipping greater amounts in the same manner.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (14 Cal. Code Regs. §§1150 to 1152.10). Inhalation hazards face similar, more restrictive rules and regulations (13 Cal. Code Regs. §§1157 to 1157.8). Radioactive materials are restricted to specific safe routes for transportation of such materials.

Other California Regulations

Other regulations applicable to the Project include:

1. High Voltage Electrical Safety Orders (8 Cal. Code Regs. §2700 et seq.), which establish essential requirements and minimum standards for installation, operation, and maintenance of electrical equipment to provide practical safety and freedom from danger.

2. Fire Prevention Standards for Electric Utilities (14 Cal. Code Regs. §§1250 to 1258), which provide specific exemptions from electric pole and tower firebreak and electric conductor clearance standards, and specifies when and where standards apply. It establishes minimum clearance requirements for flammable vegetation and materials surrounding structures.

3.8.3.3 Local

San Bernardino County Hazardous Waste Management Plan

AB 2948 (Chapter 1504, Statutes of 1986), commonly known as the Tanner Bill, authorizes counties to prepare Hazardous Waste Management Plans (HWMPs) in response to the need for safe management of hazardous wastes. The HWMP was adopted by the County of San Bernardino Board of Supervisors and approved by the CDHS in February 1990. The HWMP serves as the primary planning document for the management of hazardous waste in San Bernardino County. The HWMP identifies the types and amounts of wastes generated in the County; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated in the County; and identifies goals, policies, and actions for achieving effective hazardous waste management.

San Bernardino County Fire Department – Hazardous Materials Division

The San Bernardino County Fire Department – Hazardous Materials Division is the local agency responsible for the enforcement of a variety of hazardous materials management requirements. It is the state-designated CUPA for San Bernardino County. The purpose of the CUPA program is to provide a comprehensive approach to reduce the overlapping and sometimes conflicting requirements of different governmental agencies. The CUPA provides consolidation and consistency in reporting requirements, permit formats, inspection criteria, enforcement standards, and fees for various hazardous materials programs. The CUPA is required by state law to maintain a list of facilities within the County that are known to use, store, and/or generate hazardous materials/wastes. Facilities that handle hazardous materials or generate hazardous waste must obtain a permit from the CUPA. The San Bernardino County Fire Department manages the hazardous material and hazardous waste programs noted above.

San Bernardino County General Plan

The following policies identified in the Circulation and Infrastructure (CI) and Safety (S) elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

Policy CI 11.2. Support the safe management of hazardous materials to avoid the pollution of both surface and groundwaters. Prohibit hazardous waste disposal facilities within any area known to be or suspected of supplying principal recharge to a regional aquifer.

Policy S 2.1. Because reducing the amount of waste generated in this County is an effective mechanism for reducing the potential impact of these wastes on the public health and safety and the environment, and because legislation encourages the reduction, to the extent feasible, of hazardous waste, this jurisdiction will encourage and promote practices that will, in order of priority: (1) reduce the use of hazardous materials and the generation of hazardous wastes at their source; (2) recycle the remaining hazardous wastes for reuse; and (3) treat those wastes that cannot be reduced at the source or recycled. Only residuals from waste recycling and treatment will be land disposed.

Policy S 2.5. Minimize the risk of exposure to hazardous substances by residential and other sensitive receptors through the application of program review and permitting procedures.

Policy S 8.1. Ensure the safety of airport operations and surrounding land uses.

Policy S 9.1. Maintain projected emergency access needs in the periodic review of the County's Hazard Mitigation Plan.

Policy S 9.2. Ensure that future developments have no less than two points of access for emergency evacuation and for emergency vehicles, in the event of wildland fires and other natural disasters.

Policy D/S 1.1. Designate the following roads and highways as evacuation routes in the in the Desert Region: Interstates 15 and 40, U.S. 95 and 395 and State Highways 18, 58, 62, 127, 138, 178 and 247.

San Bernardino County Fire Department Fire Prevention Standards

In accordance with the California Fire Code, the San Bernardino County Fire Department incorporated the Fire Apparatus Access Roads standard (No. 503.1) and Fire Personnel Key Boxes (Knox Box) standard (No. 506) into its operational standards. Under these standards, all required building plans must be submitted to the Fire Department for review and approval of access roads and points, and Knox Box mounting location, position, and operating standards prior to installation (SBCFD, 2013).

Baker Airport Comprehensive Land Use Plan

The ACLUP for Baker Airport defines the planning boundary for the airport as the FAR Part 77 horizontal surface. Within this boundary the area is designated into three Safety Review Areas; Areas 1, 2, and 3, which reflect a particular level and type of aviation related hazard or risk within each safety area. No portion of the Project would be located within any of the three Safety Review Areas for the airport (San Bernardino County, 1992).

3.8.4 Analytical Methodology

The analysis of potential impacts of the Proposed Action and alternatives regarding hazards and hazardous materials focuses on possible impacts to the health and safety of the public and the environment. Impacts are identified and evaluated based on relevant lead agency standards, polices, and guidelines. Information regarding hazardous materials use and health and safety practices for the build alternatives were reviewed for this analysis, including the following:

1. Phase I ESA (Panorama Environmental, Inc., 2013).
2. Soda Mountain Solar Project, Plan of Development, Appendix E, Materials Safety Data Sheets (Caithness Soda Mountain, LLC, 2011).
3. Soda Mountain Utility Corridor Constraints Evaluation, (RMT, Inc., 2009).
4. Information regarding hazardous materials use and health and safety practices for the Proposed Action.

3.8.4.1 Risk of Accidents and Spills

This section presents the evaluation of the potential for the transportation, storage, and use of hazardous materials during construction and operation of the Project to affect the surrounding community and the environment. It is recognized that some hazardous materials must be used for Project construction and operation; all chemicals identified in connection with the Project are evaluated. In order to assess the potential for a release of hazardous materials to affect the public or the environment, this analysis examines the type and quantity of hazardous materials to be used, the manner in which the Applicant would handle, store, and dispose of hazardous materials and hazardous wastes, and the transportation of hazardous materials to and from the facility.

Engineering and administrative controls concerning hazardous materials use are included as part of the Proposed Action and alternatives. Engineering controls are the physical or mechanical systems that can prevent the spill of hazardous material from occurring, or that can either limit the amount of a spill or to a confined area. Examples of engineering controls are storage tanks and secondary containment basins. Administrative controls are the rules and procedures that workers at the facility must follow that would help to prevent accidents or to minimize releases if they do occur. These procedures typically are established in worker safety training and emergency response plans. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and from causing harm to the public or environment.

This analysis reviews and evaluates the Applicant’s proposed use of hazardous material. In conducting this analysis, three steps were followed:

1. Review the types and quantities of hazardous materials proposed for on-site use as listed in the Plan of Development and other information provided by the Applicant, and described in Section 2.4.2.10.

2. Review and evaluate the engineering and administrative controls proposed by the Applicant to prevent spills and respond to accidents.

3. Analyze the theoretical impacts on the public or the environment of a greatest-consequence spill of hazardous materials, as reduced by the engineering and administrative controls proposed by the Applicant. When such controls would be sufficient, no further mitigation is recommended. If additional mitigation measures would further reduce or avoid impacts of the Proposed Action or an Alternative, additional prevention and response controls are proposed.

3.8.4.2 Emergency Response

This analysis assesses potential impacts to public safety that could result if the Project impaired implementation of an emergency response or evacuation plan. This assessment first determines whether local emergency response or evacuation plans have been adopted and then whether the Project would impede emergency evacuation routes or emergency response actions.

3.8.4.3 Aircraft Operations

Research on the presence of public and private airports within the vicinity of the Project, FAA regulations, and review of San Bernardino County airport land use plans was conducted to evaluate whether the Project would adversely affect commercial, military, or personal air navigation safety. San Bernardino County operates under a state statutory provision that allows the County to provide compatible land use planning for airports through an alternative process in which the County works directly with cities in coordinating development and land use planning around airports instead of through a separate airport land use commission. The County and each affected city determine the processes to accomplish airport land use planning and determine the agency responsible for preparation of airport land use compatibility plans.

3.8.4.4 Intentionally Destructive Acts

Intentionally destructive acts could include, for example, malicious mischief, vandalism, or domestic or foreign terrorist attacks. This analysis of impacts related to intentionally destructive acts is based on the screening criteria for vulnerability assessments of chemical facilities and electric power infrastructure and assesses the following questions: Is the Project a critical electric infrastructure facility? Does the facility use any of the chemicals on the list of regulated substances in 40 CFR Section 68.130? What would be the estimated severity of impact from a release of hazardous materials from the site or from power disruption?

3.8.4.5 Active or Historical Mining Activities

Research on the presence of active or abandoned mines within or adjacent to the Project site was conducted to evaluate whether the Project would adversely affect or be affected by active or historical mining activities.

3.8.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to reduce the potential for adverse impacts related to hazards and hazardous materials from the Project:

APM 22: General material safety data sheets for all hazardous materials stored on site will be retained on site during Project construction and operation.

APM 23: On-site fueling of equipment and vehicles shall be completed in areas at least 100 feet away from drainages, or in designated fueling areas. Fuel stored on site will be located in areas with secondary containment, unless secondary containment is built into the tank.

APM 24: Transformers shall be inspected for oil leakage on a regular basis and diversionary structures shall be provided for all oil-containing equipment, including transformers, at the Project site.

APM 25: Employees shall attend a health and safety training and shall be trained in the proper protocol for notification and cleanup of hazardous materials.

APM 26: A Health and Safety Plan, which complies with all OSHA and Cal-OSHA guidelines for the types of activities being performed, shall be prepared and presented to all personnel on site during construction and operation.

APM 27: During conductor installation, guard structures consisting of temporary H-frame poles shall be erected over any natural or manmade obstacles to shield them from falling objects.

3.8.6 Direct and Indirect Effects

3.8.6.1 Alternative A: Proposed Action

Aircraft Operations

The Project site is not located within any FAR Part 77 imaginary surface area, nor within any of the designated hazard zones of the Baker Airport. The Proposed Action also would not affect operations at the Desert Studies Center private airstrip. Therefore, there would be no impacts associated with the Proposed Action on navigable airspace in the vicinity of the Project site.

Environmental Site Contamination

No sites identified in the Phase I ESA are included on the National Priorities List published by the USEPA pursuant to the CERCLA (42 USC §9604(c)(3)). Similarly, no properties with potential to affect soil and groundwater beneath the Project site were identified in the database searches. No hazardous substance release sites (as designated by DTSC or the RWQCB, pursuant to the California Hazardous Substances Account Act, Health and Safety Code Section 25356) are located within the Project site (Panorama Environmental, Inc., 2013).

Three properties were identified in regulatory databases that are within 1 mile of the requested ROW boundary for the Project site. The first of these, the Rasor Road service station, is not associated with any existing environmental records and did not have any evidence of environmental impacts at the time of the site reconnaissance. The Rasor Road service station was listed as a registered UST owner/user and as having four USTs. The station site was listed in the County permit database as a registered hazardous materials handler at an active facility with 0 to 10 employees. The remaining two properties comprise two cellular towers. These were listed in the County permit database as registered hazardous materials handlers at an active facility with 0 to 10 employees, or at an unstaffed remote facility. There was no evidence of any release of petroleum products or other chemicals to the environment from any of these three properties.

As described in Section 2.4.2.13, *Health and Safety*, construction-related safety programs and procedures would be required, including preparation of a Health and Safety Plan. Implementation of this plan would minimize potential exposure to existing, unknown hazardous materials present on-site. Impacts associated with site contamination are considered unlikely, and if these were to occur, would have a minor and localized effect.

Risk of Accidents and Spills

Construction

Construction of the Proposed Action would involve the use of hazardous materials. These could include paints, thinners, solvents, sealants, fuels, oils and lubricants, drilling mud (for drilling cable conduits under I-15 and possibly for water well drilling), and chemicals related to the reverse osmosis water treatment system such as sulfuric acid, sodium hypochlorite, and caustic soda. The quantities and concentrations of these hazardous substances are not expected to reach regulated levels. Facility transformers would contain dielectric fluid that does not include polychlorinated biphenyls (PCBs).

As explained Section 2.4.2.10, *Waste and Hazardous Materials Management*, hazardous wastes generated during construction of the Proposed Action would include an estimated 1 cubic yard per week of empty hazardous materials containers and approximately 100 gallons of used oil, spent solvents, and oily rags every 3 months. Fuel tanks and hazardous materials would be stored at staging areas, and wastes, such as empty hazardous materials containers and used oil, spent solvents, and oily rags, would also be accumulated prior to disposal and stored in wind-proof and wildlife-proof containers. As described within APM 23, on-site fueling of vehicles would occur within the staging areas, and fuels would be stored within secondary containment areas.

The use, storage, and disposal of hazardous materials and wastes associated with the Proposed Action could result in potential adverse health and environmental impacts if these materials were used, stored, or disposed of improperly, causing accidents and spills. Potential direct and indirect impacts of such releases could degrade soil and water quality or expose humans and wildlife to the harmful effects of hazardous materials. As described in the APMs, the Applicant would store all hazardous materials in the manner specified by the manufacturer and in accordance with local, state, and federal regulations. All potential contaminants would be stored and used at least 50 feet

from any defined or constructed channels or basins at all times. To reduce the risk of spills a SPCC Plan would be developed and implemented prior to Project construction. In addition to the implementation of a SPCC Plan, the Applicant would also prepare and implement a Stormwater Pollution Prevent Plan (SWPPP) or BMP plan, as described in Section 3.19, *Water Resources*. This Plan would describe methods to reduce the potential for spills and establish procedures to minimize the effect of accidental releases on water quality. Best management practices (BMPs) established in the SWPPP or BMP plan would include protection measures for the temporary on-site storage of diesel fuels, hydraulic fluid, lubricants, and other hazardous materials used during construction, including requirements for secondary containment and berming to contain a potential release and to prevent any such release from reaching a nearby waterway. All employees would receive training in the proper use, storage, and handling of hazardous materials; equipment and materials storage would be routinely inspected for leaks and records maintained documenting compliance with regulations for the storage and handling of hazardous materials, as required by the SWPPP or BMP plan.

The Applicant would also prepare a Health and Safety Plan, which would comply with OSHA and Cal-OSHA guidelines for the types of activities being performed. All personnel on site during construction and operation would be trained and given access to all appropriate OSHA and Cal-OSHA guidelines, and a safety and compliance coordinator would be assigned to the Project.

During Project construction activities, the potential exists that undocumented subsurface utilities (e.g., a natural gas line) or structures (e.g., an UST) might be encountered and damaged, resulting in a release of a hazardous material. The potential for such incidents would be reduced by thoroughly screening for subsurface structures in areas prior to commencement of any subsurface work. Screening activities would include use of DigAlert (Underground Services Alert of Southern California), visual observations, hand digging, and use of buried line locating equipment.

The implementation of the SPCC, SWPPP/BMP plan, and Health and Safety Plan would ensure that the risk of hazards associated with accidents and spills would be minimized. Although these hazards could still occur, the likelihood of this is considered low. Under the Proposed Action there could be minor impacts during construction associated with accidental release of hazardous materials, but these impacts would be short-term and localized.

Operation and Maintenance

Project operation and maintenance would require the routine transport, use, and disposal of hazardous materials and hazardous wastes such as diesel fuel, hydraulic fluid, water treatment chemicals, oily rags, and spent batteries. A limited amount of #2 diesel and gasoline petroleum fuels (approximately 500 gallons each) may be stored in the staging areas within above-grade steel tanks located within secondary containment. Limited pesticide use to control noxious weeds would occur in accordance with an Invasive Weed Management Plan following approval from the BLM (Appendix E-2). Pesticide use, if needed, would be limited to non-persistent, immobile pesticides applied only in accordance with manufacturer directions and all regulations for

pesticide use. Any pesticide applications would be conducted within the framework of BLM and Department of the Interior policies.

The use of pesticides and other hazardous materials and the generation of hazardous waste does present a risk that an accidental release could occur that could affect public health or the environment. Numerous federal, state, and local regulations ensure the safe transportation, use, storage, and disposal of hazardous materials. The Hazardous Materials Release Response Plans and Inventory Act of 1985 requires the preparation of a HMBP that describes the hazardous materials handled and demonstrates facility compliance with applicable handling, storage and disposal regulations. The HMBP must be reviewed and approved by the local CUPA, which would be responsible for facility inspections.

In addition to the implementation of a HMBP, the Applicant would also prepare a Health and Safety Plan (APM 26) that would designate responsibilities and actions to be taken in the event of a fire or other emergency during operation and maintenance. This Plan, including details of fire prevention and suppression measures, and a worker safety plan, would be provided to the BLM and the San Bernardino County Fire Department for approval prior to construction. The Plan would document worker safety practices and address health and safety issues associated with normal and unusual (emergency) conditions associated with the high-voltage systems, mechanical systems, and other solar plant operations. Personnel would be properly trained in the handling of relevant chemicals and wastes and instructed in the procedures to follow in case of a chemical spill or accidental release.

Routine transportation of hazardous materials to the site could create a hazard to the public or the environment if materials were improperly handled, or accidentally released. Caltrans and the California Highway Patrol (CHP) regulate the transportation of hazardous materials and wastes, with stringent packaging requirements, licensing and training for hazardous materials truck operators, chemical handlers, and hazardous waste haulers.

The implementation of the HMBP and Health and Safety Plan and compliance with Caltrans and CHP requirements would ensure that the risk of hazards associated with accidents and spills during the routine use, storage, transportation, and disposal of hazardous materials would be minimized. Although these hazards could still occur, the likelihood of this is considered low. Under the Proposed Action there could be impacts during operation and maintenance activities associated with accidental release of hazardous materials, but these impacts would be minor and localized.

Decommissioning

Project decommissioning would require the use of fuel and lubricants for construction vehicles and equipment, as well as the transport and disposal of hazardous materials used at the Project facility. Solar panels would be returned to the vendor for appropriate recycling. Inadvertent release of hazardous materials from spills or leaks could occur. Compliance with existing laws and regulations would ensure that the risk of hazards associated with accidents and spills during decommissioning would be minimized. Although these hazards could still occur, the likelihood of

this is considered low. Impacts associated with any accidental release of hazardous materials would be minor and localized.

Emergency Response

Construction

Project construction would occur primarily in undeveloped areas, accessed by Rasor Road, Blue Bell Mine Road, and Arrowhead Trail. All of these roads are accessed via I-15, which San Bernardino County has designated as an emergency evacuation route. Project construction would not impair implementation of, or physically interfere with, an adopted emergency response or evacuation plan. Local roads are unlikely to be used as emergency routes because of the remote location of the Project site. The Proposed Action would not result in any impacts on emergency response activities during construction.

Operation and Maintenance

Operation and maintenance of the Project would neither cause any road closures nor impair access to local roads. Internal access roads to the solar plant would be designed to meet the San Bernardino County Fire Department requirements described above. Both the Rasor Road gate and Blue Bell Mine Road gate would be equipped with a Knox Box or similar access device. The Proposed Action would not result in any impacts on emergency response activities during construction.

Decommissioning

Project decommissioning activities would be similar to construction activities, and so also would not impair implementation of or physically interfere with an adopted emergency response plan.

Public Health

Construction

As described in Section 3.8.2.4, incidence of WNV in San Bernardino County, and therefore the risk to public health from this vector-borne disease, is extremely low. Implementation of Mitigation Measure 3.19-2, which requires a comprehensive drainage, stormwater, and sedimentation control plan, would reduce the potential for unintentional ponding of water on-site or downstream of the Project. This would reduce the risk of mosquito breeding on or near the site, and therefore would reduce the risk for workers and the public of contracting vector-borne diseases.

Additionally, incidence of valley fever in San Bernardino County is also low. However, fugitive dust generated during Project construction could expose workers to Coccidioides fungal spores that may be present in desert soils. Implementation of control measures required by MDAQMD Rule 403.2 and APMs 1 through 8 (discussed in Section 3.2, *Air Resources*) would reduce fugitive dust during the construction phase, which would reduce the risk to workers of contracting valley fever. Under the Proposed Action it is not considered likely that there would be public health impacts associated with construction activities.

Operation and Maintenance

Similar to construction, implementation of Mitigation Measure 3.19-2 during operation and maintenance would reduce risk of vector-borne diseases. Implementation of MDAQMD Rule 403.2 control measures and APMs 1 through 8 would reduce fugitive dust, which would reduce the risk of valley fever infections. Under the Proposed Action it is not considered likely that there would be public health impacts associated with operation of the Project.

Decommissioning

Similar to construction, implementation of Mitigation Measure 3.19-2 during decommissioning would reduce risk of vector-borne diseases. Implementation of MDAQMD Rule 403.2 control measures and APMs 1 through 8 during decommissioning would reduce fugitive dust, which would reduce the risk of valley fever infections. Under the Proposed Action it is not considered likely that there would be public health impacts associated with decommissioning of the Project.

Intentionally Destructive Acts

Construction

The risk to workers or to the public from intentionally destructive acts during construction would be low, as public access to the proposed construction and staging areas would be controlled by security and fencing.

Operation and Maintenance

None of the chemicals proposed for use or storage at the solar plant site are on the list of regulated substances in 40 CFR Section 68.130; thus, the Project facility would not be covered by the security standards for chemical facilities. The consequences of release of all the hazardous materials used at the facility (diesel fuel, mineral oil, and hydraulic fluid) would not cause a threat to the health and safety of the surrounding community due to the limited quantity and toxicity of the substances and the distance to the nearest receptors. Nonetheless, the BLM encourages energy project applicants to implement at least a minimum level of security consistent with standards to protect California's electrical infrastructure from intentionally destructive acts.

The Applicant's proposed security measures, described in Sections 2.4.2.4 and 2.4.4.2 would minimize the potential for power disruptions or hazardous materials release caused by outside parties. The risk to workers or the public from damage to the Project as a result of intentionally destructive acts would be low because public access would be controlled by security and fencing. Security fencing would be installed around the solar plant site perimeter and around the substation and switchyard. Fencing would be approximately 6 feet high with 1 foot of barbed wire at the top of the fence. Once the Project is constructed, non-emergency access would be limited to the access gates at Rasor Road and Blue Bell Mine Road. Under the Proposed Action it is not considered likely that there would be impacts associated with intentionally destructive acts during operation and maintenance of the Project.

Decommissioning

The risk to workers or to the public from intentional acts during decommissioning would be low because public access to construction and staging areas would be controlled by security and fencing.

3.8.6.2 Alternative B

Construction

Alternative B would result in similar impacts associated with hazards and use and generation of hazardous materials to those described for the Proposed Action. However, because the Project site would be smaller for Alternative B than for the Proposed Action, Alternative B would involve a smaller geographic area and shorter construction and decommissioning periods than the Proposed Action. Consequently, the hazards and hazardous materials-related impacts associated with the construction of Alternative B would be reduced relative to the Proposed Action.

Operation and Maintenance

Alternative B would result in similar impacts during operation and maintenance associated with hazards and use and generation of hazardous materials to those described for the Proposed Action. The geographic area within which Alternative B would be developed would be smaller than for the Proposed Action, and so would limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the operation and maintenance of Alternative B would be reduced relative to the Proposed Action.

Decommissioning

Alternative B would result in similar impacts during decommissioning- associated with the hazards and the use and generation of hazardous materials to those described for the Proposed Action; however, Alternative B's smaller footprint would constrain the area within which accidents or upsets could occur and thereby release hazardous materials. Consequently, the hazards and hazardous materials-related impacts associated with decommissioning Alternative B would be reduced relative to the Proposed Action.

3.8.6.3 Alternative C

Construction

Alternative C would result in similar impacts associated with hazards and use and generation of hazardous materials to those described for the Proposed Action. However, because the solar plant site would be smaller for Alternative C than for the Proposed Action, Alternative C would involve a smaller geographic area and shorter construction and decommissioning periods than the Proposed Action. Consequently, the hazards and hazardous materials-related impacts associated with the construction of Alternative C would be reduced relative to the Proposed Action.

Operation and Maintenance

Alternative C would result in similar impacts during operation and maintenance associated with hazards and use and generation of hazardous materials as the Proposed Action. However, the geographic area within which Alternative C would be developed would be smaller than for the Proposed Action, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the operation and maintenance of Alternative C would be reduced relative to the Proposed Action.

Decommissioning

Alternative C would result in similar impacts during decommissioning- associated with the hazards and the use and generation of hazardous materials to those described for the Proposed Action; however, Alternative C's smaller footprint would constrain the area within which accidents or upsets could occur and thereby release hazardous materials. Consequently, the hazards and hazardous materials-related impacts associated with decommissioning Alternative C would be reduced relative to the Proposed Action.

3.8.6.4 Alternative D

Construction

Alternative D would result in similar impacts associated with hazards and use and generation of hazardous materials to those described for the Proposed Action. However, because the solar plant site would be smaller for Alternative D than for the Proposed Action, Alternative D would involve a smaller geographic area and shorter construction and decommissioning periods than the Proposed Action. Consequently, the hazards and hazardous materials-related impacts associated with the construction of Alternative D would be reduced relative to the Proposed Action.

Operation and Maintenance

Alternative D would result in similar impacts during operation and maintenance associated with hazards and use and generation of hazardous materials to those described for the Proposed Action. However, the geographic area within which Alternative D would be developed would be smaller than for the Proposed Action, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the operation and maintenance of Alternative D would be reduced relative to the Proposed Action.

Decommissioning

Alternative D would result in similar impacts during decommissioning associated with hazards and the use and generation of hazardous materials to those described for the Proposed Action; however, Alternative D's smaller footprint would constrain the area within which accidents or upsets could occur and thereby release hazardous materials. Consequently, the hazards and

hazardous materials-related impacts associated with decommissioning Alternative D would be reduced relative to the Proposed Action.

3.8.6.5 Alternative E: No Action/No Project

If Alternative E were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, this No Action/No Project Alternative would result in no changes to conditions related to hazards and hazardous materials.

3.8.6.6 Alternative F: CEQA No Project

Alternative F generally would cause similar hazard and hazardous materials-related impacts to those described for the action alternatives during construction, operation, maintenance, and decommissioning. However, a greater number of water delivery trucks would be visiting the Project site during all phases of the Project. Therefore, the potential for accidental release of gasoline, diesel fuel, oil, and lubricants into the environment from these trucks would be greater compared to the Proposed Action or any of the other action alternatives.

3.8.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, this alternative would result in no changes to conditions related to hazards and hazardous materials.

3.8.7 Cumulative Effects

3.8.7.1 Hazardous Materials and Risk of Upset

Depending on the pathway of exposure, the geographic scope for cumulative effects relating to hazardous materials would be the air basin, watershed boundary, groundwater basin, or extent of affected soils. Materials delivery routes also would be included in the event of a traffic accident-related spill. The temporal scope of hazardous materials impacts would occur throughout the life of the Project.

Many of the cumulative projects identified in Table 3.1-3 could cause similar impacts related to the potential for release of hazardous materials during routine use, transport, storage, and disposal for construction and operation of these projects. As discussed above, construction, operation, maintenance, and decommissioning of the Project or any of the other action alternatives could result in minor, localized impacts related to the potential to encounter hazardous materials, or to the potential for accidents during the routine use of hazardous materials to release such materials into the environment or cause harmful exposures.

Impacts caused by the cumulative projects, combined with the Project or any of the other action alternatives, would not result in an adverse cumulative hazards or hazardous materials impact even if all of the projects were to be constructed simultaneously. The Project (or an alternative) and all cumulative projects would be required to adhere to the robust body of regulations that govern hazardous materials transport, storage, and handling, water quality BMPs, and worker safety and because these laws and other requirements have been adopted with cumulative safety considerations in mind and to be sufficiently protective of human health and safety under cumulative conditions. Compliance with these measures would ensure that impacts related to exposure to hazardous materials would be minimized and/or avoided. The Proposed Action and other action alternatives would be constructed, operated, and decommissioned in compliance with these requirements; therefore, none would cause or contribute to a significant cumulative effect related to hazards or hazardous materials.

3.8.7.2 Intentionally Destructive Acts

The risk of intentionally destructive acts resulting from the Project or another action alternative that could combine with the individual threat levels of other past, present, or reasonably foreseeable future energy generation projects is considered low. The geographic scope of the cumulative impacts analysis for such threat would be the California Desert area. Potential cumulative effects could occur at any time during the lifespan of the Project, but would not persist past closure and decommissioning.

Other renewable energy generation projects in the cumulative scenario are identified in Table 3.1-3 and include similar utility-scale proposals and projects such as the Silurian Valley Wind Project, Silurian Valley Solar Project, and the Abengoa Mojave Solar Project. These facilities also have been determined to have a low threat level. The human and environmental consequences of a realized threat of an intentionally destructive act could be comparable regardless of an energy generation facility's size or power output; however, although possible, it is unlikely that the targeting of renewable energy facilities in the Project area would result in a catastrophic event. Intentionally destructive acts are by their nature unpredictable, and it would be speculative to conclude that the Project would cause or contribute to a significant cumulative effect in this regard.

3.8.8 Mitigation Measures

No mitigation measures are recommended to reduce Project-related impacts from hazards and hazardous materials.

3.8.9 Residual Effects

Because no mitigation measures are recommended, residual impacts related to hazards and hazardous materials would be as described in Sections 3.8.6 and 3.8.7.

3.8.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G, Section VIII, a project would have a significant impact related to hazards and hazardous materials if it would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area; or,

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The following criterion is discussed in Section 3.20, Wildland Fire Ecology:

h) Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

3.8.10.1 Alternative A: Proposed Action

a) Impact Haz-1: The Proposed Action would involve the routine transport, use, or disposal of hazardous materials, which could create a hazard to the public or the environment through accidents and spills. (Less than Significant)

Construction

Hazardous materials proposed for use during construction activities include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paint. As explained Section 2.4.2.10, *Waste and Hazardous Materials Management*, hazardous wastes generated by the Project would include an estimated 1 cubic yard per week of empty hazardous materials containers and approximately 100 gallons of used oil, spent solvents, and oily rags every 3 months. Fuel tanks and hazardous materials would be stored at staging areas, and wastes, such as empty hazardous materials containers and used oil, spent solvents, and oily rags, would also be accumulated prior to disposal. The use, storage, and disposal of hazardous materials and wastes associated with the

Project could result in potential adverse health and environmental impacts if these materials were used, stored, or disposed of improperly, causing accidents and spills. Potential direct and indirect impacts of such releases could degrade soil and water quality or expose humans and wildlife to the harmful effects of hazardous materials.

As described in the APMs, the Applicant would store all hazardous materials in the manner specified by the manufacturer and in accordance with local, state, and federal regulations. All potential contaminants would be stored and used at least 50 feet from any defined or constructed channels or basins at all times. If required, a SPCC Plan would be developed prior to Project construction in accordance with Title 4 of the Code of Federal Regulations, Part 112.

The construction SWPPP would describe methods to reduce the potential for spills and establish procedures to minimize the effect of accidental releases. BMPs established in the SWPPP would include protection measures for the temporary on-site storage of diesel fuels, hydraulic fluid, lubricants, and other hazardous materials used during construction, including requirements for secondary containment and berming to contain a potential release and to prevent any such release from reaching a nearby waterway. All employees would receive training in the proper use, storage, and handling of hazardous materials; equipment and materials storage would be routinely inspected for leaks and records maintained documenting compliance with regulations for the storage and handling of hazardous materials, as required by the SWPPP.

The Applicant also would prepare a Health and Safety Plan, which would comply with OSHA and Cal-OSHA guidelines for the types of activities being performed. All personnel on site during construction and operation would be trained and given access to all appropriate OSHA and Cal-OSHA guidelines, and a safety and compliance coordinator would be assigned to the Project.

During construction activities for the Project, the potential exists that undocumented subsurface utilities (e.g., a natural gas line) or structures (e.g., an UST) might be encountered and damaged, resulting in a release of a hazardous material. The potential for such incidents would be reduced by thoroughly screening for subsurface structures in areas prior to commencement of any subsurface work. Screening activities would include use of DigAlert (Underground Services Alert of Southern California), visual observations, hand digging, and use of buried line locating equipment.

Compliance with existing regulations, BMPs, the HMBP, the Health and Safety Plan, and other plans during the Project phases in which each plan is applicable would reduce hazards to construction workers, the public, and the environment to less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

Operation and Maintenance

Project operation and maintenance would require the routine transport, use, and disposal of hazardous materials and hazardous wastes such as diesel fuel, hydraulic fluid, water treatment chemicals, oily rags, and spent batteries. A limited amount of #2 diesel and gasoline petroleum

fuels (approximately 500 gallons each) may be stored in the staging areas within above grade steel tanks located within secondary containment. Limited pesticide use to control noxious weeds would occur in accordance to an Invasive Weed Management Plan following approval from the BLM. If hazardous materials or wastes were improperly handled, a release could occur that could affect public health or the environment. Pesticide use, if needed, would be limited to non-persistent, immobile pesticides applied only in accordance with manufacturer directions and all regulations for pesticide use. Any pesticide applications would be conducted within the framework of BLM and Department of Interior policies.

Numerous federal, state, and local regulations ensure the safe transportation, use, storage, and disposal of hazardous materials. The Applicant must prepare a HMBP that describes the hazardous materials handled and demonstrates facility compliance with applicable handling, storage and disposal regulations. The HMBP must be reviewed and approved by the local CUPA, the Hazardous Materials Division of the San Bernardino County Fire Department, which would be responsible for facility inspections.

The Applicant's Health and Safety Plan would designate responsibilities and actions to be taken in the event of a fire or other emergency during operation and maintenance. The Health and Safety Plan, including fire prevention and suppression, and a worker safety plan, would be provided to BLM and the San Bernardino County Fire Department for approval before the Applicant receives an NTP.

The Applicant's Health and Safety Plan would document worker safety practices and would address health and safety issues associated with normal and unusual (emergency) conditions associated with the high voltage systems, mechanical systems, and other solar plant operations. Personnel would be properly trained in the handling of relevant chemicals and wastes and instructed in the procedures to follow in case of a chemical spill or accidental release.

Routine transportation of hazardous materials to the site could create a hazard to the public or the environment if materials were improperly handled, or indirectly could result in an incremental increase in the potential for accidents; however, Caltrans and the California Highway Patrol regulate the transportation of hazardous materials and wastes, with stringent packaging requirements, licensing and training for hazardous materials truck operators, chemical handlers, and hazardous waste haulers.

Compliance with existing laws and regulations would reduce impacts related to the routine use, storage, transportation, and disposal of hazardous materials during operation and maintenance to less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

Decommissioning

Project decommissioning would require the use of fuel and lubricants for construction vehicles and equipment, as well as the transport and disposal of hazardous materials used at the facility. PV panels would be returned to the vendor for appropriate recycling. Inadvertent release of

hazardous materials from spills or leaks could occur. Compliance with existing laws and regulations would reduce potential impacts related to the routine use, storage, transportation, and disposal of hazardous materials during decommissioning to less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

b) Impact Haz-2: The Proposed Action would require the use of hazardous materials, which could result in a significant hazard to the public or the environment if released into the environment. (Less than Significant)

Construction

As described above, Project construction would require the limited use of hazardous materials that could result in potential adverse health and environmental impacts if these materials were used, stored, or disposed of improperly, causing accidents, spills, or leaks. Implementation of construction water quality BMPs and of measures contained in the SPCC, if required, and Health and Safety Plan would reduce the potential for accidental releases and ensure quick response to any spills to minimize impacts to the environment.

Additionally, during construction, undocumented subsurface utilities or structures might be encountered and damaged, resulting in a release of a hazardous material. The potential for such incidents would be reduced by thoroughly screening for subsurface structures in areas prior to commencement of any subsurface work, as described above.

With compliance with existing hazardous materials, stormwater, and utility regulations, the potential hazard to the public or the environment from a reasonably foreseeable upset or accident condition involving the release of hazardous materials would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

Operation and Maintenance

Hazardous materials that may be used and stored during operation and maintenance could include paints, thinners, solvents, sealants, lubricants, and chemicals related to the reverse osmosis water treatment system such as sulfuric acid, sodium hypochlorite, and caustic soda. The quantities and concentrations of these hazardous substances are not expected to reach regulated levels. Facility transformers would contain non-PCB-rated dielectric fluid. Hazardous materials could leak or spill if handled improperly or if containment is damaged from a seismic event, fire, or other accident.

Compliance with applicable federal, state, and local regulations, the HMBP, SPCC, and the Health and Safety Plan would reduce both the potential for accidental releases of hazardous materials and the impacts of such releases on the public or the environment. With compliance with existing hazardous materials regulations, the potential hazard to the public or the environment from an accidental release of hazardous materials would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

Decommissioning

Project decommissioning would require the use of fuel and lubricants for construction vehicles and equipment, as well as transport and disposal of hazardous materials used at the facility. PV panels would be returned to their vendor for recycling. Inadvertent releases of hazardous materials from spills or leaks could occur. As discussed above, with compliance with existing laws and regulations, the potential hazard to the public or the environment from an accidental release of hazardous materials would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

c) The Proposed Action would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. (No Impact)

There are no schools located within 0.25 mile of the Project site; therefore, the Project would cause no impact related to this criterion. Because the Project would have no impact with respect to this criterion, it would not cause or contribute to any cumulative impact.

d) The Proposed Action would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, thereby, would not create a significant hazard to the public or the environment. (No Impact)

The Phase I ESA (Panorama Environmental, Inc., 2013) included a database search of regulatory agency lists of hazardous materials sites, including those compiled pursuant to Government Code Section 65962.5. According to the database search, the Project is not proposed on a known hazardous materials site. Therefore, the Project would cause no impact related to this criterion. Because the Project would have no impact in this respect, it would not cause or contribute to any cumulative impact.

e) The Proposed Action is not located within an airport land use plan and so would not result in a related safety hazard for people residing or working in the project area. (No Impact)

The Project site is not located within the Baker Airport land use plan area, and so would cause no impact related to this criterion. Because the Project would have no impact in this respect, it would not cause or contribute to any cumulative impact.

f) The Proposed Action is not located within the vicinity of a private airstrip, and so would not result in a related safety hazard for people residing or working in the project area. (No Impact)

The Project site is located approximately 4 miles west of the private airstrip at the Desert Studies Center, and would cause no impact related to this criterion. Because the Project would have no impact in this respect, it would not cause or contribute to any cumulative impact.

g) The Proposed Action would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (No Impact)

Project construction would occur primarily in undeveloped areas, accessed by Rasor Road, Blue Bell Mine Road, and Arrowhead Trail. All of these roads are accessed via I-15, which San Bernardino County has designated as an emergency evacuation route. Project construction would not impair implementation of, or physically interfere with, an adopted emergency response or evacuation plan. Local roads are unlikely to be used as emergency routes because of the remote location of the Project site. Operation and maintenance of the Project would neither cause any road closures nor impair access to local roads. Internal access roads to the solar plant would be designed to meet the San Bernardino County Fire Department requirements described above. Both the Rasor Road gate and Blue Bell Mine Road gate would be equipped with a Knox Box or similar access device. Project decommissioning activities would be similar to construction activities, and so also would not impair implementation of or physically interfere with an adopted emergency response plan; no impact would result. Because the Project would have no impact with respect to this criterion, it also would not cause or contribute to a cumulative impact.

3.8.10.2 Alternative B

Alternative B would cause similar hazard and hazardous materials-related impacts as the Project. However, because the solar plant site would be smaller for this alternative than for the Project, the alternative would involve a shorter construction and decommissioning periods than the Project, and would use and transport less hazardous material. Additionally, the geographic area within which this alternative would be developed would be smaller than for the Project, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the construction of this alternative would be reduced relative to the Project. CEQA significance for Alternative B would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

3.8.10.3 Alternative C

Alternative C would cause similar hazard and hazardous materials-related impacts as the Project. However, because the solar plant site would be smaller for this alternative than for the Project, the alternative would involve a shorter construction and decommissioning periods than the Project, and would use and transport less hazardous material. Additionally, the geographic area within which this alternative would be developed would be smaller than for the Project, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the construction of this alternative would be reduced relative to the Project. CEQA significance for Alternative C would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

3.8.10.4 Alternative D

Alternative D would cause similar hazard and hazardous materials-related impacts as the Project. However, because the solar plant site would be smaller for this alternative than for the Project, the alternative would involve a shorter construction and decommissioning periods than the Project, and would use and transport less hazardous material. Additionally, the geographic area within which this alternative would be developed would be smaller than for the Project, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the construction of this alternative would be reduced relative to the Project. CEQA significance for Alternative D would be less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

3.8.10.5 Alternative E: No Action/No Project

If Alternative E were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, the No Action/No Project Alternative would result in no changes to conditions related to hazards and hazardous materials; no impact would result. Because Alternative E would have no impact with respect to this criterion, it would not cause or contribute to any cumulative CEQA impact.

3.8.10.6 Alternative F: CEQA No Project

Alternative F would generally cause the same types of hazard and hazardous materials-related impacts as the Proposed Action during construction, operation and maintenance, and decommissioning. However, a greater number of water delivery trucks would be visiting the Project site during all phases of the Project. Therefore, the potential for accidental release of gasoline, diesel fuel, oil, and lubricants into the environment from these trucks would be greater compared to the Proposed Action. Impacts would remain less than significant. This less-than-significant impact would not cause or contribute to any significant cumulative impact for the reasons discussed in Section 3.8.7.

3.8.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW and No County Permit

If Alternative G were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, this alternative would result in no changes to conditions related to hazards and hazardous materials; no impact would result. Because Alternative G would have no impact with respect to this criterion, it would not cause or contribute to any cumulative CEQA impact.

References

AirNav, 2013. Baker Airport. [www.airnav.com/airport/0O] Accessed May 21, 2013.

Caithness Soda Mountain, LLC, 2011. Soda Mountain Solar Project, Plan of Development.

California Department of Public Health (CDPH), 2011. Coccidioidomycosis Yearly Summary Report, 2011.

California Health Interview Survey (CHIS), 2013. AskCHIS database results. [http://ask.chis.ucla.edu/main/default.asp] Accessed July 2, 2013.

Fulton, Robert, 2013. Personal communication, July 8, 2013.

North American Electric Reliability Corporation (NERC), 2013. Critical Infrastructure. [http://www.nerc.com/pa/CI/Pages/default.aspx] Accessed July 2, 2013.

Panorama Environmental, Inc., 2013. Phase I Environmental Site Assessment, Soda Mountain Solar Project, BLM Case No. CACA 49584, May 2013.

RMT, Inc., 2009. Soda Mountain Utility Corridor Constraints Evaluation, Soda Mountain Solar Project, San Bernardino County, California, November 2009.

San Bernardino County Fire Department (SBCFD), 2013. [http://www.sbcfire.org/fire_marshal/planning_engineering/fire_prevention_standards.aspx] Accessed July 2, 2013.

San Bernardino County Office of Emergency Services (OES), 2013. www.sbcfire.org/oes, accessed May 22, 2013.

San Bernardino County Planning Department, 1992. Baker Airport Comprehensive Land Use Plan, March 1992.

United States Department of Energy (DOE), 2002. Draft Vulnerability Assessment Methodology, Electric Power Infrastructure, September 30, 2002.

United States Environmental Protection Agency (USEPA), 2013. History of RCRA. [http://www.epa.gov/osw/laws-regs/rcrahistory.htm] Accessed October 3, 2013.

United States Geological Survey (USGS), 2013. West Nile Virus Map: California-Human, [www.diseasemaps.usgs.gov/wnv_ca_human.html] Accessed May 21, 2013.

3.9 Lands and Realty

3.9.1 Introduction

This section describes the existing land use conditions on the Project site and in the surrounding area and discusses the impacts that would occur with implementation of the Proposed Action or alternatives. Potential land and realty effects may occur from conflicts with existing or authorized land uses or conflicts with applicable land use plans, policies, or regulations. Impacts associated with other existing land use activities such as recreation and mineral resources extraction are discussed in other sections of this chapter. Land use considerations are assessed in this section by comparing the current and proposed land uses, land ownership, and land use designations or limitations of land use (such as those provided by rights-of-way, deeds, permits and land use classifications from the CDCA). During the scoping process for the PA/EIS/EIR, the USEPA provided one comment related to lands and realty, requesting that the analysis discuss how the Project would support or conflict with the objectives of federal, state, tribal, or local land use plans, policies and controls in the Project area (see Appendix B). This comment is addressed in this section.

The Project's potential impacts on the use of vehicle routes (off- and on-road, respectively) are addressed in Section 3.13, *Recreation*, and in Section 3.16, *Transportation and Travel Management*.

3.9.2 Regional and Local Environmental Setting

The Project is proposed in a valley within the Soda Mountains in San Bernardino County. The valley forms a corridor for both transportation routes and utilities. However, mountainous terrain at its northern and southern ends constricts the available width, creating a natural limit on the amount of space available for future ROWs to be added to the corridor (RMT, 2009).

3.9.2.1 General Characteristics

The Project would be located entirely on BLM-administered land within San Bernardino County. The site consists of vacant, undeveloped desert land. The nearest town is Baker, about 6 miles northeast of the Project site.

San Bernardino County is located on the eastern edge of the Los Angeles metropolitan region. It is the largest county within the continental United States by area, containing three distinct planning regions, which are identified as Valley, Mountain, and Desert. The Project site is within the Desert Planning Region, which is the largest of the three regions. The Desert Planning Region includes a significant portion of the Mojave Desert and contains about 93 percent of the land within San Bernardino County. This region is an assemblage of mountain ranges interspersed with long, broad valleys that often contain dry lakes (San Bernardino County, 2007).

3.9.2.2 Land Ownership/Management

The Project would be located entirely on BLM-administered land. BLM specially designated areas in close proximity to the Project site include the Soda Mountains Wilderness Study Area (WSA) to the northwest and Rasor Off-Highway Vehicle (OHV) Recreation Area to the southeast. Within the WSA along its southeast boundary is the existing Opah Ditch pit mine, and to the northeast are some active mining claims.

Three military installations are located within a 25-mile radius of the requested ROW for the Project. The Naval Air Weapons Station (NAWS) China Lake and the National Training Center Fort Irwin are to the northwest, and Marine Air Ground Task Force Training Command Twentynine Palms is to the southeast.

Just east of the Project site is the western boundary of the 1.6-million-acre Mojave National Preserve, which is managed by the National Park Service.

3.9.2.3 Existing Uses

The land uses associated with the Project site and surrounding area include undeveloped lands, recreation, mineral development, and use of a designated utility corridor for oil and gas pipelines, electricity transmission and distribution lines, communication lines and facilities, and I-15.

Table 3.9-1 contains a list of BLM-authorized uses, and Table 3.9-2 contains a list of pending applications, as shown on the Master Title Plats and Historical Indices, and as contained in the BLM's Legacy Rehost 2000 (LR 2000) automated land and mineral records system. The parameters of the report (Geographic Report with Customer) from LR2000 were to identify authorized and pending actions by serial numbers and by Meridian, Township, Range and Section (MTRS) based on the legal description provided by the Applicant (Soda Mountain Solar, LLC, 2013).

3.9.3 Applicable Laws, Regulations, Plans, and Standards

3.9.3.1 Federal

Federal Land Policy and Management Act (FLPMA) of 1976

The FLPMA establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. FLPMA Title V, Section 501, establishes the BLM's authority to grant ROWs for generation, transmission, and distribution of electrical energy (FLPMA, as amended, 2001). The BLM is responsible for responding to requests regarding the development of energy resources on BLM-administered lands in a manner that balances diverse resource uses and takes into account the long-term needs for renewable and non-renewable resources for future generations.

TABLE 3.9-1
AUTHORIZED LAND USES WITHIN OR IN CLOSE PROXIMITY TO THE PROJECT SITE

Serial No.	Holder	Type of Use	Case Type/Authority	Granted	Expiration
CACA 000128	CA Division of Highways	Sec. 17 Material Site	282106 11-09-1921; 42STAT0216	12/26/1931	Indefinite
CACA 020195	Sprint Communications	Interstate Fiber Optic Line	286203 10-21-1976; 43USC1761	04-22-1988	04/21/2038
CACA 021604	AT&T	Interstate Fiber Optic Line	286203 10-21-1976; 43USC1761	01-12-1989	12/31/2039
CACA 031609	American Tower Corp	Cellular Tower Site	286001 10-21-1976; 43USC1761	02-01-1998	01-31-2028
CACA 031610	Verizon Wireless	Tenant Owned Communication Site – Zzyzx Road	286001 10-21-1976; 43USC1761	04-01-1996	12-31-2036
CACA 046587	New Cellular Wireless PCS, LLC	Tenant Owned Communication Site – Rasor Road	286001 10-21-1976; 43USC1761	01-10-2005	12-31-2034
CACA 047429	Nextel of California	Communication Site Tenant – Rasor Road	286001 10-21-1976; 43USC1761	04-19-2006	12-31-2026
CACA 047430	Nextel of California	Communication Site Tenant – Zzyzx Road	286001 10-21-1976; 43USC1761	04-19-2006	12-31-2026
CACA 048433	Federal Highway Admin.	Opah Ditch Material Site	2821103 08-27-1958; 072Stat0916; 23USC317(A)	11-07-2006	12-31-2036
CACA 048497	DesertXpress Enterprises	Interstate Rail Road Line	284001 11-09-1921; 42STAT0216	12-19-2011	12-31-2040
CACA 050398	Royal Street Communications	Communication Site Tenant – Zzyzx Road	282106 11-09-1921; 42STAT0216	02-13-2009	12-31-2038
CACA 050471	Royal Street Communications	Communication Site Tenant – Zzyzx Road	282106 11-09-1921; 42STAT0216	03-10-2009	12-31-2038
CACA 053937	Southern California Edison	12 kV Electric Line to Shamrock Communication Site	285002 10-21-1976; 43USC1761	03-21-2013	12-31-2042
CACA 053944	Southern California Edison	12 kV Electric Line	285003 10-21-1976; 43USC1761	02-21-2013	12-31-2042
CALA0165890	CA Dept. Public Works	Federal Aid Highway	2821103 08-27-1958; 072Stat0916; 23USC317(A)	10-09-1959	Not indicated; is usually Indefinite
CALA0168999	Cal Nev Pipeline Co – GATX Terminals Corp	Refined Fuel Pipeline	288100 02-25-1925 041STAT0437; 30USC185	01-01-1964	Indefinite
CARI0 001730	Southern California Edison	Hoover Dam 138 kV Power Transmission Line and Telephone Line	285130 12-21-1928; 045STAT1057;43USC617D Boulder Dam Project	06-21-1933	Indefinite
CARI0002879	Southern California Edison	Power Line	285002 10-21-1976; 43USC1761	06-13-1963	06-13-2013
CAS 005597	CalNevPipeline Co - Kinder Morgan Pipeline Partners	14-inch Petroleum Products Pipeline	288100 02-25-1925 041STAT0437; 30USC185	05-07-1995	05-23-2024

NOTE: Data in this report was obtained from LR2000, Geographic Report with Customer; parameters – existing and pending cases, by MTRS based on legal description provided by Applicant, then further refined manually by checking against legal description by quarter section.

TABLE 3.9-2
PENDING APPLICATIONS WITHIN OR IN CLOSE PROXIMITY TO THE PROJECT SITE

Serial No.	Applicant	Type of Use	Case Type/Authority	Application Filed
CACA 049138	Calnev Pipeline Company	Interstate Oil and Gas Pipeline	288100 02-25-1925 041STAT0437; 30USC185	06-18-2007
CACA 049584[a]	Soda Mountain Solar LLC	Solar Energy Development Facility	283103 10-21-1976; 43USC1761	12-14-2007
CACA 053529[b]	Calnev Pipeline Co – Kinder Morgan Pipeline Partners	Oil and Gas Pipeline[b]	288100 02-25-1925 041STAT0437; 30USC185	02-06-2012
CACA 053936[c]	Southern California Edison	Electric Power Line	285003 10-21-1976; 43USC1761	07-09-2012

NOTES:
[a] LR2000 has not been updated to reflect Soda Mountain Solar, LLC as the Applicant
[b] This case covers a portion of the same route as CAS 005597, which is now under National Park Service jurisdiction
[c] This case replaces CARI 02879 (see Table 3.9-1)

Section 368 of the Energy Policy Act of 2005

Section 368 of the Energy Policy Act of 2005 directed federal agencies to identify corridors for oil, gas, and hydrocarbon pipelines, and electricity transmission and distribution facilities (energy corridors) on federal land in the 11 contiguous western states. The West-wide Energy Corridor (WWEC) ROD designated 20 utility corridors in California (BLM, 2009). As shown on Figure 1-2, a 2-mile wide corridor (27-225) runs parallel to I-15 through the Project vicinity, covering most of the requested ROW, and is designated both under Section 368 and the CDCA Plan.

California Desert Conservation Area Plan of 1980, as amended

The CDCA encompasses 25 million acres in southern California designated by Congress in 1976 through the FLPMA. The BLM manages about 10 million of those acres. Congress directed the BLM to prepare and implement a comprehensive long-range plan for the management, use, development, and protection of public lands within the CDCA. The CDCA Plan is based on the concepts of multiple-use, sustained yield, and maintenance of environmental quality. The CDCA Plan provides overall regional guidance for BLM-administered lands in the CDCA and establishes long-term goals for protection and use of the California desert.

The CDCA Plan establishes four multiple use classes (MUCs); MUC guidelines; and plan elements for specific resources or activities, such as motorized vehicle access, recreation, and vegetation harvesting. The MUCs classify lands as follows: Class C (Controlled) includes areas recommended as suitable for wilderness designation; Class L (Limited Use) lands are managed for generally lower intensity uses for the purpose of protecting sensitive natural, scenic, ecological, and cultural resource vales; Class M (Moderate Use) provides for a wide variety of present and future uses including mining, livestock grazing, recreation, and energy and utility development; and Class I (Intensive Use) provides for concentrated use of lands and resources to meet human needs, where reasonable protection is provided for sensitive natural and cultural

resources. Unclassified lands consist of scattered and isolated parcels that are managed on a case-by-case basis. The Project is located within MUCs L, M, and I (see Figure 1-2).

Chapter 7 of the CDCA Plan provides a process for amending the Plan. The Project site is within the CDCA, but is not identified in the CDCA Plan as suitable for solar power generation. Therefore, if the BLM decides to approve the issuance of a ROW grant, a CDCA Plan amendment would be required. The Project proposes a Category 3 amendment because it requests a specific use or activity, which is not currently authorized by an existing plan element—specifically, the Energy Production and Utility Corridors Element. In analyzing the request to amend the CDCA Plan, the analysis of the proposed amendment will:

1. Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment;
2. Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element;
3. Determine the environmental effects of granting and/or implementing the applicant's request;
4. Consider the economic and social impacts of granting and/or implementing the applicant's request;
5. Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from federal, state, and local government agencies; and
6. Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.

These steps are documented throughout this PA/EIS/EIR. Specifically, the regulatory context for granting the requested amendment is described throughout Chapter 3; the process of determining if alternative locations for the Project are available within the CDCA is documented in Chapter 2; and the analysis of the environmental effects of granting the Applicant's request for the Project or an another alternative reqiring a Plan Amendment is described throughout Chapter 3. The BLM's consideration of economic and social impacts of the Project and alternatives requiring a Plan Amendment is documented in Section 3.14, Socioeconomics and Environmental Justice. As described in Chapter 4, Consultation, Coordination, and Public Involvement, the BLM held publicly noticed scoping meetings and solicited scoping comments prior to the preparation of the Draft PA/EIS/EIR, and the Draft PA/EIS/EIR will be circulated for a 90-day public comment period during which time the public and agencies have an opportunity to comment on the Draft Plan Amendment. The BLM will respond to comments received during the public comment period in the Proposed PA/Final EIS/EIR. Additionally, publication of the Proposed PA/Final EIS/EIR will initiate a 30-day protest period on the Proposed PA to the Director of the BLM in accordance with 43 CFR Section 1610.5-2. Regardless of whether the Project is approved, the BLM could elect to amend the CDCA Plan to identify the development footprint as suitable or unsuitable for solar energy development.

The BLM's evaluation of the effets of the Plan Amendment on its desert-wide obligation to achieve and maintain a balance between resource use and resource protection is documented throughout Chapter 3, and the Project and alternatives' consistency with the CDCA Plan Multiple Use Class Guidelines is evaluated below in Section 3.9.11.

The Project's proposed connection to the existing Marketplace-Adelanto 500 kV transmission line would consist of a high-voltage substation and switchyard that would be located within an existing designated federal Section 368 Energy Corridor (Corridor number 27-225). The CDCA Plan identifies designated corridors as suitable for transmission of electricity. Therefore, no CDCA Plan Amendment would be needed to allow the proposed connection to the 500 kV line.

3.9.3.2 State and Local

Because the Project would be developed entirely on federal lands, no state or local regulations associated with lands and realty are applicable to this analysis. An analysis of the Project's consistency with the San Bernardino County General Plan is provided in Appendix I.

3.9.4 Analytical Methodology

This analysis focuses on land use conflicts that would result from implementation of the Proposed Action and alternatives. Land use conflicts are identified and evaluated based on existing and pending land uses, land uses proposed as part of the Project and under the cumulative scenario, land use designations, and standards and policies related to land use. Land use compatibility is based on the intensity and patterns of land use to determine whether the Project would result in incompatible uses.

The BLM Historical Indices (HIs), Master Title Plats (MTPs), and the automated LR2000 provide information related to authorized and pending uses of the BLM-administered lands affected by the Project and alternatives, BLM land use classifications, and federal withdrawals that might affect use of the BLM-administered land. The BLM's Washington Office and California State Office web sites provide information relating to designated utility corridors potentially affected by the Project. Other resources reviewed and relied upon in preparing this analysis include BLM Lands and Realty-related manuals, handbooks, information and instruction memoranda, and the CDCA Plan.

3.9.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address potential impacts to lands and realty.

3.9.6 Direct and Indirect Effects

3.9.6.1 Alternative A: Proposed Action

Impacts to Authorized Uses

The Project would directly impact portions of the designated Section 368 designated energy corridor number 27-225 by removing those portions of the corridor from future use for the duration of the Project. As shown in Figure 3.9-1, the Project would occupy the entire width of the portion of this corridor on the southeastern side of I-15; however, in the valley in which the Project is proposed to be located, the corridor shifts to the northwest as shown in Figure 3.9-1 to avoid the slopes directly adjacent to I-15 north of the proposed East Arrays, such that most of the corridor's width is northwest of I-15 in this area. On the northwest side of I-15, the proposed ROW would occupy a 0.5-mile to 1-mile-wide portion of the corridor, leaving 0.4-mile to 0.5-mile-wide areas of the corridor on either side of the ROW which could accommodate several major utility lines in the future.

Multiple-Use Classes

The Applicant is requesting a ROW grant from the BLM for approximately 4,179 acres of public land. The Project site is located within the BLM's California Desert District and within the planning boundaries of the CDCA Plan. If a ROW grant is approved for the Project, then a land use plan amendment also would be required to identify the site in the CDCA Plan as suitable for the proposed use. The proposed ROW grant area is located on 2,108 acres of designated Class L lands, 2,321 acres of Class M lands, and188 acres of Class I lands. The total acreage of the final ROW, and thus the final acreage of Class L, M, and I lands that would be restricted for the life of the Project, would be determined after construction when the Applicant would relinquish the unused portion of the ROW, as determined by final engineering and micro-siting. Electrical generation facilities, including solar generation, may be allowed in each of these classes after NEPA requirements are met. Construction would result in disruptions to existing allowable land uses, particularly including on-site dispersed recreation activities and OHV use, which are discussed in Section 3.13, *Recreation*. No changes in the MUC classification are proposed or would be required prior to approving the requested ROW grant and, as discussed in the consistency analysis below in Section 3.9.10, the land use activities associated with the Project would be consistent with MUC Guidelines. Although the Project would be consistent with MUC Guidelines, approval of the ROW grant would restrict use opportunities on the Project site for the anticipated 30-year lifespan of the Project, making this land unavailable for certain types of other uses. After the Project has been decommissioned, the lands within the Project site boundary would again be available for all uses consistent with the applicable MUC Guidelines.

3.9.6.2 Alternative B

Impacts to Authorized Uses

Similar impacts to those discussed for the Proposed Action would result from Alternative B, but to a lesser degree due to the reduced acreage from elimination of the North Array. The

elimination of the North Array would reduce the Project's effect on the designated utility corridor, because on the northwest side of I-15, the solar plant would not occupy a 0.5-mile to 1-mile-wide portion of the corridor, and this alternative would leave an approximately 1.5-mile to 1.75-mile-wide area of the corridor that could accommodate several major utility lines in the future. The proposed substation would occupy a small area adjacent to the 500 kV line ROW and the collector lines would be located underground, such that overhead lines could be located over them within the corridor. Impacts from development of solar arrays on the southeast side of I-15 would be the same as for the Proposed Action.

Multiple-Use Classes

Because Alternative B would eliminate the North Array, it would reduce the amount of Class L land on which use opportunities would be restricted during the life of the Project. The impact of Alternative B on Class M and I lands would be the same as that of the Proposed Action. As described in the consistency analysis below in Section 3.9.10, the land use activities associated with Alternative B would be consistent with MUC Guidelines.

3.9.6.3 Alternative C

Impacts to Authorized Uses

The same impacts as discussed for the Proposed Action would result from Alternative C, but to a lesser degree due to reduced acreage of the solar arrays. The impact of Alternative C on the designated utility corridor would be similar to that of the Proposed Action because the configuration of the solar arrays under Alternative C would not increase the available width of the corridor relative to the Proposed Action.

Multiple-Use Classes

Because Alternative C would eliminate the East Array, it would reduce the amount of Class M and L lands on which use opportunities would be restricted during the life of the Project. The impact of Alternative C on Class I lands would be the same as that of the Proposed Action. As described in the consistency analysis below in Section 3.9.10, the land use activities associated with Alternative C would be consistent with MUC Guidelines.

3.9.6.4 Alternative D

Impacts to Authorized Uses

The same impacts as discussed for the Proposed Action would result from Alternative D, but to a lesser degree due to reduced acreage of the solar arrays. The impact of Alternative D on the designated utility corridor would be similar to that of the Proposed Action because the configuration of the solar arrays under Alternative D would not increase the available width of the corridor relative to the Proposed Action.

Multiple-Use Classes

Because Alternative D would reduce the size of the East and South arrays, it would reduce the amount of Class L, M, and I lands on which use opportunities would be restricted during the life of the Project. As described in the consistency analysis below in Section 3.9.10, the land use activities associated with Alternative D would be consistent with MUC Guidelines.

3.9.6.5 Alternative E: No Action/No Project

If the requested ROW grant is not authorized and the County does not issue the requested groundwater well permit authorization, the land within the requested ROW boundary would be available for additional utility lines and other potential land uses. There would be no impact to the designated corridor and no interference with other existing uses on-site and in the Project vicinity.

3.9.6.6 Alternative F: CEQA No Project

The impacts of this alternative would be the same as the Proposed Action because the omission of wells and importation of water from off-site sources would not alter the Project's effects on existing or potential land uses or multiple use classes.

3.9.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If the requested ROW grant is not authorized and the County does not issue the requested groundwater well permit authorization, the land within the requested ROW boundary would be available for additional utility lines and other potential land uses. The Land Use Plan Amendment, however, would make the area unavailable for any future solar development. There would be no impact to the designated corridors and no interference with other existing uses on-site and in the Project vicinity under this alternative.

3.9.7 Cumulative Effects

The geographic extent of cumulative impacts to lands and realty considerations would include the Project area and Section 368 designated utility corridor number 27-225. The geographic scope of the cumulative effects analysis for multiple-use classes includes all CDCA Plan area lands designated Class L, M, and I. The temporal scope includes the Project construction, operation and maintenance, and decommissioning periods.

The land uses associated within the Project site and surrounding area include undeveloped lands, recreation, mineral development, and use of designated utility corridors for oil and gas pipelines, electricity transmission and distribution lines, communication lines, and I-15. Major land uses within a 25-mile radius include the Mojave National Preserve and three military installations with restricted and controlled airspace used for training purposes. See Section 3.9.2, *Regional and Local Environmental Setting*.

As described above, direct and indirect impacts could result from the Project to authorized uses and to pending applications. Authorized uses are shown in Table 3.9-1. Additionally, as shown in Table 3.9-2, the BLM has two pending oil and gas pipeline applications and a pending application for an electric power line within an existing ROW. Reasonably foreseeable projects could include those shown in Tables 3.9-1 and 3.9-2, including several electric transmission lines, one or more oil and gas pipelines, and several fiber optic lines, depending on the order in which applications were filed. Among these are the XpressWest and Calnev Pipeline Expansion projects, described in Table 3.1-3 and shown in Figure 3.1-1.

Project impacts to authorized uses or pending applications could cause or contribute to a cumulative effect on lands and reality in combination with these other past, present, or reasonably foreseeable future actions if future projects were constrained by the placement of Project-related facilities within the Section 368 designated corridor, such that they were deemed infeasible or required to be located outside of the designated corridor due to the Project's location. If the Propose Action or Alternative C or D is implemented, the corridor would have a remaining width of approximately 0.9 mile in two 0.4-mile to 0.5-mile sections on the northwest side of I-15 as shown in Figure 3.9-1. Existing, authorized, and reasonably foreseeable projects within the corridor (listed in Tables 3.9-1 and 3.9-2) are estimated to occupy approximately 1,000 feet of the corridor northwest of I-15 (RMT, 2009, Table 2.2-1 and Figure 1.4-1), leaving approximately 3,700 feet of the designated corridor available for future use. This area could accommodate the equivalent of 10 new 500kV ROWs (at 330 feet in width), over 30 new oil or gas pipeline ROWs (at 100 feet in width), or numerous smaller utility ROWs such as fiber optic lines, or any combination of such uses that would fit within the remaining area of the corridor. Implementation of Alternative B would increase the available width of the corridor on the northwest side of I-15 by eliminating the North Array. Based on the historic rate of development within this corridor, it is unlikely that the corridor would become constrained such that future linear projects would be deemed infeasible or would be required to be located outside of the designated corridor within the Project's projected lifespan.

Regarding impacts on multiple use classes the existence of the Project would preclude the development of other uses on the site from the start of construction to the completion of decommissioning activities, and, thereby, would affect the type of use opportunities on Class L, M, and I lands within the CDCA Plan area. The effects of the Project on MUCs, as analyzed above, relate to the opportunity cost of implementing the Project. In other words, if the Project or an alternative is developed on the site, the site could not be used for other Class L, M, or I use opportunities, as applicable, that otherwise would be available on the site. Projects that also would be developed wholly or partially on lands designated as Class L, M, or I would similarly restrict available use opportunities within that classification for the duration of those projects. As shown in Table 3.1-2, approximately 180,148 acres of land in the California Desert District are proposed for development as renewable energy projects, assumed to be a combination of Class L, M, and I lands because such uses are not allowed on Class C lands. The Project would remove approximately 4,179 acres of a combination of Class L, M, and I lands from availability for other uses, representing approximately 2.3 percent of this total.

Within the CDCA Plan area, there are approximately 4 million acres of Class L lands, 1.5 million acres of Class M lands, and 500,000 acres of Class I lands. The Project in combination with other renewable energy projects would occupy only 3 percent of this area. Further, these lands would be available for other uses upon the completion of decommissioning activities.

3.9.8 Mitigation Measures

No mitigation measures are required.

3.9.9 Residual Effects

If the Project were approved, the land would remain encumbered with the Project facilities for the duration of the ROW grant and potentially for additional years if the grant were to be renewed. Residual effects would be the same as the effects described in Sections 3.9.6 and 3.9.7. If the Project were not approved, then the land would remain unencumbered except for the existing authorized uses and would be available for other uses.

3.9.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G Section X, a project would have a significant impact related to land use and planning if it would:

a) Physically divide an established community;

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or

c) Conflict with any applicable habitat conservation plan or natural community conservation plan.

3.9.10.1 Alternative A: Proposed Action

a) The Proposed Action would not physically divide an established community. (No Impact)

No established community exists within or adjacent to the Project site. Therefore, neither the Proposed Action nor any of the alternatives could physically divide one. Because the Proposed Action would have no impact with respect to this criterion, it would not cause or contribute to any cumulative impact related to the physical division of an established community.

b) The Proposed Action would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (No Impact)

The CDCA Plan's Multiple Use Class guidelines are the applicable land use policies for the Project site. As described in Section 3.9.11, below, the Proposed Action would not conflict with

these policies. No impact would occur, and the Proposed Action would not cause or contribute to a significant cumulative effect with regard to land use plans, policies, and regulations.

c) The Proposed Action would not conflict with any applicable habitat conservation plan or natural community conservation plan. (No Impact)

The Project site is not subject to any habitat conservation plan or natural community conservation plan. Therefore, the Proposed Action would have no impact related to criterion c. Because the Proposed Action would have no impact in this respect, it would not cause or contribute to any cumulative impact.

3.9.10.2 Alternative B

For the same reasons provided in Section 3.9.10.1 and further described in Section 3.9.11 with respect to the applicable land use plan, Alternative B would cause no impact relating to any of the significance criteria identified in Section 3.9.10, and so could not cause or contribute to a significant cumulative effect in this regard.

3.9.10.3 Alternative C

For the same reasons provided in Section 3.9.10.1 and further described in Section 3.9.11, Alternative C would cause no impact relating to any of the significance criteria identified in Section 3.9.10, and so could not cause or contribute to a significant cumulative effect in this regard.

3.9.10.4 Alternative D

For the same reasons provided in Section 3.9.10.1 and further described in Section 3.9.11, Alternative D would cause no impact relating to any of the significance criteria identified in Section 3.9.10, and so could not cause or contribute to a significant cumulative effect in this regard.

3.9.10.5 Alternative E: No Action/No Project

If Alternative E were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, this No Action/No Project Alternative would not result in any changes to land use and no impact resulting from a conflict with any applicable land use plan, policy, or regulation would occur, nor any contribution to a cumulative impact.

3.9.10.6 Alternative F: CEQA No Project

Alternative F would cause the same land use and planning-related impacts as the Proposed Action and Alternatives B, C, and D because regardless of which configuration were approved, solar project development would occur on the site, and so would commit the specified number of acres under each scenario to restricted use until decommissioning and site reclamation activities are

completed. The fact that Alternative F would result in a greater number of water delivery trucks visiting the Project site and traveling on area roadways during all phases of the Project would not affect consistency of the proposed solar energy generation use with the CDCA Plan. Therefore, like the Proposed Action, no impact would occur related to any of the significance criteria identified in Section 3.9.10 and so could not cause or contribute to a significant cumulative effect.

3.9.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G were implemented, no development would occur on the site and the existing environmental setting would be maintained. This alternative would not result in any changes to land use considerations, except that the ROW area would be identified as unsuitable for future solar development applications, and no impact resulting from a conflict with any applicable land use plan, policy, or regulation would occur, nor any contribution to a cumulative impact.

3.9.11 CDCA Plan Consistency

As described in Section 3.9.3.1, above, land uses that are not in conformance with the CDCA Plan would require a plan amendment. Because the proposed Project site is not expressly identified in the CDCA Plan as a solar energy generation site, a CDCA Plan amendment would be required to allow this use of the site.

The Project site is located in the CDCA planning area within Class L, M, and I lands. The total area of Class L lands within the ROW boundary would be approximately 2,108 acres (this includes the North Array and portions of the East and South arrays), Class M lands total 2,321 acres (this includes the substation, switchyard, operation and maintenance area, and portions of the East and South arrays), and Class I lands total 188 acres (includes a portion of the South Array).

The process for considering amendments to BLM land use plans is described in the agency's *Land Use Planning Handbook* (BLM, 2005). The general process for amending a BLM Land Use Plan is as follows:

1. The plan amendment process would be completed in compliance with FLPMA, NEPA, and all other relevant federal law, executive orders, and BLM management policies.
2. The plan amendment process would include an EIS to comply with NEPA.
3. Where existing planning decisions remain valid, those decisions may remain unchanged and would be incorporated into the new plan amendment.
4. The plan amendment would recognize valid existing rights.
5. Native American tribal consultations would be conducted in accordance with policy, and tribal concerns would be given due consideration.
6. Consultation with other agencies with jurisdiction would be conducted throughout the plan amendment process.

Details concerning the proposed amendment for the Project or an alternative are provided in Chapter 2, *Proposed Action and Alternatives*. This PA/EIS/EIR acts as the mechanism for satisfying NEPA requirements for the CDCA Plan Amendment process, and provides the analysis required to support a CDCA Plan Amendment to identify the proposed site as suitable or unsuitable for solar development within the Plan.

MUC designations govern the type and degree of land uses allowed within each of the MUCs present within the ROW boundary. All land use actions and resource-management activities on BLM-administered lands within a MUC delineation must meet the guidelines for that class. These guidelines are provided in Table 1, Multiple-Use Class Guidelines, of the CDCA Plan (BLM, 1999). The Class L, M, and I designations allow electric generation plants for solar facilities to be developed in accordance with federal, state, and local regulations after NEPA requirements are met. In Class L designations, the AO is directed to use judgment in allowing for consumptive uses by taking into consideration the sensitive natural and cultural values that might be degraded as a result.

The Proposed Action meets the MUC Guidelines as noted in the CDCA Plan for the resources listed below. See Table 3.9-3, *Multiple-Use Class L, M, and I Land Use and Resource Management Guidelines*. All action alternatives would be located on a combination of Class L, M, and I lands, though with a smaller footprint than the Proposed Action, and would also meet the MUC guidelines as described in the following subsections.

Alternative E would have no impact with respect to MUC Guidelines because it would result in no development on the site and no plan amendment. Implementation of Alternative F would have the same effects as Alternative A, B, C, or D, depending on the site layout approved, and is not addressed separately from these alternatives below. Because it would result in no development on the site and a plan amendment to identify the site as unsuitable for solar energy development, Alternative G would have no impact with respect to MUC Guidelines, with the exception of disallowing solar development within the area covered by the plan amendment.

3.9.11.1 Agriculture

Agricultural uses are not allowed on Class L, M, and I lands, with the exception of livestock grazing. Neither the Project nor any of the action alternatives would involve use of the site for agriculture.

3.9.11.2 Air Quality

Class L, M, and I lands are to be managed to protect air quality and visibility in accordance with Class II objectives of Title I, Part C of the Clean Air Act as amended. The anticipated maximum daily and annual construction emissions that would be associated with the Project are provided in Tables 3.2-5 and 3.2-6, respectively, of Section 3.2, *Air Resources*. The analysis indicates that daily construction emissions of NO_x, CO, and PM_{10} and annual construction emissions of NOx and PM_{10} would exceed the respective MDAQMD thresholds. Maximum annual construction emissions of NO_x would exceed the applicable federal *de minimis* threshold. Therefore, it can be

TABLE 3.9-3
MULTIPLE-USE CLASS L, M, AND I LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines	MUC M Guidelines	MUC I Guidelines
1. Agriculture	Agricultural uses (excluding livestock grazing) are not allowed.		
2. Air Quality	These areas will be managed to protect their air quality and visibility in accordance with Class II objectives of Part C of the Clean Air Act Amendments unless otherwise designated another class by the State of California as a result of recommendations developed by any BLM air-quality management plan.		
3. Water Quality	Areas designated in this class will be managed to provide for the protection and enhancement of surface and groundwater resources, except for instance of short-term degradation caused by water development projects. Best management practices, developed by the Bureau during the planning process outlined in the Clean Water Act, Section 208, and subsequently, will be used to keep impacts on water quality minimal and to comply with Executive Order 12088.	Areas designated in this class will be managed to minimize degradation of water resources. Best management practices, developed by the Bureau during the planning process outlined in the Clean Water Act, Section 208, and subsequently, will be used to keep impacts on water quality minimal and to comply with Executive Order 12088.	
4. Cultural and Paleontological Resources	Archaeological and paleontological values will be preserved and protected. Procedures described in 36 CFR 800 will be observed where applicable. A Memorandum of Agreement has been signed by the BLM, the California State Historic Preservation Officer, and for cultural resources the President's Advisory Council on Historic Preservation to protect cultural resources.		
5. Native American Values	Native American cultural and religious values will be preserved where relevant and protected where applicable. Native American group(s) shall be consulted. Memorandums of Agreement and Understandings have been signed between BLM and the Native American Heritage Commission pertaining to Native American concerns and cultural resources.		
6. Electrical Generation Facilities	Electrical generation plants may be allowed as shown below. Existing facilities may be maintained and upgraded or improved in accordance with special-use permits or by amendments to rights-of-way. a. Wind/Solar may be allowed after NEPA requirements are met. b. Geothermal may be allowed pursuant to licenses issued under 43 CFR Section 3250 et seq. NEPA requirements will be met.	In addition to allowable uses under MUC L guidelines, nuclear and fossil fuel power plants may be allowed in accordance with Federal, State and local laws.	
7. Transmission Facilities	New gas, electric, and water transmission facilities and cables for interstate communication may be allowed only within designated corridors (see Energy Production and Utility Corridors Element). NEPA requirements will be met. Existing facilities within designated corridors may be maintained and upgraded or improved in accordance with existing rights-of way grants or by amendments to right-of-way grants. Existing facilities outside designated corridors may only be maintained but not upgraded or improved.		
7a. Distribution Facilities	New distribution systems may be allowed and will be placed underground where feasible except where this would have a more detrimental effect on the environment than surface alignment. In addition, new distribution facilities shall be placed within existing ROW where they are reasonably available.	New distribution facilities may be allowed and shall be placed within existing rights-of-way where they are reasonably available. NEPA requirements will be met.	
	Existing facilities may be maintained and utilized in accordance with right-or-way grants and applicable regulations.		

TABLE 3.9-3 (Continued)
MULTIPLE-USE CLASS L, M, AND I LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines	MUC M Guidelines	MUC I Guidelines
8. Communication Sites	Existing facilities may be maintained and utilized in accordance with right-or-way grants and applicable regulations.		
9. Fire Management	Fire suppression measures will be taken in accordance with specific fire management plans subject to such conditions as the authorized officer deems necessary, such as use of motorized vehicle, aircraft, and fire retardant chemicals.		
10. Vegetation Harvesting	Removal of vegetation, commercial or non-commercial, may be allowed by permit only after NEPA requirements are met and after development of necessary stipulation. Harvesting by mechanical means may be allowed by permit only. All state and federally listed species will be fully protected. Actions which may jeopardize the continued existence of federally listed species will require consultation with the U.S. Fish and Wildlife Service. Identified sensitive species will be given protection in management decisions consistent with BLM policies. Identified UPAs will be considered when conducting all site-specific environmental impact analyzes to minimize impact. See also Wetland/Riparian Areas guidelines.		
Vegetation Manipulation	Aerial broadcasting application of chemical controls will not be allowed. Exclosures may be allowed. Prescribed burning may be allowed after development of a site-specific management plan.		
	Mechanical control will not be allowed. Chemical noxious weed eradication may be allowed after site-specific planning. Types and uses of pesticides, in particular herbicides must conform to Federal, State and local regulations.	Mechanical control may be allowed, but only after consideration of possible impacts. Spot application of chemical control will be allowed after site-specific planning. Types and uses of pesticides, in particular herbicides, must conform to Federal, State, and local regulations.	
11. Land-Tenure Adjustment	Public land will not be sold.	Sale of public land may be allowed in accordance with FLPMA and other applicable Federal laws and regulations. Sales in WSAs will not be allowed until after Congressional action.	Public land will not be sold.
12. Livestock Grazing	Grazing will be allowed subject to the protection of sensitive resources.		
	Support facilities such as corrals, loading chutes, water developments, and other facilities, permanent or temporary, may be allowed consistent with protection of sensitive resources. Manipulation of vegetation by chemical or mechanical means will not be allowed, except for site-specific needs.	Support facilities such as corrals, loading chutes, water developments, and other facilities, permanent or temporary, will be allowed. Manipulation of vegetation by chemical or mechanical means may be allowed and may be designed, developed, and managed for intensive livestock use.	
13. Mineral Exploration and Development	Except as provided in Appendix 5.4, 516, DM 6, NEPA procedures titled “Categorical Exclusions”, prior to approving any lease, notice, or application that was filed pursuant to 43 CFR 3045, 3100, 3200, 3500 and S.O. 3087, as amended, an EA will be prepared on the proposed action. Mitigation and reclamation measures will be required to protect and rehabilitate sensitive scenic, ecological, wildlife vegetative and cultural values.		

TABLE 3.9-3 (Continued)
MULTIPLE-USE CLASS L, M, AND I LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines	MUC M Guidelines	MUC I Guidelines
13. Mineral Exploration and Development (cont.)	Location of mining claims is nondiscretionary. Operations on mining claims are subject to the 43 CFR 3809 Regulations and applicable State and local law. NEPA requirements will be met. BLM will review plans of operations for potential impacts on sensitive resources identified on lands in this class. Mitigation, subject to technical and economic feasibility, will be required. Except as provided in Appendix 5.4, 516 DM 6, NEPA Procedures titled "Categorical Exclusions", new material sales locations, including sand and gravel sites, will require an EA. Continued use of existing areas of sand and gravel extractions is allowed subject to BLM permits as specified in 43 CFR 3600.		
14. Motorized-Vehicle Access/ Transportation	New roads and ways may be developed under ROW grants or pursuant to regulations or approved plans of operation.	Motorized-vehicle use will be allowed on existing routes of travel unless closed or limited by the authorized officer. New routes may be allowed upon approval of the authorized officer.	Same as Class M. In addition, the vehicle open areas are available for unrestricted vehicle access except where private land, ACECs and active mining areas are included
	Vehicle use on some significant dunes and dry lakebeds may be is allowed (see Motorized Vehicle Access Element). Periodic or seasonal closures or limitations of routes of travel may be required. Access will be provided for mineral exploration and development,		
	Railroads and trams may be allowed to serve authorized uses if no other visible alternative is possible. Temporary landing strips may be allowed by permit.	Railroads and trams may be allowed. Airports and landing strips may be allowed by lease subject to conformance with county or regional airport loans and FAA and DOD approval.	
15. Recreation	This class is suitable for recreation which generally involved low to moderate user densities. Recreation opportunities include those permitted in Class C: a. land-sailing on dry lakes b. non-competitive vehicle touring and events only on "approved" routes of travel All organized vehicle events, competitive or not, require a permit specifying the condition of use. These conditions will include, but are not limited to: a. approved routes b. no pitting, start, finish or spectator areas	This class is suitable for a wide range of recreation activities which may involve moderate to high user densities. Recreational opportunities include those permitted in Class L. Competitive motorized vehicle events are limited to "existing" routes of travel and must be approved by the authorized officer. Pit, start, and finish areas must be designated by the authorized officer. All competitive events and organized events having 50 or more vehicles require permits.	This class is suitable for recreation activities which generally involve high user densities. A wide array of recreational opportunities will be found in this class. Off-road-vehicle play will be allowed where approved in open areas. Uses permitted are the same as Class M; in addition, motorized-vehicle play is allowed in areas designated "open". All aspects of competitive events will be permitted except where specific mitigations are stipulated by the authorized officer.
	Permanent or temporary facilities for resource protection and public health and safety are allowed. Trails are open for non-vehicle use and new trails for non-motorized access may be allowed.		
16. Waste Disposal	Hazardous waste disposal sites will not be allowed. New non-hazardous waste disposal sites will not be allowed.	Public lands managed by BLM may not be used for hazardous or non-hazardous waste disposal. Where locations suitable for such disposal are found on BLM managed lands, consideration will be given to transfer of such sites to other ownership for this use. This amendment applies to waste normally handled through landfills or other waste management facilities. It does not apply to mining waste, including tailings and/or chemicals used in processing ore.	

TABLE 3.9-3 (Continued)
MULTIPLE-USE CLASS L, M, AND I LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines	MUC M Guidelines	MUC I Guidelines
17. Wildlife Species and Habitat	All State and federal listed species and their critical habitat will be fully protected. Actions which may affect or jeopardize the continued existence of federally listed species will require formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act. Identified species will be given protection in management decisions consistent with BLM policies. Control of depredation wildlife and pests will be allowed in accordance with existing State and Federal laws. Projects to improve wildlife habitat may be allowed subject to environmental assessment. Reintroduction or introduction of native species or established exotic species is allowed.		
18. Wetland-Riparian Areas	Wetland/riparian areas will be considered in all proposed land-use actions. Steps will be taken to provide that these unique characteristics and ecological requirements are managed in accordance with Executive Order 11990, Protection of Wetlands (42 CFR 26951), legislative and Secretarial direction, and BLM Manual 6740, “Wetland Riparian Area Protection and Management.” as outlined in the Vegetation Element.		
19. Wild Horses and Burros	Populations of wild and free-roaming horses and burros will be maintained in healthy, stable herds, in accordance with the Wild and Free-Roaming Horse and Burro Act of 1971 but will be subject to controls to protect sensitive resources.		

concluded that Project construction could result in or contribute to a short-term exceedance of the federal AAQS for ozone. The maximum daily and annual operation emissions that would be associated with the Project are provided in Tables 3.2-7 and 3.2-8. Annual operation emissions are anticipated to be well under the general conformity *de minimis* thresholds. The magnitude of the impacts of decommissioning emissions are expected to be significantly less than those estimated for Project construction since decommissioning would occur after at least 30 years of operation, and it is expected that on-road and off-road equipment engine technology would be far more advanced and cleaner than is currently the case. Because any exceedance of applicable thresholds would be temporary and emissions would disperse from the Project site rapidly, the Proposed Action would conform to the Clean Air Act Class II objectives referenced in the CDCA Plan MUC guidelines.

As described in Section 3.2, *Air Resources*, maximum daily construction emissions associated with Alternatives B, C, and D are anticipated to be approximately the same as for the Proposed Action. The estimated annual construction emissions for Alternatives B, C, and D are provided in Tables 3.2-10, 3.2-12, and 3.2-14, respectively. For the reasons described above, Alternatives B, C, and D would conform to the Clean Air Act Class II objectives referenced in the CDCA Plan MUC guidelines.

3.9.11.3 Water Quality

The CDCA Plan states that Class L lands are to be managed "to provide for the protection and enhancement of surface and groundwater resources," and Class M and I lands must be managed to minimize degradation of water resources, using the BLM's BMPs prepared in compliance with the CWA Section 208 and Executive Order 12088, both of which address federal compliance with pollution control standards (BLM, 1999, p. 15). The BMPs that are relevant to the Project would be applied as part of APMs 14 through 18 described in Chapter 2, and Mitigation Measure 3.19-2 (Comprehensive Drainage, Stormwater, and Sedimentation Control Plan) described in Section 3.19, *Water Resources*. With implementation of these surface and groundwater quality BMPs, impacts to water resources and water quality would be reduced, and the Proposed Action would conform to the CDCA Plan guidelines for Class L, M, and I lands.

As described in Section 3.19, the potential for degradation of surface and groundwater resources associated with Alternatives B, C, and D would be reduced compared to Proposed Action because these alternatives would result in less ground disturbance that could result in surface water quality degradation and less groundwater consumption, in approximate proportion to their reduced sizes. Additionally, the same BMPs that would be implemented for the Proposed Action also would be implemented for Alternatives B, C, and D. Therefore, construction and operation of Alternative B, C, or D would have the same effects with respect to conformance with the CDCA Plan as the Proposed Action.

3.9.11.4 Cultural and Paleontological Resources

Cultural and paleontological resources are to be preserved and protected within Class L, M, and I lands, and procedures described in 36 CFR Section 800 are to be observed where applicable. As

described in detail in Sections 3.6, *Cultural Resources*, and 3.12, *Paleontological Resources*, impacts on cultural and paleontological resources resulting from the construction, operation and maintenance, and decommissioning of the Proposed Action would be mitigated and would conform to the MUC Guidelines. Adverse effects on cultural resources listed on or determined eligible for the NRHP would be resolved in accordance with NHPA Section 106 as described in Mitigation Measure 3.6-2.

As described in Sections 3.6 and 3.12, the potential for impacts on cultural and paleontological resources resulting from the construction, operation, maintenance, and decommissioning of Alternatives B, C, and D would be reduced compared to Proposed Action because these alternatives would result in less ground disturbance that could result in damage to or destruction of cultural and paleontological resources due to their reduced sizes. Additionally, the same mitigation measures that would be implemented for the Proposed Action also would be implemented for Alternatives B, C, and D. Therefore, construction and operation of Alternative B, C, or D would have the same effects with respect to conformance with the CDCA Plan as the Proposed Action.

3.9.11.5 Native American Values

Under the MUC Guidelines, Native American cultural and religious values are to be protected and preserved and the appropriate Indian tribes are to be consulted on all lands within the CDCA. Consultation with Indian tribes was initiated during the planning phase of the Project and will continue during the NEPA process (Section 3.6, *Cultural Resources*, and Chapter 4, *Consultation, Coordination, and Public Involvement*, describe the Native American consultation processes). Opportunities have been provided to allow Indian tribes to identify places and resources of importance to them and to express concerns regarding cultural and religious values that could be affected by the Proposed Action.

Adverse effects on any places of traditional cultural or religious importance that are identified by tribes would be resolved in accordance with NHPA Section 106 as described in Mitigation Measure 3.6-2. Potential impacts to and protection of cultural resources are discussed in more detail in Section 3.6, *Cultural Resources*. Collectively, these measures ensure that preservation and protection of Native American cultural and religious values associated with cultural resources is accomplished in accordance with the CDCA Plan MUC Guidelines. The same consultations and mitigations have been and would be implemented in association with Alternatives B, C, and D.

3.9.11.6 Electrical Generation Facilities

Solar generation may be allowed on Class L, M, and I lands after NEPA requirements are met. This PA/EIS/EIR represents the mechanism for complying with the NEPA requirements for the solar generation that would be developed under the Proposed Action or Alternative B, C, or D.

3.9.11.7 Transmission and Distribution Facilities

Class L, M, and I guidelines allow electric transmission to occur in designated ROW corridors. The Proposed Action and alternatives would require an interconnection with the existing LADWP

500 kV line, and this interconnection would be within the designated corridor that runs through the valley in which the Project would be located (see Figure 3.9-1). The Proposed Action and alternatives do not propose distribution facilities and therefore would not be affected by the MUC guidelines for this activity.

3.9.11.8 Communication Sites

Communication sites may be allowed on Class L, M, and I lands after NEPA requirements are met. The Proposed Action and alternatives would not involve installation of communications sites and therefore would not be affected by the MUC guidelines for this land use activity.

3.9.11.9 Fire Management

The Project site is located in a federal responsibility area (FRA) under the jurisdiction of the BLM, and the site is within a moderate fire hazard severity zone (FHSZ). As described in Section 3.20, *Wildland Fire Ecology*, Mitigation Measure 3.20-1 requires the Applicant to prepare and implement a Fire Safety Plan in consultation with the BLM to reduce the risk of fire and to train personnel to respond to fires on site. Fires would be addressed in conformance with the Fire Safety Plan and, therefore, would conform to the MUC guidelines for Fire Management for Class L, M, and I lands.

As described in Section 3.20, the potential for impacts related to the risk of wildland fire resulting from the construction, operation, maintenance, and decommissioning of Alternatives B, C, and D would be reduced compared to Proposed Action because these alternatives would result in reduced vehicle and worker activity on the site in proportion to the smaller size of the solar plant under each alternative. Additionally, Mitigation Measure 3.20-1 also would be implemented for Alternatives B, C, and D. Therefore, Alternative B, C, or D would have the same effects with respect to conformance with the CDCA Plan as the Proposed Action.

3.9.11.10 Vegetation

Table 1 of the CDCA Plan includes a variety of guidelines associated with vegetation as follows:

Vegetation Harvesting

Native Plants. Commercial or non-commercial removal of native plants in Class L, M, and I areas may be allowed only by permit after NEPA requirements are met, and after development of necessary stipulation. Approval of a ROW grant for the Project would constitute the permit for such removal. The conditions of approval that would be required in a Record of Decision would constitute the stipulations to avoid or minimize impacts from removal of native plants.

Harvesting by mechanical means. Harvesting by mechanical means may be allowed by permit only. The Proposed Action and alternatives do not propose vegetation harvesting, and would be in conformance with this MUC guideline.

Rare, Threatened, and Endangered Species, State and Federal. In all MUC areas, all federal and state-listed species are to be fully protected. In addition, actions that may jeopardize the continued existence of federally listed species will require consultation with the USFWS. As evaluated in Section 3.3, *Biological Resources – Vegetation*, no federal or state-listed plants would be affected by the Proposed Action or alternatives.

Sensitive Plant Species. Identified sensitive plant species would be given protection in management decisions consistent with the BLM's policy for sensitive species management, BLM Manual 6840 (BLM, 2008). The objective of this policy is to conserve and/or recover listed species, and to initiate conservation measures to reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing. The Proposed Action and alternatives are not anticipated to affect special-status plant species. Impacts and mitigation measures associated with special-status plant species are discussed in Section 3.3, *Biological Resources - Vegetation*. Because these measures are intended to reduce threats to any potentially present species, these measures are in conformance with the MUC guidance in the CDCA Plan.

Unusual Plant Assemblages. No unusual plant assemblages have been identified on the Project site.

Vegetation Manipulation

Vegetation manipulation is defined in the CDCA Plan as removing noxious or poisonous plants from rangelands; increasing forage production; creating open areas within dense brush communities to favor certain wildlife species; or eliminating introduced plant species.

Mechanical Control. Mechanical control (e.g., mowing) is not allowed on Class L lands (which occur on the Project site under the Proposed Action and Alternatives B, C, and D), but may be allowed on Class M and I lands after consideration of possible impacts. The use of mowing on Class L lands would not be in conformance with the MUC guidelines for that designation. As described in the Applicant's draft Integrated Weed Management Plan (IWMP) (Appendix E-2, p. 6-12), mowing would not be used on the Project site. During the construction, operation, maintenance, and decommissioning phases, the Applicant would abide by weed control procedures as developed in cooperation with the BLM. The establishment of noxious/invasive vegetation can be limited by early detection and eradication. The Applicant would finalize the site-specific IWMP, described in Section 3.3.5, in compliance with Mitigation Measure 3.3-2, and circulate it to the BLM for review and approval by the Authorized Officer prior to a ROW grant being issued. Such actions would be conducted as part of the Proposed Action and all alternatives. Vegetation management under this plan would conform to federal, state, and local regulations, and the BLM Authorized Officer would ensure that the plan conforms to CDCA Plan guidelines for Class L, M, and I lands as applicable.

Chemical Control. Aerial broadcasting application of chemical controls is not allowed on Class L, M, or I lands and is not proposed as part of the Proposed Action or alternatives. Noxious weed eradication may be allowed on Class L lands, and spot application on Class M and I lands, after site-specific planning. Each action alternative would involve the use of Class L, M, and I lands

(see Figure 1-2). As described in Section 3.3.5, prior to beginning construction on the Project, the Applicant would finalize and implement the site-specific IWMP that meets the approval of BLM's Authorized Officer to prevent the spread of existing invasive species and the introduction of new invasive species to the Project Area (the Applicant's draft IWMP is included as Appendix E-2). The IWMP would address monitoring, education of operation and maintenance personnel on weed identification, the manner in which weeds spread, use of any pesticides, and methods for treating infestations. Vegetation would be managed with a BLM-approved herbicide in accordance with guidance provided in the BLM Programmatic EIS for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM, 2007).

The Applicant's proposed herbicide types and uses are described in detail in the draft IWMP. As part of IWMP implementation, the Applicant proposes to submit pesticide use proposals (PUP) to the BLM Barstow Field Office prior to application of any pesticides or herbicides on BLM lands. Following use of herbicides, the Applicant would submit pesticide application records to this office within 24 hours. Pesticide use would be limited to non-persistent, immobile pesticides applied only in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Any pesticide applications would be conducted within the framework of BLM and DOI policies, and would entail only the use of USEPA registered pesticides. The Applicant and its contractors would follow the BLM's Herbicide Use Standard Operating Procedures provided in Appendix B of the Record of Decision for the Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (BLM, 2007). Personnel responsible for weed control would be trained in the proper and safe use of all equipment and chemicals used for weed control.

Exclosures. The Project would not include exclosures.

Prescribed Burning. The Project would not include prescribed burning.

3.9.11.11 Land Tenure Adjustment

Neither the Proposed Action nor any of the alternatives would involve the sale of any BLM-administered lands.

3.9.11.12 Livestock Grazing

Neither the Proposed Action nor any of the alternatives would involve livestock grazing.

3.9.11.13 Minerals

Neither the Proposed Action nor any of the alternatives propose mineral exploration or development.

3.9.11.14 Motorized Vehicle Access/Transportation

Both the Applicant's proposed Rasor Road realignment route and the Alternative B realignment route would be located on Class M and I lands. Pursuant to the CDCA MUC guidelines for Class

M and I areas, new routes may be developed upon approval of the authorized officer. Approval of the ROW grant would represent such approval for development of a new portion of Rasor Road.

3.9.11.15 Recreation

Neither the Proposed Action nor any of the alternatives would involve use of the Project site for recreational uses and therefore would have no effect with respect to conformance with allowable recreational uses on the site. An analysis of the impacts of the Proposed Action and alternatives on existing recreational use of the site is provided in Section 3.13, *Recreation*.

3.9.11.16 Waste Disposal

Neither the Proposed Action nor any of the alternatives would involve the development of waste disposal sites.

3.9.11.17 Wildlife Species and Habitat

Table 1 of the CDCA Plan includes a variety of guidelines associated with wildlife as follows:

Rare, Threatened, and Endangered Species, State and Federal

As evaluated in Section 3.4, *Biological Resources - Wildlife*, the desert tortoise is the only state- and/or federally listed species potentially affected by the Proposed Action or alternatives. Mitigation measures developed as part of the Project would avoid, minimize, and/or compensate for potential effects to desert tortoise. As specified in the guidelines, the BLM will initiate formal consultation with the USFWS in accordance with Section 7 of the Endangered Species Act. The BLM has worked with USFWS, CDFW, and the Applicant to develop protection and compensation measures for the desert tortoise. Therefore, the Proposed Action and alternatives would comply with the guideline to provide full protection to the species.

Sensitive Species

Several BLM-sensitive wildlife species present or likely to occur on habitat associated with the Proposed Action and alternatives include, but are not limited to Mojave fringe-toed lizard, bighorn sheep, golden eagle, and migratory birds and bats. Those species that are likely to occur on the Project site would be protected under a number of mitigation measures meant to avoid, minimize, or compensate for impacts from the Project as discussed in detail in Section 3.4, *Biological Resources - Wildlife*.

Predator and Pest Control

As part of the Proposed Action and alternatives, the Applicant would dispose of trash in covered containers and regularly remove it from the site during all Project phases to reduce the likelihood that litter would attract predators (e.g., common raven) to the area and consequently increase the likelihood of predation on special status species (e.g., desert tortoise). All predator and pest

control would be implemented in conformance with state and federal laws and would be consistent with the MUC guidelines.

Habitat Manipulation

Neither the Proposed Action nor any of the alternatives would include habitat manipulation.

Reintroduction or Introduction of Established Exotic Species

Neither the Proposed Action nor any of the alternatives would include the reintroduction or introduction of exotic species.

3.9.11.18 Wetland/Riparian Areas

No wetlands or riparian areas are present on the Project site.

3.9.11.19 Wild Horses and Burros

No wild and free-roaming horses or burros are present on the Project site.

References

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.aa6ec747.File.pdf/CA_Desert_.pdf]

BLM, 2005. BLM Manual; Land Use Planning Handbook H-1601, [http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/planning/planning_general.Par.65225.File.dat/blm_lup_handbook.pdf]

BLM, 2007. Programmatic EIS for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States. [http://www.blm.gov/wo/st/en/prog/more/veg_eis.html]

BLM, 2008. West-wide Energy Corridor Programmatic Environmental Impact Statement Final Map (November). [http://corridoreis.anl.gov/documents/fpeis/maps/Section368Corridors_Nov2008_Poster.pdf]

BLM, 2009. Approved Resource Management Plan/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States (January). [http://corridoreis.anl.gov/documents/docs/Energy_Corridors_final_signed_ROD_1_14_2009.pdf]

RMT, Inc., 2009. Soda Mountain Utility Corridor Constraints Evaluation, Soda Mountain Solar Project, San Bernardino County, CA (November).

San Bernardino County, 2007. County of San Bernardino 2007 General Plan, as amended.

Soda Mountain Solar, LLC, 2013. SF-299 and Appendices.

This page intentionally left blank

3.10 Mineral Resources

3.10.1 Introduction

This section presents a discussion of mineral resources relevant to the Proposed Action and alternatives. Baseline geologic and mineral resources information was collected from the BLM, the U.S. Geological Survey (USGS), the California Department of Conservation (CDOC), San Bernardino County, and from the Applicant's technical reports (RMT, Inc., 2009, 2011; Wilson Geosciences, 2011). The study area for the purpose of assessing direct effects on mineral resources includes lands within the requested ROW boundary for the Project because, if the Project or an alternative is approved, then the area would be unavailable for mineral exploration and/or extraction until decommissioning and site reclamation activities are complete. The study area for indirect effects includes lands where future mineral resource exploration or extraction would be precluded by Project activities.

3.10.2 Regional and Local Environmental Setting

The vast majority of the Project site is underlain by Quaternary age alluvium, primarily composed of alluvial fan deposits. These deposits consist of loose sedimentary material that has been shed primarily from the Soda Mountains over the course of the Quaternary period (up to 1.6 million years ago). A small portion of the southern part of the Project site is underlain by Tertiary age volcanic bedrock. Figure 3.7-1 illustrates the geologic units underlying the Project site.

The BLM groups minerals on federal lands into three distinct categories: (1) locatable resources (subject to the General Mining Law of 1872, as amended); (2) leasable resources (subject to various Mineral Leasing Acts); and (3) saleable resources (subject to mineral materials disposed of under the Materials Act of 1947, as amended) (BLM, 2011a). Locatable minerals include hardrock resources that are typically metals, such as gold, silver, copper, uranium, and some industrial minerals such as gypsum, chemical and cement grade limestone, high grade silica and others. Leasable minerals include those which are typically found in bedded deposits, such as oil, gas, coal, and geothermal resources, as well as non-energy leasable minerals including sodium, potassium, and phosphate. Saleable minerals include common variety of materials such as sand, stone, and gravel (BLM, 2011a). The BLM's Legacy Rehost System (LR2000) (BLM, 2013) provides reports on BLM-administered land and mineral use authorizations for oil, gas, and geothermal leasing, rights of ways, coal and other mineral development, land and mineral title, mining claims, withdrawals, classifications, and more on federal lands or on federal mineral estate; a LR2000 report was generated for the Project site and findings are discussed below.

Most of the geologic units underlying the Project site are potential sources of sand and gravel that could have value as a mineral resource commodity.

3.10.2.1 Locatable Minerals

The BLM's LR2000 report showed that mining claims could occur within the Project site, and the Utility Corridor Constraints Evaluation prepared by the Applicant's consultant (RMT, Inc., 2009) showed that mines and/or active mining claims occur near to the Project site. However, all identified mines and mining claims are outside of the requested ROW boundary, and the Project has been designed to avoid all known mining claims and not preclude access to or interfere with these claims.

Non-metallic and metallic mineral deposits occur in proximity to the Project site; however, no active mining of metallic deposits was identified within 1,000 feet of the site boundary (Wilson Geosciences, 2011). Metallic deposit mining activity in the Soda Mountains around the Project site has included gold, silver, and lead, while non-metallic deposit mines in the surrounding area include quartz and bentonite (Wilson Geosciences, 2011). As depicted in the corridor study (RMT, Inc., 2009), the closest, active mining claim is just northeast of the Project site, on the northeast side of Blue Bell Mine Road, although, no active mining occurs at this site (RMT, Inc., 2011).

There is a bedrock quarry area adjacent to the southeast corner of the Project site in the vicinity of the proposed operation and maintenance buildings area, though it is not noted in official records (Wilson Geosciences, 2011). Other areas of the volcanic bedrock and overlying alluvium material north and west of the quarry also appear to have been excavated. Based on the geological environment and historical trends, the potential for occurrence of locatable minerals within the Project site is very low.

3.10.2.2 Leasable Minerals

The BLM's LR2000 report did not identify any leasable minerals within the boundary of the requested ROW. Further, the CDOC indicates that there are no oil, gas, or geothermal resources present within the vicinity of the site (CDOC, 2001). This is likely due to the lack of sedimentary bedrock formations within the Project site and surrounding area.

3.10.2.3 Saleable Minerals / Mineral Materials

The BLM's LR2000 report did not identify any saleable mineral material sites (and no saleable mineral materials permits) within the boundary of the requested ROW. However, sand and gravel deposits are ubiquitous throughout the Quaternary geologic deposits in the vicinity of the Project site and the region. Thus, potential non-metallic deposits in the immediate vicinity of the Project site include sand and gravel.

A Caltrans mineral materials site (the Opah Ditch pit mine) is located to the northwest of I-15 on BLM-administered land adjacent to the northwest edge of the Project site. Caltrans has an active right to extract aggregate from an area west of the existing electrical transmission lines, and plans to expand this operation (RMT, Inc., 2011).[1] The boundary of the requested ROW avoids the

[1] The Opah Ditch pit mine may not be a saleable minerals permit, but a Title 23 Material Site Right-of-Way for highway purposes (23 USC §317), which is not within the authority of the Mineral Materials Act of 1947. The permitting process is typically a Lands action. In any case, Caltrans has rights to the material.

proposed expansion footprint of the Opah Ditch pit mine. The Caltrans access road to the Opah Ditch pit mine runs adjacent to the Project site boundary northwest of I-15.

The pit at the Opah Ditch pit mine was developed and excavated for aggregate from the mid 1970s through the mid 1980s and then reclaimed shortly thereafter. Partly due to poor vegetation establishment upon reclamation, the BLM has denied subsequent requests by Caltrans to extract additional aggregate and fill material from the Opah Ditch pit mine (Wilson Geosciences, 2011). Caltrans has filed an application with the BLM to expand the extraction area.

3.10.3 Applicable Laws, Regulations, Plans, and Standards

3.10.3.1 Federal

A variety of laws and regulations apply to mining on federal lands based on the presence of the three categories of minerals identified in Section 3.10.2. Locatable minerals are subject to the General Mining Law of 1872, as amended; leasable minerals are subject to the various leasing acts; and salable minerals are subject to the Mineral Materials Act of 1947, as amended (BLM, 2011a), and the Surface Use and Occupancy Act of 1955.

General Mining Law of 1872

The General Mining Law of 1872 (30 USC §§22-42), as amended, governs the rights of a mining claimant to locatable minerals on federal land. As noted in Section 3.10.2.1, the presence of locatable minerals within the requested ROW boundary is very unlikely; thus the potential applicability of this law to the Project is low.

Mineral Leasing Act of 1920

The Mineral Leasing Act of 1920 (30 USC §181 et. seq.) was created to promote the mining of leasable solid and fluid minerals, such as coal and oil, on public lands. Under this act, land is leased from the federal government during mineral resource exploration and development. The BLM's LR2000 report did not identify any leasable minerals on the Project site, so this law isn't applicable to the Project.

Mineral Leasing Act for Acquired Lands of 1947

This act (30 USC §§351-359) extends the mineral leasing laws enacted both before and after 1947 to nearly all lands acquired by the federal government. While the land within the requested ROW boundary does not fall into any of the categories of acquired federal land that are excluded from this law, the potential applicability of this act to the Project is low because no leasable minerals have been identified on the site.

Geothermal Steam Act of 1970

The Geothermal Steam Act of 1970 (30 USC §1001 et seq.) authorizes the Secretary of the Interior to lease geothermal steam and other geothermal resources, and defines rules governing how geothermal leasing is to occur. It also permits the Secretary to prescribe rules and regulations

as needed to carry out leases. The Project is not proposed to be located in a known geothermal resource area, and therefore the Project site is not likely to be leased for geothermal resource use.

Mineral Materials Act of 1947, as amended

This act (30 USC §601 et seq.) authorizes the BLM to sell mineral materials at fair market value and to grant free-use permits to government agencies and non-profit organizations, provided the disposal (i.e., removal) of such material is not prohibited by law or detrimental to the public interest. The disposition of mineral materials from public lands must comply with the applicable land use plan and all applicable federal laws (BLM, 2011b). The Project is proposed on and surrounded by land containing geologic deposits consisting of sand and gravel, which are considered mineral materials under this act.

National Materials and Minerals Policy, Research, and Development Act of 1980

National policies concerning materials identification, materials supply and demand management, and materials research and development are described in the National Materials and Minerals Policy, Research, and Development Act of 1980. “Materials” in this policy means substances, including minerals, that currently are used or potentially could be used in the future to supply the industrial, military, and essential civilian needs of the United States. Materials found on the Project site and in the Project vicinity could qualify.

CDCA Plan

Mineral exploration and development is governed by the same CDCA Plan guidelines on all Multiple-Use Classes within the Project site (see Table 3.9-3 in Section 3.9, *Lands and Realty*). For leasable minerals development, mitigation and reclamation measures are required to protect and rehabilitate sensitive scenic, ecological, wildlife, vegetative, and cultural values. For locatable minerals, operations on federal mining claims are subject to 43 CFR Subpart 3809 (regarding surface management) as well as NEPA. The BLM reviews plans of mining operations for potential impacts on sensitive resources within each Multiple-Use Class affected, and requires mitigation as appropriate. For saleable minerals, new material sales locations including sand and gravel sites require compliance with NEPA (BLM, 1999).

Federal Mineral Regulations

Federal regulations govern the management and use of mineral resources, including oil and gas resources (43 CFR Part 3100), geothermal resources (43 CFR Part 3200), coal (43 CFR Part 3400), and solid minerals other than coal and oil shale (43 CFR Parts 3500 and 3800). The potential applicability of these regulations to the Project site and surrounding area is low because leasable minerals are not known to occur within the requested ROW boundary.

Saleable minerals do occur in the vicinity area of the Project site. Regulations in 43 CFR Part 3600 govern the use of saleable minerals (also called mineral materials). The Proposed Action is proposed in areas designated Class L, M, and I (as described in the CDCA Plan). Lands

classified as L, M, or I are not excluded from disposal of mineral materials. Therefore, mineral materials in the Project area could be used by the Applicant or disposed of by the BLM, in which cases these regulations would apply.

3.10.3.2 State

State Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) (Pub. Res. Code §2710 et seq.) was enacted by the California Legislature to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property and the environment. Pursuant to its provisions, the State Mining and Geology Board (SMGB) receives classification information from the State Geologist, and then prioritizes and designates lands containing mineral deposits of regional or statewide significance. Areas which are generally given highest priority are those areas within the state which are subject to urban expansion or other irreversible land uses which would preclude mineral extraction. Mineral lands are mapped according to jurisdictional boundaries (i.e., counties), mapping all mineral commodities at one time in the area, using the California Mineral Land Classification System. (CDOC, 2000)

No Mineral Resource Zones have been identified within the Project site, nor has the Project site been mapped or classified with respect to the availability of aggregate resources (CDOC, 2000).

3.10.3.3 Local

San Bernardino County General Plan

The following policies identified in the Land Use (LU) and Conservation (CO) elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

> ***Policy CO 7.1*:** In areas containing valuable mineral resources, establish and implement conditions, criteria, and standards that are designed to protect the access to, and economic use of, these resources, provided that the mineral extraction does not result in significant adverse environmental effects and that open space uses have been considered for the area once mining operations cease.
>
> ***Policy CO 7.5*:** Protect existing mining access routes by giving them priority over proposed alterations to the land, or by accommodating the mining operations with as good or better alternate access, provided the alternate access does not adversely impact proposed open space areas or trail alignment.

3.10.4 Analytical Methodology

Impacts of the Proposed Action and alternatives on mineral resources were assessed based on the degree to which the Project would reduce the availability of mineral resource areas identified within the study area. As described in Section 3.10.2, the type and extent of mineral resources present in the study area was determined using applicable geologic maps and mineral resource

databases. A Project-specific Geologic Characterization Report prepared for the Applicant also provided information about mineral resources near the Project site (Wilson Geosciences, 2011). Construction, operation, maintenance, and decommissioning activities for the Project and alternatives are analyzed in terms of their potential direct, indirect and cumulative effects on existing mineral leases and mining claims and the future availability of or access to areas known to contain mineral resources.

3.10.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address mineral resources.

3.10.6 Direct and Indirect Effects

3.10.6.1 Alternative A: Proposed Action

Construction and Operation and Maintenance

Although construction and operation and maintenance activities could preclude aggregate material exploration and production on the Project site, similar mineral resources (e.g., alluvium comprised primarily of coarse sands and gravel) are widely available just outside of the Project site based upon similar lithology. Furthermore, deposits of similar general lithology (i.e., Quaternary alluvium) underlie roughly half of eastern San Bernardino County (CGS, 2010). Neither the SMGB nor San Bernardino County officially has designated the area as an aggregate resource area or mineral deposit of statewide or regional significance.

Development of the Project site would not interfere with any active mining operations, and would not constitute a substantial impact on regionally or locally important mineral resources. As the only quarry close to the Project site is a bedrock quarry area not formally documented, which is located adjacent to the southeast corner of the Project site, there would not be a conflict with an existing official mineral resource (Wilson Geosciences, 2011). As depicted in the corridor study (RMT, Inc., 2009), the closest active mining claim is just northeast of the Project site, on the northeast side of Blue Bell Mine Road, although, no active mining occurs at this site (RMT, Inc., 2011). The Project site is located to the south of Blue Bell Mine Road and the Proposed Action would not affect access to active mining claims north of Blue Bell Mine Road.

The Caltrans access road to the Opah Ditch pit mine runs adjacent to the Project site boundary northwest of I-15, and may be used periodically for construction of the collection line to the substation or Project site access. However, no Project facilities are planned in the vicinity of the Caltrans access road and the Proposed Action would not affect development of or access to the Opah Ditch site.

Moreover, the Proposed Action would not alter the jurisdiction or authority of the BLM; as with existing conditions, mining claims and mineral explorations on public lands within the BLM's

jurisdiction would be subject to the authority of the BLM. Operation and maintenance of the Proposed Action would not permanently preclude the availability for exploration, extraction, and transport of any mineral resources. Thus, the Proposed Action would not cause any adverse impacts to the availability of regionally or locally important mineral resources.

Decommissioning

Decommissioning of the Proposed Action would remove Project facilities, thereby making the land available for future exploration or production of aggregate materials. Therefore, decommissioning would not cause any adverse impacts to the availability of regionally or locally important mineral resources.

3.10.6.2 Alternative B

Under Alternative B, only the East and South arrays would be constructed, as described for the Proposed Action; the proposed North Array would not be constructed. This alternative includes an alternative southern alignment for Rasor Road. All other aspects of the proposed facility would remain substantially the same. The Project site would not change, and the footprint of Alternative B would include the same geologic units as the Proposed Action. Alternative B therefore would avoid adverse impacts to the availability of regionally or locally important mineral resources. However, Alternative B includes a reduced Project site footprint and final ROW compared to the Proposed Action and would affect fewer potential aggregate mineral resources. Thus, with regard to the availability of aggregate mineral resources, Alternative B presents a slightly preferable option relative to the Proposed Action.

3.10.6.3 Alternative C

Under Alternative C, only the North and South arrays would be constructed; the proposed East Array would not be constructed. All other proposed facility locations would be substantially the same as proposed. The footprint of Alternative C would include the same geologic and soil units as the Proposed Action, and so also would avoid adverse impacts to the availability of regionally or locally important mineral resources. However, Alternative C includes a reduced area of disturbance in comparison to the Proposed Action and would affect fewer potential aggregate mineral resources. Thus, with regard to the availability of aggregate mineral resources, Alternative C presents a slightly preferable option relative to the Proposed Action.

3.10.6.4 Alternative D

Under Alternative D, the North array would be constructed as described for the Proposed Action, and the East and South arrays would be reduced in size. The operation and maintenance buildings and brine ponds would be located further to the north, and the existing Rasor Road would be used for site access (i.e., no re-alignment). All other aspects of the Proposed Action would be substantially the same. The footprint of Alternative D would include the same geologic and soil units as the Proposed Action, and so also would avoid adverse impacts to the availability of regionally or locally important mineral resources. However, Alternative D includes a reduced

Project site footprint and final ROW in comparison to the Proposed Action and would affect fewer potential aggregate mineral resources. Thus, with regard to the availability of aggregate mineral resources, Alternative D presents a slightly preferable option relative to the Proposed Action.

3.10.6.5 Alternative E: No Action/No Project

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed and no realignment and no upgrade of Rasor Road would occur. Therefore, no impact would occur with respect to the availability of regionally or locally important mineral resources.

3.10.6.6 Alternative F: CEQA No Project

Under Alternative F, the BLM would approve the requested ROW grant under either Alternative A (Proposed Action), B, C, or D, and the County would deny the requested groundwater well permit application. In this event, a PV solar energy facility and related infrastructure could be developed on the site but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. The principal change under this alternative would be the need to acquire and deliver water to the Project site to satisfy all necessary demands. With respect to the location and footprint of Alternative A (Proposed Action), B, C, or D, and the subsequent potential effects on mineral resources, the changes introduced by Alternative F would be inconsequential. Thus, the impact of Alternative F on mineral resources would be the same as those described above for either Alternative A, B, C, or D, whichever would be approved by the BLM.

3.10.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project but would amend the CDCA Plan to identify the site as unsuitable for the proposed use, and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed and no realignment and no upgrade of Rasor Road would occur. Therefore, no impact would occur with respect to the availability of regionally or locally important mineral resources.

3.10.7 Cumulative Effects

The geographic scope of cumulative effects with respect to mineral resources would include all areas underlain by sand and gravel within eastern San Bernardino County, as sand and gravel are a potential source of saleable minerals or mineral materials. Projects that assign land areas to other uses, such as urban or infrastructure development or the construction of energy facilities, could

incrementally combine to reduce the availability of aggregate. Therefore, all of the projects identified as part of the cumulative scenario are considered within the geographic scope of this analysis.

The Proposed Action and alternatives would only have a minor adverse effect on the availability of mineral resources because sand and gravel is a widespread resource that underlies most of the desert basins in the region. If the Proposed Action and the other actions in the cumulative scenario were to be implemented, the resulting loss of land could amount to 231,000 acres, of which 24,150 acres would be for energy development. Although this is a considerable amount of land, there are approximately 7,285,000 acres underlain by similar Quaternary alluvium that could supply sand and gravel in San Bernardino County. Alternative B would result in the loss of 575 fewer acres than the Proposed Action; Alternative C, 399 fewer acres; and Alternative D, 505 fewer acres. Even if all projects were implemented and were in operation at the same time, over 7,050,000 acres would remain available for aggregate resource exploration and potential production. Alternative E would cause no impacts related to the availability of mineral resources, and so could not cause or contribute to a cumulative effect in this regard. Alternative F would cause the same incremental contribution to cumulative effects as whichever action alternative (Alternative A, B, C, or D) were approved by the BLM.

3.10.8 Mitigation Measures

With regard to the availability of regionally or locally important mineral resources, no mitigation measures are proposed to reduce or avoid adverse impacts.

3.10.9 Residual Effects

Because no APMs have been proposed and no mitigation measures are recommended, residual impacts would be the same as those described in Sections 3.8.6 and 3.8.7. All adverse impacts on the availability of mineral resources from construction, operation and maintenance, and decommissioning of the Proposed Action or alternatives would be avoided or substantially reduced. No residual effects would result from the Project.

3.10.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G Section XI, a project would have a significant impact on mineral resources if it would:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Because no known mineral resources exist on the site, the Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a land use plan. No impact would occur under either criterion for the Proposed Action or any of the alternatives.

Because the Proposed Action and the alternatives would cause no impact to mineral resources, none of them would cause or contribute to any cumulative effect on mineral resources.

References

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.aa6ec747.File.pdf/CA_Desert_.pdf]

BLM, 2011a. Mining Claims and Sites on Federal Lands. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/energy.Par.28664.File.dat/MiningClaims.pdf]

BLM, 2011b. Mineral Materials.[http://www.blm.gov/wy/st/en/field_offices/Rock_Springs/minerals/minmat.html] Accessed June 12, 2013.

BLM, 2013. Land & Mineral Legacy Rehost 2000 System - LR2000. [http://www.blm.gov/lr2000/] Reports generated May 15, 2013.

California Department of Conservation (CDOC), 2000. California Surface Mining and Reclamation Policies and Procedures, Guidelines for Classification and Designation of Mineral Lands. [http://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf]

CDOC, 2001. Oil, Gas, and Geothermal Fields in California. [ftp://ftp.consrv.ca.gov/pub/oil/maps/Map_S-1.pdf]

California Geological Survey (CGS), 2010. 2010 Geologic Map of California. [http://www.quake.ca.gov/gmaps/GMC/stategeologicmap.html] Accessed June 27, 2013.

RMT, Inc., 2009. Soda Mountain Utility Corridor Constraints Evaluation, Soda Mountain Solar Project, San Bernardino County, CA. November 2009.

RMT, Inc., 2011. Plan of Development Soda Mountain Solar Project, BLM Case Number - CACA49584. March.

San Bernardino County, 2007. County of San Bernardino 2007 General Plan, as amended.

Wilson Geosciences, Inc., 2011. Geologic Characterization Report for the Proposed Caithness Soda Mountain Solar Facility near Baker, San Bernardino, California.

3.11 Noise

3.11.1 Introduction

This section describes and evaluates issues related to noise in the context of the Proposed Action (also referred to as the Project) and alternatives. Discussed are general information on noise, the physical and regulatory setting, the analytical methodology of the analysis, the direct and indirect effects of the Proposed Action and alternatives, cumulative effects, mitigation, residual effects, and CEQA significance thresholds and determinations for the Proposed Action and alternatives. During the scoping process for this PA/EIS/EIR, one comment was received expressing concern about potential noise impacts on people and wildlife during all phases of the Project.

3.11.2 Regional and Local Environmental Setting

3.11.2.1 General Information on Noise

Noise Background

Noise is defined as unwanted sound. Noise can be described in terms of the following three variables: amplitude (loud or soft), frequency (pitch), and time pattern (variability), and its potential effects can be described in terms of a noise generating source, a propagation path, and a receiver (Federal Transit Administration [FTA], 2006). The ambient sound level of a region is defined by the total noise generated within the specific environment and usually is composed of sound emanating from natural sources (birds, leaves, etc.) and from human activities (yard maintenance, vehicles, talking, etc.). Ambient sound levels vary with time of day, wind speed and direction, and level of human activity. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Decibels (dB) are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. A ruler is a *linear* scale; it has marks on it corresponding to equal quantities of distance. One way of expressing this is to say that the ratio of successive intervals is equal to one. A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1; 10; 100; 1,000; 10,000; etc. Therefore, the cumulative noise level from two or more sources will combine logarithmically, rather than linearly. For example, if two identical noise sources produce a noise level of 50 dB each, the combined noise level would be 53 dB, not 100 dB.

Noise Exposure and Community Noise

Excessive noise exposure has been shown to cause interference with human activities at home, work, or recreation; and can cause community annoyance and hearing loss, as well as affect people’s health and well-being. Even though hearing loss is the most clearly measurable health hazard, noise is also linked to other psychological, sociological, physiological, and economic

effects, either temporary or permanent (USEPA, 1974). Potential human annoyance and health effects associated with noise may vary depending on factors such as: (1) the difference between the new noise and the existing ambient noise levels; (2) the presence of tonal noise, noticeable or discrete continuous sounds, such as hums, hisses, screeches, or drones; (3) low-frequency noise (frequency range of 8 to 1,000 Hertz [Hz]); (4) intermittent or periodic sounds, such as a single vehicle passing by, backup alarms, or machinery that operates in cycles; and (5) impulsive sounds from impacts or explosions (Brüel and Kjaer, 2000). In some cases, noise can also disrupt the normal behavior of wildlife. Although the severity of the effects varies depending on the species being studied and other conditions, research has found that wildlife can suffer adverse physiological and behavioral changes from intrusive sounds and other human disturbances (NPS, 2009).

To describe environmental noise and to assess impacts on areas sensitive to community noise, a frequency weighting measure that simulates human perception is customarily used. The frequency weighting scale known as A-weighting best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The dBA scale is cited in most noise criteria. In general, a difference of more than 3 dBA is a perceptible change in environmental noise, while a 5 dBA difference typically causes a change in community reaction. An increase of 10 dBA is perceived by people as a doubling of loudness, and almost certainly causes an adverse community response.

The community noise environment and the consequences of human activities cause noise levels to be widely variable over time. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (L_{eq}) or by an average level occurring over a 24-hour period. The L_{eq}, or equivalent sound level, is a single value for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually 1 hour. The maximum sound level (L_{max}) during a period can also be described as the maximum instantaneous sound pressure level generated by a piece or group of equipment. Since the sensitivity to noise increases during evening and nighttime hours when people are typically trying to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time sounds. The day-night average sound level or L_{dn}, is equal to the 24-hour equivalent sound level with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m.

Community noise levels are closely related to the intensity of human activity and land use. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In remote wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the L_{dn} is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas (e.g., downtown Los Angeles), and levels up to 85 dBA occur near major freeways and airports.

Effects of Noise on People

People experience a wide range of sounds in the environment. Typical noise levels of indoor and outdoor environments are shown in Figure 3.11-1. Excessive noise can be not only undesirable, but may also cause physical and/or psychological damage. The amount of annoyance or damage caused by noise depends primarily upon the amount and nature of the noise, the amount of ambient noise present before the intruding noise, and the activity of the person working or living in the area. Environmental and community noise levels rarely are of sufficient intensity to cause irreversible hearing damage, but disruptive environmental noise can interfere with speech and other communication and be a major source of annoyance by disturbing sleep, rest, and relaxation.

Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, the higher noise levels nevertheless are considered to be adverse to public health. The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments tend to be about 7 dB lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation that are subject to nighttime noise are often considered objectionable because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (USEPA, 1974).

Noise Attenuation

Sound level naturally decreases with more distance from the source. This basic attenuation rate is referred to as the *geometric spreading loss*. The basic rate of geometric spreading loss depends on whether a given noise source can be characterized as a point source or a line source. Point sources of noise, including stationary mobile sources such as idling vehicles or on-site construction equipment, attenuate (lessen) at a rate of 6.0 dBA per doubling of distance from the source. In many cases, noise attenuation from a point source increases by 1.5 dBA from 6.0 dBA to 7.5 dBA for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dBA per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

Widely distributed noises such as a street with moving vehicles (a “line” source) would typically attenuate at a lower rate of approximately 3.0 dBA for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases by 1.5 dBA to 4.5 dBA for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also

influence noise attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 2006). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

3.11.2.2 Project Setting

The Project site is located on BLM-administered land in a rural area of the Mojave Desert, east of the western Soda Mountains in unincorporated San Bernardino County. The site is approximately 6 miles southwest of the town of Baker, California, approximately 50 miles northeast of Barstow, and is located on both the northwest and southeast sides of I-15. It is near the western boundary of the Mojave National Preserve. The lands in the vicinity of the site are primarily undeveloped with the exception of I-15 and a service station and adjacent residences off the Rasor Road off-ramp.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, also are sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

The Project site is not within the immediate vicinity of any non-residential sensitive receptors (e.g., schools, hospitals, daycare centers, or long-term care facilities). The closest schools are Baker Elementary, Middle, and High Schools, which are all over 6.5 miles from the Project site, in the northeastern portion of Baker. The closest residences to the Project site are located adjacent to the service station on Rasor Road, approximately 230 feet southwest of the requested ROW boundary (see Figure 3.2-1, which shows residence locations). The residences include a single family residence and workforce housing for four employees.

Additionally, the California State University Desert Studies Center field station is located approximately 3.5 miles east of the Project site, on Zzyzx Road. The Desert Studies Center is a research and educational center that can accommodate 75 individuals in dormitory-style rooms holding 2 to 12 persons. Camping is permitted in the Rasor Open Area approximately 2.5 miles south of the requested ROW boundary, accessible from the Rasor Road exit off I-15.

Ambient Noise Conditions

The primary existing noise source in the Project area is traffic along I-15. Because traffic noise along I-15 is the dominate noise source in the Project area, ambient noise levels were estimated by the BLM's consultant using the Federal Highway Administration's (FHWA) Noise Prediction Model algorithms (ESA, 2013a) to characterize ambient noise conditions at the residences adjacent to the service station on Rasor Road. The model uses Calveno reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle trip volume, speed, distance to the receiver, and the acoustical characteristics of the site. The trip volume estimates are based on California Department of Transportation (Caltrans) 2012 hourly traffic count data for I-15 in the vicinity of Rasor Road (Caltrans, 2012a) as well as Caltrans annual average daily truck traffic data for 2011, which indicates that traffic along I-15 in the vicinity of Rasor Road is comprised of 80 percent automobiles, 5 percent medium trucks, and 15 percent heavy trucks (Caltrans, 2012b). The existing traffic noise was modeled assuming the average traffic speed along I-15 is 65 miles per hour. Table 3.11-1 identifies the modeled ambient traffic noise levels at the nearest residences, which are located approximately 750 feet from the centerline of I-15, in terms of the daytime hourly L_{eq} range, the nighttime hourly L_{eq} range, and L_{dn}.

TABLE 3.11-1
MODELED AMBIENT TRAFFIC NOISE LEVELS AT NEARBY RESIDENCES

Modeled Receptor Site	Modeled Traffic Noise Levels, dBA		
	Daytime Hourly L_{eq} (7:00 a.m. - 10:00 p.m.)	Nighttime Hourly L_{eq} (10:00 p.m. to 7:00 a.m.)	L_{dn}
Residences adjacent to the service station on Rasor Road	58.5 - 62.5	55.0 - 58.6	64.0

SOURCE: ESA, 2013a, based on Caltrans, 2012a and 2012b.

As summarized in Table 3.11-1, ambient traffic noise levels at the closest residences to the Project site are moderate to high with hourly L_{eq} traffic noise levels that range from approximately 55 dBA early in the morning to 63 dBA in the early afternoon, and the L_{dn} is 64 dBA. The land surrounding the Project site is undeveloped, with secondary noise sources that include occasional off-road vehicles (four wheel drive vehicles, all terrain vehicles, and motorcycles/dirt bikes) in the area. These uses can generate loud and intermittent noise levels depending on the proximity to the receptor. Intermittent aircraft noise can be audible from aircraft approaching and departing the Baker Airport, approximately 7 miles northeast of the Project site.

3.11.3 Applicable Laws, Regulations, Plans, and Standards

Regulating environmental noise is generally the responsibility of local governments. The USEPA, however, has published guidelines on recommended maximum noise levels to protect public health and welfare, and the State of California maintains recommendations for local jurisdictions in the General Plan Guidelines published by the Governor's Office of Planning and Research. The following summarizes the federal and State recommendations and local requirements.

3.11.3.1 Federal

Occupational Safety and Health Act

Under the Occupational Safety and Health Act of 1970 (29 USC §651 et seq.), the U.S. Department of Labor, OSHA adopted regulations (29 CFR 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list limits on noise exposure levels as a function of the amount of time during which the worker is exposed, as shown in Table 3.11-2. The regulations further specify requirements for a hearing conservation program (1910.95(c)), a monitoring program (1910.95(d)), an audiometric testing program (1910.95(g)), and hearing protection (1910.95(i)). There are no federal laws governing community noise.

TABLE 3.11-2
OSHA-PERMISSIBLE NOISE EXPOSURE STANDARDS

Duration of Noise (hours/day)	A-Weighted Noise Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

SOURCE: USEPA, 1974. 29 CFR §1910.95, Table G-16

Although no federal noise regulations exist, the USEPA has promulgated noise guidelines (USEPA, 1974). The USEPA guideline recommends an L_{dn} of 55 dBA to protect the public from the effect of broadband environmental noise outdoors in residential areas and farms, and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use (USEPA, 1974).

3.11.3.2 State

California Government Code Section 65302 encourages each local government entity to implement a noise element as part of its general plan. In addition, the California Governor's Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (9 Cal. Code Regs. §§5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

3.11.3.3 Local

San Bernardino County General Plan

The following policies identified in the Noise Element of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

> ***Policy N 1.3*:** When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses. [It should be noted that the General Plan does not include a Table N-2.]
>
> ***Policy N 1.6*:** Enforce the hourly noise-level performance standards for stationary and other locally regulated sources such as industrial, recreational, and construction activities as well as mechanical and electrical equipment. [See the San Bernardino County's Code criteria below.]
>
> ***Policy N 2.2*:** The County will continue to work aggressively with federal agencies, including the branches of the military, the U.S. Forest Service, the BLM, and other agencies to identify and work cooperatively to reduce potential conflicts arising from noise generated on federal lands and facilities affecting nearby land uses in unincorporated County areas.

San Bernardino County Code

San Bernardino County regulates noise with County Code Section 83.01.080, *Noise*. Per Section 83.01.080(a), (b), and (c), residential areas within the County are considered "noise-impacted" if exposed to existing or projected future exterior mobile source noise levels of 60 dBA L_{dn} or stationary source noise levels of 55 dBA L_{eq} between 7:00 a.m. and 10:00 p.m. and/or 45 dBA L_{eq} between 10:00 p.m. and 7:00 a.m. However, Section 83.01.080(e) indicates that the allowable noise exposure standards shall be increased to reflect the ambient noise level

if the ambient noise level exceeds the standards, and ambient noise levels in the vicinity of the residences off Rasor Road currently exceed the mobile and stationary source standards (see Table 3.11-1); therefore, the allowable noise exposure standards applicable to the nearby residences are the ambient levels at the residences. Temporary construction, maintenance, repair, or demolition activities that occur between 7:00 a.m. and 7:00 p.m. are exempt from these standards except on Sundays and federal holidays (San Bernardino County, 2012).

With regard to vibration, County Code Section 83.01.090, *Vibration*, requires that no ground vibration be allowed that can be felt without the aid of instruments at or beyond the lot line, or if the vibration produces a particle velocity greater than or equal to 0.2 in/sec measured at or beyond the lot line (San Bernardino County, 2012). Temporary construction, maintenance, repair, or demolition activities are exempt from the vibration standards between 7:00 a.m. and 7:00 p.m. except on Sundays and federal holidays.

3.11.4 Analytical Methodology

This analysis evaluates potential noise impacts of the Proposed Action and alternatives based on review of sensitive receptors, estimated ambient noise levels, and projected noise levels that would be associated with construction, operation, maintenance, and decommissioning of the Proposed Action and alternatives. The following methods were used to estimate noise levels and evaluate impacts.

3.11.4.1 Construction and Decommissioning Noise Impacts

Noise levels that would be generated by Project-related construction activities were estimated by the BLM's and the County's consultant (ESA, 2013b). On-site construction activity noise associated with the Proposed Action was estimated using widely accepted equations for combining and attenuating point source noise levels with the excess ground attenuation rate (i.e., reduction of 7.5 dBA per doubling of distance; see *Noise Background* and *Noise Attenuation* discussions in Section 3.11.2.1). The FTA-recommended reference noise levels for representative pieces of construction equipment identified by the Applicant's consultant were used in the analysis (FTA, 2006; Panorama Environmental Inc., 2013). In addition, traffic noise that would be associated with the Project was modeled using FHWA's Noise Prediction Model algorithms (ESA, 2013a).

The FTA has identified a daytime 8-hour L_{eq} of 80 dBA as a noise level at which adverse community reaction to short-term construction noise could occur (FTA, 2006). In addition, pursuant to San Bernardino County guidance, potential nighttime construction activity noise levels were evaluated relative to existing baseline noise levels, which currently exceed the County's nighttime hourly L_{eq} standard of 45 dBA (see Table 3.11-1). Therefore, for the purposes of this analysis, estimated construction and decommissioning noise levels at sensitive receptor locations in the vicinity of the Project site are compared to an L_{eq} of 80 dBA for daytime noise (i.e., 7:00 a.m. to 10:00 p.m.) and 55 dBA for nighttime noise (the lowest hourly ambient L_{eq}), to identify potential adverse noise levels.

3.11.4.2 Operation and Maintenance Noise Impacts

Noise levels that would be generated by Project-related operation and maintenance were estimated based on noise levels that were modeled for an acoustical analysis conducted for a large-scale solar PV project with similar technology to that proposed for the Proposed Action (Tetra Tech, 2011). Pursuant to San Bernardino County guidance, operation and maintenance noise levels were evaluated relative to existing daytime baseline noise levels (see Table 3.11-1), which currently exceed the County's daytime hourly L_{eq} standard of 55 dBA. Nighttime noise generated by the Project would be negligible. Therefore, for purposes of this analysis, operation and maintenance noise levels at sensitive receptor locations in the vicinity of the Project site are compared to an L_{eq} of 59 dBA (the lowest ambient hourly L_{eq}) to identify potential adverse noise levels.

3.11.4.3 Vibration Impacts

This analysis uses a PPV threshold identified by Caltrans and the County to determine the level of vibration impacts. The PPV threshold is 0.20 in/sec (Caltrans, 2004 and San Bernardino County, 2012). This PPV level has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

3.11.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APM to reduce noise impacts (Soda Mountain Solar, LLC, 2013).

> **APM 28:** Noise exposure for construction and maintenance workers shall adhere to all federal, California, and San Bernardino County noise exposure regulations.

3.11.6 Direct and Indirect Effects

3.11.6.1 Alternative A: Proposed Action

Construction Noise

Noise from construction of the Proposed Action would result from construction equipment at the Project site and from vehicle traffic to and from the Project site. Noise level exposures resulting from construction equipment would fluctuate widely depending on the construction activity, equipment type, and distance between noise sources and receptors. Noise from construction equipment would vary depending on the construction phase and the number and class of equipment that would operate at a location at any given time. Given that construction activities would take place within the ROW, many components of the Proposed Action would be located at distances from the nearest sensitive receptors that would cause construction noise to be attenuated to below existing ambient noise levels.

As described in Section 3.11.2.2, the closest sensitive receptors to the Project site are residences that are adjacent to the service station on Rasor Road, approximately 230 feet southwest of the southern border of the requested ROW. The closest on-site construction activities to these residences would be associated with the proposed Rasor Road reroute, the operation and maintenance buildings, and the South Array. For the worst-case construction noise analysis, it was assumed that the two loudest pieces of construction equipment associated with each of the closest construction activities would operate concurrently and immediately adjacent to each other. Therefore, construction noise levels were estimated based on the understanding that the Rasor Road reroute construction activities would include operation of a grader and compactor at a distance of approximately 600 feet from the residences; the operation and maintenance building construction activities would include operation of a grader and compactor at a distance of approximately 1,300 feet from the residences; and construction activities associated with installation of the South Array would include operation of an impact pile driver and a dozer at a distance of 2,660 feet from the residences. Table 3.11-3 provides the estimated construction noise levels that would be associated with the closest construction activities to the nearby residences based on this worst-case scenario.

TABLE 3.11-3
ESTIMATED CONSTRUCTION NOISE LEVELS FOR THE PROPOSED ACTION

Project Component	Distance from Residences	Hourly L_{eq} (dBA)	
		At 50 Feet	At Residences
Rasor Route Reroute	600 feet	86.8	59.8
Operation and Maintenance Buildings	1,300 feet	90.5	55.1
South Array	2,660 feet	101.1	57.9
Combined Noise Level	---	---	62.8

As indicated in Table 3.11-3, construction activities associated with the proposed Rasor Road reroute, operation and maintenance buildings, and the South Array would result in a worst-case hourly L_{eq} at the Rasor Road residences that would range between approximately 55 dBA to 60 dBA, and the combined maximum L_{eq} from on-site construction activity would be approximately 63 dBA. In addition to on-site construction activities, there would be up to 400 daily heavy truck one-way trips and 1,000 automobile one-way trips that would arrive and leave the Project site each day. Assuming approximately 50 percent of the automobile trips and 10 percent of the truck trips would pass within 300 feet of the Rasor Road residences at the southern entrance to the site at 25 mph during a single hour, the peak-hour L_{eq} from construction traffic was modeled to be approximately 54 dBA. Combined with the on-site construction noise, the Project-related vehicle noise increase would be negligible (i.e., approximately 0.6 dBA). The combined construction noise level at the residences would result in an increase in ambient levels of up to 5 dBA during daytime hours, and an increase of up to 8 dBA during nighttime hours.

Construction is expected to occur between 6:00 a.m. and 6:00 p.m., Monday through Saturday, with some work occurring on Sundays and outside these hours, if needed. The worst-case daytime hourly construction L_{eq} would likely be distinguishable from ambient I-15 traffic noise at the nearby residences, but would be substantially less than 80 dBA (the construction noise level FTA has identified as potentially causing an adverse community reaction). Therefore, short-term daytime construction noise levels would not be considered adverse. With regard to any nighttime construction activities or construction activities that would occur on Sundays, worst-case construction noise levels would exceed ambient conditions, resulting in a short-term adverse effect on nearby residences. To ensure that construction noise between 10:00 p.m. and 7:00 a.m. do not exceed ambient noise levels at the nearby residences, Mitigation Measure 3.11-1 is recommended, which would limit nighttime construction activities in the vicinity of the nearby residences (see Section 3.11.5).

Operation and Maintenance Noise

The Project would result in four potential sources of long-term noise, including operation of the solar power plant equipment, the proposed substation, on-site maintenance activities, and off-site commuting workers and delivery trips. Below are discussions of the noise effects that would be associated long-term operation of the Proposed Action.

Solar Plant Stationary Sources

The proposed substation would be located more than 3.4 miles away from the closest residences. At this distance, substation-related noise levels would not be audible. The South Array would be at a distance of 2,660 feet to the nearest residences. The proposed PV solar arrays would be organized in 2 MW blocks consisting of PV modules, tracking assemblies, invertors, and transformers. Based on acoustic modeling output in the form of plotted sound isopleths for a large-scale solar PV project with similar technology to that proposed for the Project generated using the DataKustic GmbH's CadnaA (v4.2.139) program, solar array noise levels at the nearby residences would be less than 35 dBA (Tetra Tech, 2011). Noise from the solar array would primarily be generated during the daytime. After sunset, when the plant would no longer receive solar radiation, noise levels would be substantially reduced. In addition, periodic testing and maintenance of the proposed emergency generator would occur for several hours per day, once each month. Assuming that the generator would result in an average noise level of 81 dBA at 50 feet (FTA, 2006), periodic generator noise at the nearest residences located at a distance of approximately 1,300 feet would be approximately 47 dBA. The lowest ambient daytime hourly L_{eq} estimated for the area near the residences is approximately 59 dBA (see Table 3.11-1). Therefore, solar plant stationary source noise levels would not be audible at the nearest residences.

On-Site Maintenance Activities

Operation and maintenance of the Proposed Action would require a workforce of up to 40 employees at the Project site. The employees would inspect components of the solar farm, perform preventive maintenance, and conduct PV panel washing. In addition, some amount of

unscheduled maintenance and repair would likely be necessary. These maintenance-related activities would not be expected to be audible at the nearest residence.

Off-Site Commuting Employee and Delivery Truck Traffic

Operation and maintenance–related traffic generally would be associated with the 40 workers traveling to and from the Project site each day. In addition, it is estimated that approximately four daily truck deliveries to the solar plant site would be required. This would result in a total of 44 additional daily round trips (88 one-way trips) on the local roadways and highways, which do not occur under existing conditions. The addition of these trips on I-15 and Rasor Road would not result in a perceivable increase in average ambient noise levels at nearby residences.

Decommissioning Noise

At the end of the 30-year term of the BLM ROW grant, operation of the Project would cease and associated facilities would be decommissioned and dismantled, and the site would be restored. Decommissioning activities could generate temporary noise levels and effects similar to those that would occur during construction (see above).

Vibration

Temporary sources of groundborne vibration and noise during construction and decommissioning would result from operation of heavy construction equipment. Pile driving would produce the highest levels of vibration. Impact pile driving can generate vibration levels of up to 1.52 in/sec at a distance of 25 feet (FTA, 2006). However, vibration levels attenuate rapidly from the source. At a distance of 100 feet from pile driving, vibration would be less than 0.2 in/sec. Therefore, construction and decommissioning of the Project would cause no adverse vibration-related effects. Operation and maintenance of the Proposed Action would not introduce any new sources of perceivable groundborne vibration to the study area. Consequently, the Proposed Action would cause no operation- or maintenance-related effects associated with groundborne vibration.

3.11.6.2 Alternative B

Alternative B would consist only of the East and South arrays as described for the Proposed Action and the BLM-proposed Rasor Road realignment (see Figure 2-5). Under Alternative B, the closest portion of the alternative Rasor Road realignment would be at a distance of approximately 300 feet, which would result in a maximum combined on-site equipment and vehicle traffic noise L_{eq} of 68 dBA at the nearby residences, compared to 63 dBA that would be associated with the Proposed Action. Nighttime construction activities or construction activities that would occur on Sundays associated with Alternative B could result in worst-case construction noise levels that would exceed ambient conditions, resulting in a short-term adverse effect on nearby residences. To ensure that construction noise between 10:00 p.m. and 7:00 a.m. does not exceed ambient noise levels at the nearby residences, Mitigation Measure 3.11-1 is recommended, which would limit nighttime construction activities in the vicinity of the nearby residences (see Section 3.11.8). All other direct and indirect effects identified for construction,

operation, maintenance, and decommissioning of the Proposed Action would be applicable to Alternative B (see Section 3.11.6.1).

3.11.6.3 Alternative C

Alternative C would be the same as the Proposed Action with the exception of the East Arrays, which would not be constructed. All direct and indirect effects identified for construction, operation, maintenance, and decommissioning of the Proposed Action would be applicable to Alternative C (see Section 3.11.6.1).

3.11.6.4 Alternative D

Alternative D would be similar to the Proposed Action; however, the East and South arrays would be reduced in size and Rasor Road would not be realigned. The closest Alternative D component to the nearby residences would be a flood protection berm at a distance of approximately 4,700 feet (0.9 mile) and the operation and maintenance buildings and closest solar array would be well over a mile from the nearest residences. Assuming the two loudest pieces of equipment required to construct the flood protection berm would be a grader and dozer, the maximum combined on-site equipment and vehicle traffic L_{eq} associated with Alternative D would be 55 dBA, compared to 63 dBA that would be associated with the Proposed Action. This level would equal the lowest ambient average nighttime L_{eq}, and therefore would not be considered adverse. No mitigation is recommended for construction of Alternative D. All of the other direct and indirect effects for construction, operation, maintenance, and decommissioning of Alternative D also would be reduced compared to the Proposed Action (see Section 3.11.6.1).

3.11.6.5 Alternative E: No Action/No Project

If Alternative E was implemented, no changes would occur, and the existing environmental setting described in Section 3.11.2 would be maintained. As a no-development alternative, Alternative E would result in no changes to existing ambient noise levels; therefore, no impact would occur.

3.11.6.6 Alternative F: CEQA No Project

Because Alternative F would require an off-site source of water, it would require a maximum of 30 additional truck trips (60 one-way trips) per day relative to the Proposed Action (Pan Environmental, Inc., 2013). Assuming 10 percent of the water trips would occur during the peak hour, the peak hour construction traffic noise level would increase by 1 dBA to 55 dBA compared to the Proposed Action. During operation and maintenance, Alternative F would require an additional 22 one-way truck trips per day to deliver water to the site, which would equate to approximately two additional trips during the peak hour. These additional trips would be expected to increase the Project-related noise levels by less than 1 dBA.

3.11.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G was implemented, no changes would occur, and the existing environmental setting described in Section 3.11.2 would be maintained. As a no-development alternative, Alternative G would result in no changes to existing ambient noise levels; therefore, no impact would occur.

3.11.7 Cumulative Effects

Noise levels tend to diminish quickly with distance from a source; therefore, the geographic scope for cumulative impacts associated with noise would be limited to projects located within approximately 0.5 mile of the Project site. The temporal scope for cumulative impacts associated with noise would include the construction, operation, maintenance, and decommissioning phases of the Project.

3.11.7.1 Existing Cumulative Conditions

Any continuing noise impacts of past projects are reflected in the environmental conditions described in Section 3.11.2. Briefly, the Project site is currently undeveloped. The existing predominant source of noise in the Project area is traffic on I-15, which has been estimated to produce an L_{dn} of 64 dBA at the residences just south of the Project ROW. According to County standards (see Section 3.11.3.2), these residences are “noise impacted” and indicate an adverse cumulative effect related to ambient traffic noise.

Among the projects identified in Section 3.1.5 and shown in Figure 3.1-1, there are two pending projects that could be constructed and/or in operation at the same time and within 0.5 mile of the Project: the Calnev Pipeline Expansion Project and the XpressWest High Speed Passenger Rail Project, both on the northwest side of I-15. Construction and operation of these projects could contribute to the ongoing adverse traffic noise conditions in the area. If these projects are constructed or decommissioned at the same time as the construction of the Proposed Action, the combined noise levels at nearby noise receptors could exceed the noise levels estimated for the Project, resulting in an adverse cumulative impact. However, implementation of Mitigation Measure 3.11-1 would ensure that construction noise generated by the Proposed Action would be reduced to ambient levels or less (see Section 3.11.6.1). Therefore, the Proposed Action would not cause or contribute to a substantial cumulative effect.

If the two cumulative projects identified above are in operation at the same time as operation and maintenance of the Proposed Action, the combined noise levels at nearby noise receptors could exceed the noise levels estimated for the Project. However, the Proposed Action would result in operation and maintenance noise levels that would be substantially less than the ambient noise levels in the vicinity of nearby residences (see Section 3.11.6.1); therefore, the Proposed Action would not cause or contribute to a substantial cumulative effect.

It is anticipated that decommissioning of the Proposed Action or an action alternative and restoration of the Project site would result in substantially the same cumulative impacts as those associated with construction (see Section 3.11.7.4).

3.11.8 Mitigation Measures

Mitigation Measure 3.11-1: Construction and decommissioning activities associated with the operation and maintenance buildings, pile driving within 1.5 miles of residences, and the Rasor Road reroute within 1 mile of residences shall not occur between the hours of 10:00 p.m. and 7 a.m., Monday through Saturday, or at any time on Sundays.

3.11.9 Residual Effects

Implementation of Mitigation Measure 3.11-1 would reduce the nighttime peak-hour L_{eq} during construction of the Proposed Action from 63 dBA to 55 dBA, which would equal the lowest ambient average nighttime hourly L_{eq}. There would be no residual adverse impacts if this mitigation measure is incorporated.

3.11.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section XII, a project would have a significant impact related to noise if it would:

a) Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels;

c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport, expose people residing or working in the area to excessive noise levels; or

f) For a project located in the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

3.11.10.1 Alternative A: Proposed Action

a) Impact Noise-1: Construction and decommissioning of the Proposed Action could expose persons to nighttime noise levels in excess of San Bernardino County noise standards. (Less than Significant with Mitigation Incorporated)

Construction and decommissioning of the Project is expected to occur between 6:00 a.m. and 6:00 p.m., Monday through Saturday with some work occurring on Sundays and outside these hours, if needed. Pursuant to San Bernardino County Code Section 83.01.080, *Noise*, temporary construction activities are exempt from complying with noise standards if they occur between 7:00 a.m. and 7:00 p.m., except on Sundays and federal holidays. If construction activities take place outside of these hours and exceed existing ambient noise levels, a significant impact would result. The implementation of Mitigation Measure 3.11-1 would reduce construction noise levels to equal or less than ambient noise levels (see Section 3.11.6.1), and thereby reduce the impact to less than significant. For the reasons discussed in Section 3.11.7, the Proposed Action would not have a cumulatively considerable contribution to cumulative impacts relating to nighttime noise levels.

Operation and maintenance of the Proposed Action would result in noise levels that would not exceed San Bernardino County noise standards. (No Impact)

Operation and maintenance of the Proposed Action would result in long-term noise levels that would not exceed San Bernardino noise standards and would not be audible at the nearest sensitive receptors (see Section 3.11.6.1). There would be no impact. Because the Proposed Action would cause no impact relative to this CEQA consideration, it could not cause or contribute to any cumulative effect regarding exceedances of San Bernardino County noise standards.

b) The Proposed Action would not result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels (No Impact)

As discussed in Section 3.11.6.1, construction and operation of the Proposed Action would not result in vibration levels that would exceed the County's threshold of 0.2 in/sec. Further, because vibration associated with the Project would not be detectable and would not increase ambient levels at sensitive receptor locations, the Proposed Action would cause no vibration or groundborne noise-related impacts, and so would not cause or contribute to any cumulative effect related to this subject.

c) The Proposed Action would not result in a permanent increase in ambient noise levels in the Project vicinity above existing levels. (No Impact)

Operation and maintenance of the Proposed Action would result in long-term noise levels that would be approximately 20 dBA below ambient noise levels, and so would not exceed ambient noise levels (see Section 3.11.6.1). There would be no impact. Because the Proposed Action would cause no impact relative to this CEQA consideration, it could not cause or contribute to any cumulative effect regarding a permanent increase in ambient noise levels in the Project vicinity.

d) Impact Noise-2: Construction and decommissioning of the Proposed Action would increase ambient noise levels. (Less than Significant with Mitigation)

For the reasons described in Section 3.11.6, construction and decommissioning of the Proposed Action would increase ambient noise levels such that a significant impact would result. The implementation of Mitigation Measure 3.11-1 would reduce such noise levels to equal or less than ambient conditions (see Section 3.11.6.1). Therefore, the impact would be reduced to less than significant. For the reasons described in Section 3.11.7, the Proposed Action would not have a cumulatively considerable contribution to any significant cumulative effect related to increased ambient noise levels.

e) The Proposed Action would not expose people residing or working in the area of a public airport or public use airport to excessive noise levels. (No Impact)

The Project would be located approximately 6.8 miles southwest of the Baker Airport, and, at this distance, would not expose Project workers to excessive airport noise levels. In addition, the Project would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise. No impact would occur. Because the Proposed Action would cause no impact relative to this consideration, it could not cause or contribute to any cumulative effect related to the exposure of people residing or working in the area of a public airport or public use airport to excessive noise levels.

f) The Proposed Action would not expose people residing or working in the area of a private air strip to excessive noise levels.

The Project would be located approximately 4 miles west of the Zzyzx Airstrip. There is also a historical private airstrip located adjacent to the Rasor Road service station (near the junction of Rasor Road and I-15, southwest of the Project site) that is listed as “unverified” (Panorama Environmental, Inc., 2013). At these distances, the Project would not expose Project workers to excessive airstrip noise levels. No impact would occur. Because the Proposed Action would cause no impact relative to this consideration, it could not cause or contribute to any cumulative effect related to the exposure of people residing or working in the area of a private airstrip to excessive noise levels.

3.11.10.2 Alternative B

The impact statements and CEQA significance determinations identified for the Proposed Action also apply to Alternative B. See Section 3.11.10.1.

3.11.10.3 Alternative C

The impact statements and CEQA significance determinations identified for the Proposed Action apply equally to Alternative C. See Section 3.11.10.1.

3.11.10.4 Alternative D

The impact statements and CEQA significance determinations identified for the Proposed Action also apply to Alternative D, with the exception of Impact Noise 3.11-1. Under Alternative D, Impact Noise 3.11-1 would be less than significant and mitigation is not recommended (see Section 3.11.6.4). See Section 3.11.10.1 for the Proposed Action CEQA significance determinations.

3.11.10.5 Alternative E: No Action/No Project

As a no-development alternative, Alternative E would not result in noise impacts from Project construction, operation and maintenance, or decommissioning because it would result in no change from the existing conditions described in Section 3.11.2. Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect associated with noise.

3.11.10.6 Alternative F: CEQA No Project

The impact statements and CEQA significance determinations identified for the Proposed Action and other action alternatives would apply to Alternative F, depending on the specific layout and size of the solar energy facility that would be developed. The requirement that water be transported to the site rather than be pumped from groundwater within its boundaries would not have a substantial effect on the determinations of significance of potential noise impacts because as described in Section 3.11.6.6, the additional trips would be expected to increase the Project-related noise levels by less than 1 dBA.

3.11.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

As a no-development alternative, Alternative G would not result in noise impacts because it would result in no change from the existing conditions described in Section 3.11.2. Because it would cause no impact to any of the CEQA criteria considered above, Alternative G would not cause or contribute to any cumulative effect associated with noise.

References

Brüel and Kjaer, 2000. Sound and Vibration Measurement A/S, Environmental Noise Booklet, Document published by The Noise Pollution Clearinghouse (NPC). [http://www.nonoise.org/library/envnoise/] Accessed June 10, 2013.

California Department of Transportation (Caltrans), 2004. Noise, Vibration, and Hazardous Waste Management Office, 2004, Transportation- and Construction-Induced Vibration Guidance Manual, June.

Caltrans, 2012a. Caltrans Traffic Volumes Report OTM32520 – Detailed All Vehicle Hourly Count (September 1, 2012 – September 30, 2012), provided by Caltrans District 8 Staff, Traffic Stations 907; prepared for Environmental Science Associates, November 14, 2012.

Caltrans, 2012b. 2011 Traffic Volumes on California State Highways. [http://traffic-counts.dot.ca.gov/index.htm] Accessed June 2013.

Environmental Science Associates (ESA), 2013a. Average Peak-Hour and Minimum-Hour Traffic Volumes Estimates for Interstate 15, August, 2013.

ESA, 2013b. Construction and Operation Noise Estimates for the Soda Mountain Solar Project, August, 2013.

Federal Transit Administration (FTA), 2006. Transit Noise and Vibration Impact Assessment, May.

Pan Environmental, Inc., 2013. Final Air Quality and Greenhouse Gas Impact Analysis Soda Mountain Solar Project, May.

Panorama Environmental Inc., 2013. Equipment and Hours of Use Excel Spreadsheet.

National Park Service (NPS), 2009. Effects of Noise. [www.nature.nps.gov/naturalsounds/impacts] Accessed June 10, 2013.

Soda Mountain Solar, LLC, 2013. Applicant Proposed Measures, Soda Mountain Solar Project, BLM Case No. CACA 48584, July 2013.

San Bernardino County, 2007. San Bernardino County General Plan

San Bernardino County, 2012. County of San Bernardino 2007 Development Code. Amended December 27, 2012

Tetra Tech, 2011. McCoy Solar Energy Project Acoustic Analysis, prepared for Bureau of Land Management, California Desert District Office, December.

U.S. Environmental Protection Agency (USEPA), 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March. [http://www.nonoise.org/library/levels74/levels74.htm] Accessed June 10, 2013.

This page intentionally left blank

3.12 Paleontological Resources

3.12.1 Introduction

Paleontological resources, or fossils, are the remains of extinct organisms, and they provide the only direct evidence of ancient life. They are considered to be non-renewable resources because they cannot be replaced once they are destroyed. The BLM Instructional Memorandum "Assessment and Mitigation of Potential Impacts to Paleontological Resources" (2008) defines "significant paleontological resources" as any fossil that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be of scientific interest if it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has an identified educational or recreational value. Paleontological resources that may be considered not to have scientific significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes (such as tortoise shells), skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (fossilized feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities. (BLM, 2008)

This section describes the paleontological resources present on the Project site and surrounding area, and evaluates the potential impacts of the Proposed Action and alternatives on these resources.

3.12.2 Regional and Local Environmental Setting

The Mojave Desert has a northwestern boundary defined by the Tehachapi Mountains and the Garlock Fault, a southwestern boundary defined by a series of mountain ranges and the San Andreas Fault, and an eastern boundary roughly defined by the Colorado River. The Garlock Fault is a large (approximately 250 km) sinistral strike-slip fault that traces from its intersection with the San Andreas Fault in the northwestern Mojave east towards the Basin and Range. The San Andreas Fault System is composed primarily of the dextral strike-slip San Andreas Fault, and forms the boundary between the Pacific and North American tectonic plates.

The geology of the Mojave Desert is complex, and rocks found in the Mojave Desert represent nearly all divisions of geologic time, from Precambrian basement rocks to modern alluvium. Paleozoic strata found in the Mojave are typically representative of continental margin depositional environments (Walker et al., 2002a). Mesozoic rocks include marine and nonmarine sedimentary rocks, volcanics, and plutonic igneous bodies which were emplaced during the Nevadan orogeny. Cenozoic strata in the Mojave Desert are widespread, and typically include both volcanic and sedimentary rock types.

In their geologic mapping, Walker et al. (2002b) mapped the area within and near the Project site as Quaternary alluvium,[1] Quaternary older alluvium, Tertiary nonmarine, Tertiary volcanics, Jurassic quartz monzonite, and Triassic to Jurassic metavolcanics (Table 3.12-1, Figure 3.12-1). In the northern portion of the Project site, mapping indicates Quaternary deposits (Quaternary alluvium) at the surface in an area indicated as Ruin Flats (Grose, 1959). Grose (1959) indicated that "alluvium forms merely a veneer over most of Target, Ruin, and Jeep flats." In a geologic cross section created of this area, Grose (1959) mapped the Avawatz Formation underlying the Quaternary alluvium at shallow depth. Additionally, sediments referable to Quaternary older alluvium were identified during the field survey underlying the Recent alluvium or exposed at the surface, primarily near the base of elevated terrain. Thus, although Quaternary alluvium is mapped as being present at the surface over much of the northern portion of the Project site, the Quaternary older alluvium and/or Avawatz Formation may still be encountered in the shallow subsurface. In the southeastern portion of the Project site, maps indicate that the Project would lie on Quaternary alluvium or Jurassic quartz monzonite. The southwestern portion of the Project site is mapped as Quaternary alluvium, although the close proximity of the Project boundaries to outcrops of Tertiary volcanics indicates that it is likely that the Quaternary alluvium in some areas is underlain by the Tertiary volcanics at shallow depth.

TABLE 3.12-1
SURFACE GEOLOGY AND PALEONTOLOGICAL RESOURCE POTENTIAL OF GEOLOGIC UNITS WITHIN 1 MILE OF THE PROJECT SITE

Geologic Unit & Map Abbreviation	Typical Fossils	Age	PFYC Ranking
Andesite (Tva)	None	Tertiary	Class 1 *(very low potential)*
Quartz monzonite (Jqm)	None	Jurassic	Class 1 *(very low potential)*
Rhyolite (Tvr)	None	Tertiary	Class 1 *(very low potential)*
Metavolcanic (JTrv)[1]	None[2]	Triassic	Class 1 *(very low potential)*
Alluvium (Qal)	None	Quaternary (Holocene)	Class 2 *(low potential)*
Tertiary non-marine (Tc)[1]	Vertebrates, invertebrates, plants, ichnofossils	Tertiary (Miocene-Pliocene)	Class 2 *(low potential)*
Alluvium (Qoa)	Vertebrates, invertebrates, plants, ichnofossils	Quaternary (Pleistocene)	Class 3a *(moderate potential)*

NOTES:
1 Not mapped within Project area, but mapped within 1 mile of Project area boundary
2 Fossils documented in volcaniclastic deposits interbedded with this unit during field survey

SOURCE: Walker et al., 2002

[1] "Quaternary" is the term used to describe the period of Earth's history from 2.6 million years ago to the present time. "Alluvium" describes earth materials that have been put in place by the action of water on the earth's surface, such as sand deposited by a stream.

No previously recorded fossil localities are located within the Project site, although fossils are known to occur within stratigraphically correlative units elsewhere in the Mojave Desert. No fossils were documented within the requested ROW boundary during the field survey (PaleoResource Consultants, 2009). Four fossil localities were documented outside of the Project site, but these produced fossils that do not meet the BLM's significance criteria including poorly preserved burrow and root casts, and unidentifiable bone fragments (PaleoResource Consultants, 2009).

3.12.3 Applicable Laws, Regulations, Plans, and Standards

3.12.3.1 Federal

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA) (16 USC §470aaa et seq.), part of the Omnibus Public Land Management Act, directs the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land using "scientific principles and expertise." PRPA incorporates most of the recommendations of the report of the Secretary of the Interior entitled Assessment of Fossil Management on Federal and Indian Lands (2000) in order to formulate a consistent paleontological resources management framework. In passing the PRPA, Congress officially recognized the scientific importance of paleontological resources on some federal lands by declaring that fossils from these lands are federal property that must be preserved and protected. The PRPA codifies existing policies of the BLM, NPS, U.S. Forest Service, Bureau of Reclamation, and USFWS, and provides the following:

1. Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands;
2. Uniform minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants);
3. Uniform definitions for "paleontological resources" and "casual collecting;" and
4. Uniform requirements for curation of federal fossils in approved repositories.

BLM Paleontological Resources Management Policies

The BLM has developed general procedural guidelines (Manual H-8720-1; Instructional Memorandum [IM] 2008-009; IM 2009-011) for the management of paleontological resources (BLM, 2007, 2008). Paleontological resource management objectives include the evaluation, management, protection, and location of fossils on BLM-administered lands. Management policy also includes measures to ensure that proposed land uses do not inadvertently damage or destroy scientifically significant paleontological resources.

3.12.3.2 State

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that potential effects to paleontological resources are identified and analyzed, and that potential alternatives or mitigation measures are identified if potential impacts are determined to be significant.

Other state requirements for paleontological resources management are set forth in Public Resources Code Chapter 1.7 (Pub. Res. Code §§5097-5097.7), which governs archaeological, paleontological, and historical sites. This statute defines any unauthorized disturbance or removal of a fossil site or fossil remains on public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources (Pub. Res. Code §5097.5). This statute would apply to any portion of the Project subject to the jurisdiction of the State, potentially including trenching beneath Caltrans's ROW.

3.12.3.3 Local

San Bernardino County Paleontological Resources Sensitivity

The Project site would not be located within areas of known important paleontological resources, as mapped by San Bernardino County (2007).

3.12.4 Analytical Methodology

This analysis of potential effects of the Proposed Action and alternatives on paleontological resources is based on a review of relevant literature and site-specific information provided by the Applicant. The study area used for the analysis of potential effects of the Proposed Action and alternatives on paleontological resources includes the zone of expected surface disturbance from the Project, and the stratigraphic context in which fossils are located. The results of the literature and records search and the paleontological resources survey are presented in the following report:

> PaleoResource Consultants, 2009. *Paleontological Resource Survey of Portions of The Soda Mountains, San Bernardino County, California*, prepared for the BLM, Barstow Field Office, September

To assess the potential paleontological productivity of each geologic unit present, published and available unpublished geological and paleontological literature was reviewed, and stratigraphic and paleontologic inventories were compiled, synthesized, and evaluated. Geologic maps and reports covering the bedrock and surficial geology of the Project vicinity were reviewed to determine the exposed and subsurface rock units, to assess the potential paleontological productivity of each rock unit, and to delineate their respective areal distribution in the Project site and surrounding area. Museum records searches were conducted at the University of California Museum of Paleontology (UCMP) at Berkeley, the San Bernardino County Museum (SBCM), and the Natural History Museum of Los Angeles County (LACM) in order to determine whether any of the geologic units present within the Project site and vicinity previously have yielded significant paleontological resources. In addition, aerial photographs were examined to aid in determining the areal distribution of distinctive sediment and soil types. A field survey was conducted between July 19 and 23, 2009, to document the presence of bedrock and surficial sediments suitable for containing fossil remains and to document previously unrecorded fossil localities. No subsurface exploration was conducted for this assessment. Results of this research was used to assign Potential Fossil Yield Classification (PFYC) rankings to the geologic units within the Project site and surrounding area in accordance with BLM protocol (BLM, 2007, 2008).

The greater the amount of disturbance to paleontologically sensitive geologic formations (rocks and sediments), the greater the likelihood of adverse impacts to scientifically significant paleontological resources. Because the field survey that was completed in July 2009 did not identify any surface resources, it is assumed that no scientifically significant fossils remain on the ground surface within the Project site. Over time, fossils may erode onto the surface in areas with paleontological potential, so it should not be assumed that future ground disturbing projects in the area will not disturb scientifically significant fossils. Furthermore, it is assumed that scientifically significant fossils may be located under the ground surface in areas with paleontological potential and, although their specific locations cannot be determined, the potential for adverse effects resulting from Project related ground disturbing actions correlates with the paleontological sensitivity rankings of the geologic formations within the Project area as determined using the PFYC system (BLM, 2007).

This effects analysis is based on a comparison of the acreage of Project related surface disturbance under each alternative in paleontologically sensitive geologic units. The greater the acreage of surface disturbance in geologic units with paleontological potential (PFYC Classes 3 through 5), the greater the potential for adverse effects on scientifically significant subsurface fossils. Conversely, lesser amounts of disturbance in these same geologic units have a lower potential for adverse effects to scientifically significant subsurface fossils. The analysis is a two dimensional approach that does not take into account depth (volume of subsurface disturbance), only areal (lateral) extent. Although the probability of encountering paleontological resources is low in most of the Project site and surrounding area (see Table 3.12-1), the Quaternary alluvium that forms the ground surface in most of the Project site may be underlain at a shallow depth by older sedimentary and volcanic rocks that, when formed or deposited, may have buried organisms' bodies and captured their impressions as fossils (see Section 3.12.1 and PaleoResource Consultants, 2009).

For the CEQA portion of the analysis, although neither CEQA nor the CEQA Guidelines define "a unique paleontological resource or site," Public Resources Code Section 21083.2 defines "unique archaeological resources" as:

> …any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> a. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
>
> b. It has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> c. Is directly associated with a scientifically recognized important prehistoric or historic event.

With only slight modification, this definition is equally applicable to recognizing "a unique paleontological resource or site." Additional guidance is provided in CEQA Guidelines Section 15064.5(a)(3)(D), which states, "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history."

For this analysis, paleontological resources are considered to be significant if they:

1. Provide important information on the evolutionary trends among organisms, relating living organisms to extinct organisms;
2. Provide important information regarding development of biological communities or interaction between botanical and zoological biota;
3. Demonstrate unusual circumstances in biotic history; or
4. Are in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic localities.

3.12.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address paleontological resources.

3.12.6 Direct and Indirect Effects

3.12.6.1 Alternative A: Proposed Action

The Project would have direct impacts on paleontological resources if it resulted in breakage and crushing as the result of disturbance to fossils that have eroded onto the surface and subsurface rocks and sediments in which fossils are entombed. Indirect effects could result from increased access to paleontological resources by construction personnel and recreational users of public lands as the result of Project-related construction, leading to vandalism and unauthorized collection (theft) of resources.

The Project site is underlain by geologic units with low or very low potential to contain paleontological resources (PFYC Class 1 and 2). Therefore, the likelihood of adverse effects on significant paleontological resources is generally low, although the proposed realignment of Rasor Road would cross 2.21 acres of moderately paleontologically sensitive older alluvium (PFYC Class 3a), which has the potential to contain scientifically significant fossils of Pleistocene age that could be adversely affected during construction.

However, as the precise depth of subsurface disturbance required for construction cannot be determined until final Project design, and the depth of subsurface fossiliferous units is not known, it is not possible to definitively analyze the potential for adverse effects on subsurface paleontological resources within the Project site, and so it is assumed that adverse effects could occur during subsurface excavation. Mitigation Measure 3.12-1 requires that when engineering design plans and geotechnical data are available after implementation of Mitigation Measure 3.7-2 in Section 3.7, *Geology and Soil Resources*, subsurface geology and its paleontological potential be evaluated prior to construction, and if necessary, that the Applicant implement paleontological monitoring during ground-disturbing work. Additionally, implementation of Mitigation Measures 3.12-2 through

3.12-4, which require construction employee training, excavation monitoring as appropriate, and avoidance of potential fossils, for known fossil sites and unknown subsurface fossil sites would ensure that potential adverse impacts on paleontological resources within the requested ROW boundary would be minimized. This includes collecting or avoiding scientifically significant fossils located on the ground surface and monitoring construction excavations in rocks and sediments with the potential to contain subsurface fossils so that they can be salvaged when they are uncovered. With the implementation of mitigation, impacts on paleontological resources under the Proposed Action would be minimized.

3.12.6.2 Alternative B

The Alternative B Rasor Road realignment would cross approximately 32.5 acres of moderately sensitive older alluvium (PFYC Class 3a), which has the potential to contain scientifically significant fossils of Pleistocene age that could be adversely affected during construction. Therefore, the Alternative B route for Rasor Road has a higher potential than that of the Proposed Action to adversely affect significant paleontological resources. With respect to other Project components, effects would be similar to the Proposed Action, but reduced in proportion to the reduced size of the Project, as described in Section 2.5.1.

3.12.6.3 Alternative C

The effects of Alternative C would be similar to the Proposed Action, but reduced in proportion to the reduced size of the Project, as described in Section 2.5.2. This alternative would include the potential effects related to the disturbance of approximately 2.21 acres of moderately paleontologically sensitive older alluvium (PFYC Class 3a) associated with the realignment of Rasor Road. This older alluvium has the potential to contain scientifically significant fossils of Pleistocene age that could be adversely affected during construction.

3.12.6.4 Alternative D

The effects of Alternative D would be similar to the Proposed Action, but reduced in proportion to the reduced size of the Project, as described in Section 2.5.3. Because this alternative does not propose a realignment of Rasor Road, no portion of this alternative would disturb areas within PFYC Class 3a or higher.

3.12.6.5 Alternative E: No Action/No Project

There would be no adverse effects on significant paleontological resources as a result of the No Action/No Project Alternative because no Project-related surface disturbance would take place.

3.12.6.6 Alternative F: CEQA No Project

Because no wells would be constructed under this alternative, less subsurface disturbance would occur to the Quaternary alluvium (PFYC Class 2) on which the Proposed Action wells would be located. This would result in a reduced potential to adversely affect significant paleontological

resources. All other Project-related surface disturbance under the action alternative approved by the BLM (i.e., the Proposed Action or Alternatives B, C, or D) could occur as described above, including the disturbance of Quaternary older alluvium associated with the realignment of Rasor Road, as applicable.

3.12.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

There would be no adverse effects on paleontological resources as a result of this alternative because no Project-related surface disturbance would take place.

3.12.7 Cumulative Effects

Cumulative effects on paleontological resources involve the loss of non-renewable scientifically important fossils and associated data, and the incremental loss to science and society of these resources over time. Energy development projects, as well as commercial and residential development projects, have resulted in cumulative conditions affecting paleontological resources elsewhere in the Mojave Desert. However, the implementation of paleontological mitigation measures during surface disturbing actions has resulted in the salvage and permanent preservation of large numbers of scientifically significant paleontological resources that would otherwise have been destroyed. This has greatly reduced the cumulative effects of such projects on paleontological resources, and has resulted in the beneficial cumulative effect of making these fossils available for scientific research and education by placing them in museum collections.

The geographic extent for the cumulative effects analysis includes the requested ROW boundary, including the geologic units (bedrock and surficial sedimentary deposits) within it that could be affected by the Project and, more generally, the valley in which the Project is proposed because the natural boundaries of the potentially affected resources could extend beyond the requested ROW boundary. Existing conditions, for purposes of this analysis of potential cumulative effects to paleontological resources, are described in Section 3.12.2, Regional and Local Environmental Setting. Briefly, the Project site is largely undeveloped and the requested ROW boundary contains approximately 2.2 acres of paleontologically sensitive older alluvium; the site is considered to have little paleontological sensitivity. The Proposed Action could contribute to adverse cumulative effects on paleontological resources at any point during construction, operation and maintenance, or decommissioning and site reclamation that involves surface disturbance.

The limited effects of the Proposed Action and other alternatives on paleontological resources are described and analyzed in Section 3.12.5. To summarize, the requested ROW boundary contains areas with low or very low paleontological potential, but construction excavations could disturb underlying sediments of unknown depth that have higher paleontological potential (see Section 3.12.6). Surface disturbance associated with the Applicant’s proposed Rasor Road realignment under the Proposed Action and Alternative C, and the alternative Rasor Road realignment under Alternative B also could affect moderately sensitive areas directly underlain by Quaternary Older Alluvium (see Figure 3.12-1 and published geologic mapping in Walker et al., 2002).

As shown in Table 3.1-3, two projects would be constructed within the general Project area: the XpressWest High Speed Rail and Calnev Pipeline Expansion projects. These linear projects would parallel I-15 within the valley in which the Project is proposed and would pass through the same unit of Quaternary Older Alluvium as the Rasor Road realignment. The XpressWest alignment through this soil unit would be within the corridor of I-15, and therefore was determined likely to be developed within the previously disturbed area associated with the freeway; however, mitigation measures requiring full-time paleontological monitoring, a stop-work order if fossil materials are found, and fossil recovery and curation would be implemented during disturbance within this Quaternary Older Alluvium (FRA, 2009, 2011). The Calnev pipeline would be constructed within a 100-foot-wide ROW, and therefore could disturb land within a 100-foot-wide strip through the same unit of Quaternary Older Alluvium. That project also would implement mitigation measures to address impacts on paleontological resources, including construction monitoring in areas with PFYC designations 3, 4, and 5 (which would include the Quaternary Older Alluvium, which has a PFYC of 3a) and identification and curation of fossils (BLM and San Bernardino County, 2012). The potential for adverse cumulative effects to paleontological resources from these projects in this location is expected to be low based on the application of the proposed mitigation measures.

3.12.8 Mitigation Measures

In paleontologically sensitive areas, the objective of implementing mitigation measures is to reduce adverse effects on paleontological resources by recovering fossils and associated contextual data prior to and during ground-disturbing activities. Paleontological mitigation measures can result in a beneficial impact when scientifically important fossils and associated data are housed in perpetuity and made available for educational purposes and scientific research in an accredited and federally approved museum.

Mitigation Measure 3.12-1: Prior to construction, design plans shall be compared with geotechnical data and foundation design requirements compiled under Mitigation Measure 3.7-2 to determine whether the subsurface geology has a higher paleontological sensitivity than the surface geology, and whether construction will disturb the underlying higher sensitivity geologic units. If disturbance will occur, then monitoring of construction excavations in the disturbance areas shall take place in order to reduce potential adverse effects on significant paleontological resources.

Mitigation Measure 3.12-2: Prior to construction, a training session on the recognition of the types of paleontological resources that could be encountered within the requested ROW boundary and the procedures to be followed if they are found shall be presented to Project personnel by a qualified and BLM-permitted professional paleontologist.

Mitigation Measure 3.12-3: Based on the results of the field survey (PaleoResource Consultants, 2009) and in accordance with the BLM's paleontological resource management policies, monitoring shall take place in all areas where excavations that disturb older alluvium will occur during any Project phase. The monitoring program shall be designed and implemented by a qualified and BLM-permitted professional paleontologist. All scientifically significant fossils salvaged during construction monitoring shall be prepared to the point of curation, identified to element and the lowest possible

taxonomic level, and transferred to the San Bernardino County Museum for permanent storage. The results of the paleontological monitoring program, including an itemized inventory of salvaged fossils, shall be detailed in a Final Paleontological Monitoring Report prepared according to BLM policy (BLM, 1998, 2008).

Mitigation Measure 3.12-4: If any potential fossils are discovered during construction, operation and/or maintenance activities, or during decommissioning, the fossils shall be left undisturbed, and the BLM Authorized Officer shall be notified immediately.

3.12.9 Residual Effects

Implementation of the mitigation measures identified in Section 3.12.8 would reduce potential adverse effects on scientifically significant paleontological resources. Such mitigation measures have been proven to be effective in reducing adverse effects on fossils resulting from surface disturbing projects on BLM-administered land throughout the western United States. However, even in the most effective paleontological mitigation monitoring program, inadvertent damage to paleontological resources can occur at the point at which the fossils are uncovered by excavation equipment, and, in cases in which fossils are not identified by paleontological monitors, during excavation. Unless a fossil is destroyed, damage caused by construction equipment typically can be repaired in a paleontological laboratory. Implementation of the mitigation measures themselves is not expected to result in any impacts.

3.12.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G, Section V, a project would have a significant impact on paleontological resources if it would:

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

The remaining significance criteria identified in Section V of CEQA Guidelines Appendix G, i.e., criteria a, b, and d, relate to cultural resources and are addressed in Section 3.6.10 of this PA/EIS/EIR.

3.12.10.1 Alternative A: Proposed Action

c) Impact Paleo-1: The Project could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance. (Less than Significant with Mitigation Incorporated)

Due to the low paleontological potential (PFYC Class 1 and 2) of the geologic units within the proposed array areas, the likelihood of directly or indirectly destroying a unique paleontological resource or site is considered low. However, the Applicant's proposed realignment of Rasor Road would cross approximately 2.2 acres of older alluvium with moderate potential (PFYC Class 3a); the likelihood of directly or indirectly destroying a unique paleontological resource or site in this area is considered moderate. The destruction of a unique paleontological resource or site or unique geologic feature, if it occurs, would be a significant adverse impact. This potentially significant impact would be reduced to a less-than-significant level through implementation of

Mitigation Measures 3.12-1 through 3.12-4. This less-than-significant, Project-specific impact would not be cumulatively considerable for the reasons discussed in Section 3.12.6.

3.12.10.2 Alternative B

c) Impact Paleo-B1: Alternative B could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance. (Less than Significant with Mitigation Incorporated)

Due to the low paleontological potential (PFYC Class 1 and 2) of the geologic units within the proposed array areas, the likelihood directly or indirectly destroying a unique paleontological resource or site is considered low. The Alternative B Rasor Road realignment would cross approximately 32.5 acres of moderately sensitive older alluvium (PFYC Class 3a), which has moderate potential for directly or indirectly destroying a unique paleontological resource or site. Therefore, the Alternative B route for Rasor Road has a higher likelihood than the proposed route to directly or indirectly destroy a unique paleontological resource or site. This potentially significant impact would be reduced to less than significant through implementation of Mitigation Measures 3.12-1 through 3.12-4. The less-than-significant, Alternative B-specific impact would not be cumulatively considerable for the reasons discussed in Section 3.12.6.

3.12.10.3 Alternative C

c) Impact Paleo-C1: Alternative C could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance. (Less than Significant with Mitigation Incorporated)

The effects of Alternative C would be similar to the Proposed Action, but reduced in proportion to the reduced size of the solar facility. This alternative would include the potential effects related to the disturbance of approximately 2.2 acres of moderately paleontologically sensitive older alluvium (PFYC Class 3a), which has the potential to contain scientifically significant fossils of Pleistocene age that could be adversely affected during construction. The significance of this impact would be reduced compared to the Proposed Action but would remain significant unless and until Mitigation Measures 3.12-1 through 3.12-4 are implemented. With the implementation of these mitigation measures, Impact Paleo-C1 would be less than significant. The less-than-significant, Alternative C-specific impact would not be cumulatively considerable for the reasons discussed in Section 3.12.6.

3.12.10.4 Alternative D

c) Impact Paleo-D1: Alternative D could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance. (Less than Significant with Mitigation Incorporated)

The effects of Alternative D would be similar to the Proposed Action, but reduced in proportion to the reduced size of the solar facility. This alternative would avoid the potential effects related to the disturbance of moderately paleontologically sensitive older alluvium (PFYC Class 3a), because it would not include the Rasor Road realignment and therefore would not disturb any

areas of sensitive older alluvium. However, it still could result in direct or indirect destruction of unknown paleontological resources within the disturbed areas of the solar plant site. The significance of this impact would be reduced compared to the Proposed Action but would remain less than significant with implementation of Mitigation Measures 3.12-1 through 3.12-4. The less-than-significant, Alternative D-specific impact would not be cumulatively considerable for the reasons discussed in Section 3.12.6.

3.12.10.5 Alternative E: No Action/No Project

c) Alternative E would not directly or indirectly destroy unique paleontological resources or sites. (No Impact)

Under this alternative, no ground disturbance would occur, and therefore no unique paleontological resources or sites or unique geologic features would be destroyed. This alternative would not cause or contribute to a cumulative effect on paleontological resources.

3.12.10.6 Alternative F: CEQA No Project

c) Impact Paleo-F1: Alternative F could directly or indirectly destroy unique paleontological resources or sites if they occur within the extent of Project-related ground disturbance. (Less than Significant with Mitigation Incorporated)

Because no wells would be constructed under this alternative, less subsurface disturbance would occur, resulting in a reduced potential to adversely affect significant paleontological resources. However, all other Project-related surface disturbance under the action alternative approved by BLM (i.e., the Proposed Action or Alternatives B, C, or D) could occur as described above, and its impacts would similarly be less than significant with implementation of Mitigation Measures 3.12-1 through 3.12-4. These less-than-significant impacts would not be cumulatively considerable for the reasons discussed in Section 3.12.6.

3.12.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

c) Alternative G would not directly or indirectly destroy unique paleontological resources or sites. (No Impact)

Under this alternative, no ground disturbance would occur, and therefore no unique paleontological resources or sites or unique geologic features would be destroyed. This alternative would not cause or contribute to a cumulative effect on paleontological resources.

References

Bureau of Land Management (BLM), 1998 (revised). *Paleontology Resources Management Manual and Handbook*, H-8270-1.

BLM, 2007. *Potential Fossil Yield Classification System*, BLM Instruction Memorandum No. 2008-009 (PFYC revised from USFS, 1996).

BLM, 2008. *Assessment and Mitigation of Potential Impacts to Paleontological Resources,* BLM Instruction Memorandum No. 2009-011.

Federal Railroad Administration (FRA), 2009. DesertXpress High Speed Passenger Rail Project Draft EIS, Section 3.7, Cultural and Paleontological Resources.

FRA, 2011. DesertXpress High Speed Passenger Rail Project Final EIS, Section 3.7, Cultural and Paleontological Resources.

PaleoResource Consultants, 2009. *Paleontological Resource Survey of Portions of The Soda Mountains, San Bernardino County, California*, prepared for the BLM, Barstow Field Office, September.

San Bernardino County, 2007. Paleontological Resources Sensitivity Overlay (GIS data).

Secretary of the Interior, 2000. Assessment of Fossil Management on Federal and Indian Lands. May. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/coop_agencies/paleontology_library/paleon_legis.Par.15714.File.dat/fossil.pdf]

Walker, J. D., Berry, A. K., Davis, P. J., Andrew, J. E., and Mitsdarfer, J. M., 2002a. *Geologic map of northern Mojave Desert and southwestern Basin and Range, California: compilation and methods.* Geological Society of America Memoir 195, p. 295-296.

Walker, J. D., Berry, A. K., Davis, P. J., Andrew, J. E., and Mitsdarfer, J. M., 2002b. *Geologic map of northern Mojave Desert and southwestern Basin and Range, California*. Geological Society of America Memoir 195 (scale 1:250,000).

This page intentionally left blank

3.13 Recreation

3.13.1 Introduction

The following discussion addresses existing recreational resources within the general vicinity of the Project and describes existing laws and regulations relevant to those resources. For the purposes of the analysis in this section, the "general vicinity" has been defined as the area within 10 miles of the Project site. This study area was selected to consider potential impacts to recreation because it captures all major recreation resources that contribute to baseline conditions and that have the potential to be affected by activities related to the Project.

For the purpose of this section, the terms o*ff-road vehicles* and *off-highway vehicles* (OHV) are used interchangeably (OHV is the term most used in BLM and other federal land use planning).

3.13.2 Regional and Local Environmental Setting

3.13.2.1 Recreation Resources on the Project Site

The valley in which the Project site is located contains industrial infrastructure. This includes I-15, which dominates the landscape through the center of the Project site. Two high-voltage transmission lines, an electrical distribution line, two petroleum product pipelines, and a fiber optic cable parallel the north side of the I-15 (Caithness Soda Mountain, LLC, 2011). Two interstate interchanges provide access to the public lands immediately adjacent to the Project site; Zzyzx Road (Exit 239) and Rasor Road (Exit 233). A commercial highway service center at the Rasor Road Exit provides fuel, towing, telephone, and a convenience store to highway and public land visitors. The entire Project site is within sight and sound of I-15.

The Project site and immediate vicinity are used for "dispersed recreation use." Dispersed areas are areas that do not contain developed or "managerially significant" recreation sites or attractions. "Managerially significant" sites and areas are locations where the BLM has determined that "management actions are required to provide specific recreation setting or activity opportunities, to protect resource values, or to enhance visitor safety." Visitation estimates in dispersed areas are generally best estimates based on local knowledge (BLM, 2012a).

The BLM has no estimate of recreation visitor use in the immediate vicinity of the Project, but this is estimated to be low due to the proximity to I-15 transportation and utility corridor and lack of recreation facilities and major attractions. Open routes for vehicles are located within and adjacent to the Project site, with the most significant route being the access to Rasor OHV Special Recreation Management Area (SRMA) (commonly called Rasor OHV Recreation Area) from the Rasor Road exit from I-15. See Section 3.13.2.3, *Public Access*, for more details on OHV Open routes in the immediate vicinity of the Project. Other than vehicle traffic on the open routes through and immediately adjacent to the Project, recreational use of the Project site is limited.

3.13.2.2 Recreation Resources Surrounding the Project Site

The NPS and BLM are the primary recreational opportunity providers in the general vicinity of the Project. While each agency manages a unique set of recreational opportunities for desert visitors, the NPS facilities attract the vast majority of recreation visitors in the region. Table 3.13-1 provides a comparison of visitor use data for the distinct management units that will be discussed in this chapter. These resources are shown in Figure 3.13-1.

TABLE 3.13-1
REPORTED RECREATION VISITS TO FEDERAL AREAS IN VICINITY OF PROJECT
FISCAL YEAR 2011

Unit	Acres	Recreation Visits
Mojave National Preserve (NPS)	1.6 million	584,421
Rasor OHV Special Recreation Management Area (BLM)	24,959	6,341
Afton Canyon Special Recreation Management Area (BLM)	43,363	13,926
Soda Mountain Wilderness Study Area	80,430	no visitor use estimate

NOTE: The BLM reports recreation visits on a fiscal year (October-September) basis. NPS reports recreation visits on monthly and calendar year bases. NPS monthly data has been converted to FY2011 time period for purposes of comparison.

SOURCES: NPS, 2013a; BLM, 2010a, 2012b, 2012c

National Park Service

The NPS is responsible for the management of the 1.6 million-acre Mojave National Preserve, which was established by the 1994 California Desert Protection Act. The preserve is a vast expanse of desert lands that represent a combination of Great Basin, Sonoran, and Mojave desert ecosystems. Approximately 700,000 acres of the preserve is designated Wilderness. Recreational activities within the preserve include camping, picnicking, hiking, visiting historical sites, nature study, attending interpretative programs, and stargazing (NPS, 2002). The majority of the recreation visitors access the center of the preserve from Interstates 15 and 40 via Kelbacker, Cima, and Essex roads (NPS, 2013b).

Major recreation facilities in the preserve are the Kelso Depot Visitor Center, Hole in the Wall Information Center, Hole in the Wall Campground, Mid Hills Campground, and Black Canyon Group and Equestrian Campground. These facilities are more than 30 miles from the Project site and are outside the study area for this analysis.

The preserve is located within 0.5 mile of the northeast end of the proposed north array, near the Zzyzx Road exit from I-15. South of I-15, Zzyzx Road extends approximately 5 miles within the preserve, ending at historic Zzyzx, which is currently in use by California State University as its Desert Studies Center. Soda Dry Lake, within Mojave National Wilderness, is bordered on the west by this portion of Zzyzx Road. Recreation facilities at Zzyzx include parking, a self-guided tour around Lake Tuendae, wayside exhibits, vault toilets, and a picnic area. NPS does not report visitor use estimates for this portion of the preserve (NPS, 2013c).

Bureau of Land Management

The types of recreational uses that are allowed on public lands in the general vicinity of the Project are governed by the CDCA Plan (BLM, 1999) and the WEMO Plan Amendment (discussed further in Section 3.13.2.3) (BLM, 2006). The BLM Barstow Field Office is responsible for the management of this portion of the California Desert District. A variety of distinct management areas are located within the study area for this analysis, including two SRMAs, two Wilderness Study Areas (WSAs), and two ACECs. SRMAs are recreation sites and other specific areas on public lands directly managed by the BLM that are recognized as "managerially significant." Visitation estimates at these areas are based on a variety of methods, including sampling, fee receipts, registrations, traffic counts, observations, or best estimates based on local knowledge (2012a).

The closest SRMA to the Project is the Rasor OHV SRMA (commonly referred to as Rasor OHV Recreation Area) immediately south and less than 1 mile from the Project site. The second is the Afton Canyon SRMA, of which the eastern portion at Cave Mountain is approximately 4 miles from the Project site. See Figure 3.13-1. Primary recreational activities within the Rasor OHV Area include driving and touring with motorcycles, all-terrain vehicles, sand rails, and four-wheel drive vehicles. In addition, there are opportunities for hiking, rock scrambling, rockhounding (study and collection of minerals), botany, and wildlife viewing. Primitive camping is allowed in the recreation area. In addition to the Rasor Road access (I-15, Exit 233), OHV users also are able to access the recreation area via Basin Road (I-15, Exit 230) (BLM, 2010b). The Afton Canyon SRMA (which includes Afton Canyon Natural Area, an ACEC) offers developed recreational campground and picnic facilities. The primary activities in this SRMA include hiking, hunting, camping, nature study, rockhounding, horseback riding, vehicle touring, and astronomy. However, visitor use at this SRMA is concentrated at Afton Canyon Campground, approximately 12 miles from the Project site. The primary access to Afton Canyon recreation facilities is from I-15, Exit 222. This is the closest developed BLM recreation facility to the Project (BLM, 2013).

Soda Mountain Wilderness Study Area (WSA) is another distinct BLM management area adjacent to the Project site, located less than 0.5 mile from the northwest boundary. Additionally, Cady Mountains WSA is located 8 miles from the Project site. The Cronese Lakes and Mesquite Hills/Lucero Hills ACECs are located approximately 3.5 miles and 5.8 miles from the Project site, respectively. However, none of these WSAs or ACECs is a SRMA, and no special management prescriptions for recreation purposes are in effect; instead, all are managed as dispersed recreation areas. No recreation visitor estimates are available for these areas. Section 3.15, *Special Designations*, provides additional discussion of these WSAs and ACECs.

State and Local

No State of California Recreation Area or San Bernardino County Regional Park is located in the study area. The closest local recreational facility is Chet Hoffman Park located in Baker, California. This facility, operated by the Baker Community Services District (BCSD), provides playgrounds, sports fields, and a community hall for the residents of Baker. The facility is located approximately 7 miles from the Project site. (BCSD, 2013)

3.13.2.3 Public Access

The Rasor Road and Zzyzx Road exits from I-15 provide the primary access routes to the Project site and BLM and NPS areas adjacent to the Project site. From these roads, there is a small network of travel routes through and adjacent to the site. Zzyzx Road provides the only vehicle access to NPS-administered lands in the general vicinity of the Project.

From I-15 (Exit 230) recreational users can travel south on Basin Road to Rasor OHV Recreation Area, Mojave Road, and the east end of Afton Canyon SRMA. No recreational facilities are provided along this route. Traveling north from Exit 230, recreational users can access Cronese Lakes ACEC. No recreational facilities are provided on this route.

From I-15 (Exit 221), Afton Canyon Road is the primary access to Afton Canyon SRMA and Afton Canyon Campground. The Afton Canyon Campground is the closest BLM visitor facility to the Project site, a direct distance of approximately 12 miles.

On BLM-administered lands in the CDCA, travel routes are classified as Open, Limited, or Closed with the following definitions:

1. ***Open Route:*** Access by motorized vehicles is allowed.
2. ***Limited Route:*** Access by motorized vehicles is limited to use by number of vehicles, type of vehicle, time or season, permitted or licensed, or speed limits.
3. ***Closed Route:*** Access by motorized vehicles is prohibited except for authorized use.

The WEMO Plan Amendment, adopted in March 2006, was prepared specifically to develop a comprehensive strategy for the protection of sensitive plants and animals and resulted in the establishment of eight Travel Management Plans to establish new route designations for vehicles. The Project site is located in two separate Subregion Travel Management Areas (TMAs): Afton Canyon (TMA1) and Cronese (TMA5). The new route designations for these TMAs have been completed (BLM, 2013).

For each TMA, maps have been published that include the current legal motorized road and trail network in limited use areas on BLM-administered lands in the West Mojave Planning Area (BLM, 2011a, 2011b). Motorized use is permitted only on routes signed “Open.” Motorized use of any closed route is punishable by fine or criminal prosecution (BLM, 2013).

TMA1 contains the portion of the Project site south of I-15. Two Open routes are located within or immediately adjacent to the boundaries of the proposed South Array: AC8828 and AC8826. An unnumbered remnant of the Arrowhead Trail Highway is also located in this portion of the Project site and is a designated as a closed route. Table 3.13-2 provides additional information about vehicle routes near the Project site, shown in Figure 3.13-1 (BLM, 2012d).

TMA5 contains the portion of the Project site north of I-15. Five Open routes provide access through and around the Project site: CL8837, CL8839, CL8841, CL8845, and CL8847. There are also several Closed routes in the vicinity of the Project site (BLM, 2012e).

TABLE 3.13-2
VEHICLES ROUTES IN THE IMMEDIATE VICINITY OF THE PROJECT SITE

Route Identification	Description of Vehicle Routes
AC8826	Originates at I-15, Exit 233, and is a less than 1-mile dead end route to an area behind Rasor Services. The route is outside of the requested ROW boundary at the southwest corner of the proposed South Array, located near the proposed Operation and Maintenance Buildings.
AC8828 (Rasor Road)	Originates at I-15, Exit 233, is the primary access route to Rasor OHV Recreation Area, and traverses through the center of the proposed South Array for approximately 3 miles. The segment of AC8828 between I-15 Exit 233 and an intersection of a Limited route at T. 12 N., R.7E., Sec 12, E½, San Bernardino Meridian, was once known as Arrowhead Trail Highway. There are no formal facilities along the route, but dispersed camping is allowed within the recreation area.
Arrowhead Trail Remnant	A remnant of the Arrowhead Trail continues from AC8828, branching at the location noted in AC8288, and continues northerly to I-15 is identified as a "Limited Route."
CL8837	A segment of the Arrowhead Trail Highway, originating the Zzyzx Road (North) is located approximately 0.5 mile northwest of I-15, Exit 233, paralleling I-15 between the interstate and the proposed North Array.
CL8839	A route originating on CL8847 which follows the existing 500 kv transmission line outside the northwest extent of the requested ROW boundary and the southeast boundary of Soda Mountain WSA. The route crosses the requested ROW boundary before it connects with CL8837.
CL8841	From I-15 (Exit 233), vehicles traveling north on open route CL 8841 can connect to vehicle routes (CL8846, CL8849, CL8845) situated between I-15 and the Soda Mountain WSA's southern boundary. No recreational facilities are provided on this route.
CL8845	A route known as the Opah Ditch Road, which connects routes CL8837 and CL8839 and passes through the Project site. The intersection of CL8845 and CL8839 is the location of the Project's proposed substation and collector route termini.
CL8847	Originates at I-15, Exit 239, is known as Zzyzx Road, and connects with CL8837 and CL8839. From I-15, CL8847 provides public access to the Soda Mountain WSA, Blue Bell Mine Road, and to vehicle routes (CL8846, CL8849, CL8845) that are situated between I-15 and the Soda Mountain WSA's southern boundary. No recreational facilities are provided along these routes.

3.13.3 Applicable Laws, Regulations, Plans, and Standards

3.13.3.1 Federal

The following summarizes the federal laws, plans, and standards that would apply to the areas with special designations on BLM-administered lands within the study area.

Federal Land Policy and Management Act

FLPMA establishes public land policy and guidelines for administration and provides for the management, protection, development, and enhancement of public lands such as would be subject to the requested ROW grant. Under FLPMA, the BLM is responsible for the development of energy resources on BLM-administered lands in a manner that balances diverse resource uses and that takes into account the long-term needs of future generations for renewable and non-renewable resources. Among those uses, FLPMA recognizes that the public lands should be managed in a manner that will provide for outdoor recreation.

California Desert Conservation Area Plan

The 25 million-acre CDCA contains over 12 million acres of public lands spread within the area known as the California Desert, which includes the following three deserts: the Mojave, the

Sonoran, and a small portion of the Great Basin. Approximately 10 million acres of the CDCA public lands are administered by the BLM. Lands within the Project site are designated Multiple-Use Classes L, M, and I under the CDCA Plan. Lands designated Class L are suitable for recreation that generally involves low to moderate user densities. Allowed recreation opportunities include backpacking, primitive camping, hiking, rockhounding, nature study, and similar low-intensity uses, as well as motorized vehicle touring on approved routes of travel. On Class M lands, in addition to Class L uses, recreation activities are allowed that may involve moderate to high user densities, such as competitive motorized vehicle events on existing routes of travel. The Class I designation allows all Class L and M uses, and allows OHV use in open areas.

West Mojave Plan Amendment

The WEMO Plan Amendment to the CDCA Plan covers an area of 9.3 million acres in the western portion of the Mojave Desert in southern California, covering parts of San Bernardino, Los Angeles, Kern, and Inyo counties. Among these are 3.2 million acres of public lands, including the Project site. The WEMO Plan Amendment was specifically prepared to develop a comprehensive strategy for the protection of sensitive plants and animals, and resulted in the establishment of the eight Travel Management Plans described above.

Mojave National Preserve General Management Plan

The NPS developed the General Management Plan in 2002 to guide the overall management strategy for the 1.6 million-acre Mojave National Preserve for a 10- to 15-year period. The plan focuses on the purposes of the preserve, its significant attributes, what activities are appropriate within specified constraints, resource protection strategies, and its mission in relation to the overall mission of the NPS (NPS, 2002).

3.13.3.2 State

No state regulations are applicable to recreational resources within the study area.

3.13.3.3 Local

No local regulations are applicable to recreational resources within the study area.

3.13.4 Analytical Methodology

This analysis of potential recreation-related effects of the Proposed Action and alternatives focuses on whether construction, operation and maintenance, and decommissioning activities would conflict with management goals regarding recreational use of and access to developed sites and dispersed areas in the study area. Known recreational uses in the vicinity of the Project site include but are not limited to camping, picnicking, hiking, hunting, horseback riding, OHV use and vehicle touring, star-gazing, wildlife viewing, and rockhounding.

Recreational facilities within 10 miles of the requested ROW boundary, i.e., within the study area, include a picnic area, wayside exhibits, a self-guiding trail, vault toilets, an OHV recreation area, primitive camping areas, and a community park.

This analysis analyzes the effects of the Proposed Action and alternatives relative to specific legislation and agency guidance documents that pertain to the designation and management of recreation on public lands including the FLPMA, CDCA Plan, WEMO Plan, and specific recreation area management plans that apply within the study area. Additional discussion related to recreation-related impacts may be found in Section 3.15, *Special Designations*, and Section 3.18, *Visual Resources*.

3.13.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including APM 32, which would address potential effects to traffic and recreational resources as follows:

> **APM 32:** The relocated segment of Rasor Road shall be completed and open to traffic prior to the permanent closure and decommissioning of the pre-Project (existing) location of Rasor Road.

3.13.6 Direct and Indirect Effects

The direct effects of the Project on recreation resources would relate primarily to impacts on the visitor experience on the journey from I-15 to the recreation sites and areas in the general vicinity of the Project site.

3.13.6.1 Alternative A: Proposed Action

Construction

The Project site currently is used primarily for access to recreational attractions adjacent to the Project. Open routes described in 3.13.5 and listed in Table 3.13.2 provide access to public lands on the north and south side of I-15. During construction, the Proposed Action may cause temporary disruption to public access for the Project site and adjacent public lands.

Zzyzx Road would remain open during construction; however, Project traffic using I-15 Exit 239 would affect visitors accessing this entrance to Mojave National Preserve as a result of increased noise, dust and visual disturbance. A remnant of the Arrowhead Trail also is located within the proposed South Arrays and would be inaccessible during construction. The presence of construction workers could also result in increased use of the facilities at the Desert Studies Center.

The Proposed Action would realign Rasor Road to follow the southernmost ROW boundary line. The realigned route would become the primary recreation access to Rasor OHV Recreation Area and for Project access into the South Array area. As proposed by APM 32, the relocated segment of Rasor Road would be completed and open to traffic prior to the permanent closure of the existing Rasor Road, and access to the Recreation Area via Rasor Road would not be disrupted. However, portions of Rasor Road would be shared with construction vehicles. Recreational visitors would be able to avoid Project construction activity by accessing Rasor OHV Recreation

Area using the Basin Road route. However, that access is not as convenient to the northerly end of the Recreation Area.

Other open routes on the north side of I-15 (CL8837, CL 8839, CL8841, and CL8845) are located within the proposed North Array near the substation and collector route facilities. Routes CL8841, CL8845, and CL8847 would remain open to the public during construction, but would be shared with construction vehicles. Routes CC8837 and CL8839 would be closed to the public during construction. Implementation of Mitigation Measure 3.13-1, which requires that up-to-date Travel Management Area maps be prepared and posted throughout the Project, would reduce impacts on users of open routes by clearly marking the current status of existing routes.

In addition to the public access impacts, other impacts to recreational experiences are expected in those special areas and recreation sites closest to the Project site, namely Soda Mountain WSA, Mojave National Wilderness at Soda Dry Lake, Rasor OHV Recreation Area, and the recreational facilities at Desert Studies Center. Recreational users traveling to and visiting these areas would likely be affected by the noise and fugitive dust of construction activities, as well as the visual impacts of construction activity.

Recreational use of areas further away from the Project site, namely Cronese Lakes ACEC, Cady Mountains WSA, Mesquite Hills/Lucero Hills ACEC, Afton Canyon ACEC, and the Old Spanish National Historic Trail (Main Route) are not expected to be affected by the Project. Afton Canyon Campground is not expected to experience increased day use or overnight use. The drive to the campground is approximately 16 miles from the Project, including 4 miles of rough, unpaved road. Also, the use of the campground requires a standard 14-day maximum camping limit, which would likely deter construction workers from using the campground for lodging.

The community facilities and recreational opportunities afforded at Chet Hoffman Community Park in Baker (primarily including playground structures and sports fields) are not likely to be affected by any phase of the Project because the park is located 7 miles from the Project site, which is too far for any direct effects due to air emissions or noise. No substantial additional recreational use by construction workers or their families is expected because, as described in Section 3.14, *Socioeconomics and Environmental Justice*, it is not expected that workers from outside the Project vicinity would permanently relocate with their families to communities closer to the Project site, such as Baker. Therefore, Project construction is not expected to increase the population of Baker and thereby increase the use of its facilities.

Further discussion of recreation related issues is included in Sections 3.2, *Air Resources;* 3.11, *Noise*; 3.16, *Transportation and Travel Management*, and 3.18, *Visual Resources*.

Operation and Maintenance

During operation and maintenance, the Project site would be fenced and recreational use of the Project site no longer would be possible. Visitor access to Rasor OHV Recreation Area, Mojave National Preserve, and Soda Mountain WSA would be maintained. The realigned Rasor Road would become the primary recreation access to Rasor OHV Recreation Area and for access into the proposed South Array area of the Project.

Though the Project is proposed within an existing transportation and utility corridor, it would significantly change the visual appearance and visitor experience along these primary access routes if it is constructed. However, the visual impacts would be minimal once visitors reach their destinations in Rasor OHV Recreation Area, Mojave National Preserve, and Soda Mountain WSA. See Section 3.18, *Visual Resources*, for additional details.

Open routes located within the Project site (as identified in Table 3.13-2) no longer would be available for public use.

No air quality or noise impacts to recreation are anticipated during the operation and maintenance phase. See Sections 3.2, *Air Quality*, and 3.11, *Noise*, for additional details.

Decommissioning

Decommissioning activities would cause temporary, indirect disturbances to users of the recreation areas similar to those described under "Construction." However, following the conclusion of decommissioning activities, some users may experience a slightly beneficial impact, as the site would be returned to its pre-Project condition and the road to Rasor OHV Recreation Area would be improved.

3.13.6.2 Alternative B

Alternative B would have essentially the same range of construction impacts as those identified for the Proposed Action. During the construction phase, this Alternative temporarily would disrupt the public's access to the Project site and adjacent public lands. However, with the BLM Proposed Rasor Road realignment and the elimination of the proposed North Array, the visual impact of the Project to visitors accessing Rasor OHV Recreation Area and Mojave National Preserve would be lessened.

Once constructed, visitors using Rasor Road would be diverted away from the Project boundary fence line. Except for a short exposure in the southeast corner of the Project site, as shown on Figure 2-8, this new alignment would eliminate views of the Project as a result of the topography between the Project and the road, and would reduce air and noise impacts on recreational users as a result of increased distance from Project construction activities.

Alternative B would have essentially the same range of operation and maintenance-related impacts as those identified for the Proposed Action. Recreational use of the Project site no longer would be possible; however visitor access to Rasor OHV Recreation Area, Mojave National Preserve, and Soda Mountain WSA would be maintained. An improved and maintained access route to Rasor OHV Recreation Area would be available for public use.

Decommissioning activities for Alternative B would cause temporary, indirect disturbances to users of the recreation areas similar to those described for construction of the Proposed Action. However, after decommissioning activities have concluded, users could experience a slightly beneficial impact because the site would be returned to its pre-Project condition and the road to Rasor OHV Recreation Area would be improved.

3.13.6.3 Alternative C

Alternative C direct and indirect construction-related impacts would be essentially the same as those of the Proposed Action. The elimination of the East Arrays under this Alternative would not substantially alter visitors' experience as they access recreation areas and sites in the vicinity.

Alternative C would have essentially the same range of operation and maintenance-related impacts as those identified for the Proposed Action. Recreational use of the Project site no longer would be possible; however, visitors' access to the Rasor OHV Recreation Area, Mojave National Preserve, and Soda Mountain WSA would be maintained.

Decommissioning activities for Alternative C would cause temporary, indirect disturbances to users of the recreation areas similar to those described for construction of the Proposed Action. However, after decommissioning activities have concluded, users could experience a slightly beneficial impact because the site would be returned to its pre-Project condition.

3.13.6.4 Alternative D

Alternative D would have essentially the same range of construction-related impacts as those identified for the Proposed Action. During the construction phase, this Alternative temporarily would disrupt the public's access to and through the Project site and adjacent public lands accessed by routes that would be temporarily closed.

The reduced size of the South Arrays and the use of the existing Rasor Road (AC 8828) would not substantially change the visitor experience for those accessing adjacent recreation sites and areas. Recreation visitors using Rasor Road would still be in close proximity to the South Arrays and maintenance facilities.

Alternative D would have essentially the same range of operation and maintenance-related impacts as those identified for the Proposed Action. Recreational use of the Project site would no longer be possible; however, visitors' access to the Rasor OHV Recreation Area, Mojave National Preserve, and Soda Mountain WSA would be maintained.

Decommissioning activities for Alternative D would cause temporary, indirect disturbances to users of the recreation areas similar to those described for construction of the Proposed Action. However, after decommissioning activities are completed, users could experience a slightly beneficial impact because the site would be returned to its pre-Project condition.

3.13.6.5 Alternative E: No Action/No Project

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the Groundwater Well Permit application. Because the Project would not be approved, no new structures or facilities would be constructed, operated and maintained, or decommissioned on the site, there would be no related ground disturbance or changes in recreational use patterns of the site or its vicinity. The BLM would continue to allow recreation uses consistent with the site's multiple use classification as described in the CDCA Plan.

Under Alternative E, there would be no adverse impact on recreation resources within or adjacent to the Project site.

3.13.6.6 Alternative F: CEQA No Project

Under Alternative F, the impacts to recreation resources would be the same as those described for the Proposed Action or other action alternative approved by the BLM plus the additional effects of potential traffic-related conflicts with recreational vehicles using the same roadways as the water trucks traveling to and from the Project site. Traffic and transportation-related impacts, including potential conflicts with recreational vehicles using the same roadways as the water trucks traveling to and from the Project site, are described and analyzed in Section 3.16.6.6. The extent to which water truck emissions could affect air quality on and along roadways shared with recreational users is described and analyzed in Section 3.2.5.6. Noise generated by the water trucks also could affect recreational users on and along shared roadways. The noise impacts of Alternative F are described and analyzed in Section 3.11.5.6. Headlights, taillights, and glint or glare associated with the water trucks are addressed in Section 3.18.6.6.

3.13.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project but would amend the CDCA Plan to identify the site as unsuitable for solar development, and the County would not approve the groundwater well permit application. Because the Project would not be approved, no new structures or facilities would be constructed, operated, maintained, or decommissioned on the site, and there would be no related ground disturbance or changes in recreational use patterns of the site or its vicinity. The BLM would continue to allow recreation uses consistent with the site's multiple use classifications as described in the CDCA Plan.

Under Alternative G, there would be no adverse impact on recreation resources within or adjacent to the Project site.

3.13.7 Cumulative Effects

The geographic extent of the cumulative effects analysis for recreational use of local and regional recreational facilities consists of CDCA lands that are conveniently accessible from I-15 and that are developed recreational sites, routes, SRMAs, or that have dispersed recreation opportunities because it is likely that recreationalists using lands within the study area could be displaced to another recreation location along I-15.

To determine the number, names, and locations of developed recreational sites, routes, and SRMAs conveniently accessible from I-15, the BLM identified all specially designated CDCA lands administered by the BLM Barstow and Needles field offices, and then tailored the list to include only those areas accessed primarily via I-15. Sites meeting these criteria are identified in Table 3.13-3.

To identify the locations within the CDCA that are conveniently accessible from I-15 and where dispersed recreation is allowed, this analysis reviewed all CDCA lands designated with the multiple use classifications of MUCs L, M, and I (as described in Section 3.9, Lands and Realty, the Project site includes these designations) and then, to avoid underestimating potential cumulative effects to dispersed recreation, narrowed the inquiry to MUC L, M, and I lands with direct access to I-15 (i.e., an on- and off-ramp) within 50 miles of Zzyzx Road (Exit 239) and 50 miles of Rasor Road (Exit 233), and then with a 50-mile radius of the exit. It is assumed that beyond 50 miles from the Project site exits, recreationalists would identify other recreational opportunities in lieu of longer travel distances. As stated in Section 3.9.6.4, there are approximately 4 million acres of Class L lands, 1.5 million acres of Class M lands, and 500,000 acres of Class I lands within the CDCA. Not all of these lands are conveniently accessible from I-15. The exits from I-15 within 50 miles north of Zzyzx Road and exits from I-15 within 50 miles south of Rasor Road (excluding the agricultural inspection station, which is accessible from the southbound direction only) are identified in Table 3.13-3.

Past and ongoing development within the vicinity of the Project, especially the development of facilities within the I-15 transportation and utility corridor, has resulted in alterations to the recreational use of the area, including effects on vehicle access, air quality, noise, and visual resources at adjacent recreation use areas. Permanent impacts to visual resources as viewed from these recreation use areas exist in varying degrees, depending on distance and topography. Any ongoing impacts of these past projects are reflected in the environmental setting. See, e.g., Section 3.13.2.

Table 3.1-3 provides a list of current and foreseeable projects, including other proposed or approved renewable energy projects such as the Silurian Valley Wind Project, which is a proposed wind energy project currently in the application process, and the approved XpressWest High Speed Passenger Rail project and proposed Calnev Pipeline Expansion project. Table 3.1-2 lists proposed renewable energy development within the CDCA. There are a total of 55,237 acres of renewable energy projects proposed in the Barstow and Needles field office regions, including the Proposed Action, many of which are within the area considered in this analysis of cumulative effects to recreation.

Known current, planned, or foreseeable projects in the area where cumulative effects to recreation could occur are not likely to contribute to changing the type of recreation opportunities in the area, but could affect the quality of recreation opportunities available in the area by changing public access or by affecting air resources (including truck exhaust odors and other emissions), ambient noise conditions, or visual resources in the area. Project-related contributions to potential cumulative effects would begin when Project-related vehicle begin using roadways that currently are used by recreational users and would continue until decommissioning activities for the Project are completed. The construction, operation and maintenance and decommissioning of projects in the cumulative scenario would contribute incremental impacts to cumulative effects by foreclosing recreational opportunities on the specially designated lands identified above or by dedicating any of the MUC L, M, or I lands identified in Table 3.13-3 where dispersed recreation occurs.

TABLE 3.13-3
EXITS FROM I-15 WITHIN 50 MILES OF PROJECT SITE EXITS

Exit Name	Miles from Project site exit	Acres of Class L land within 50 Miles of the Exit	Acres of Class M land within 50 Miles of the Exit	Acres of Class I land within 50 Miles of the Exit	Outside CDCA Plan Area
North of Zzyzx Road					
Baker Boulevard (I-15 Bus. north)	5.6	888,637	770,517	46,219	110,336
State Route 127 north/ Kelbaker Road – Death Valley	6.4	881,608	766,659	44,114	132,346
Baker Boulevard (I-15 Bus. south)	8.3	864,826	757,251	41,308	197,390
Halloran Springs Road	19.4	749,626	631,336	40,907	661,112
Halloran Summit Road	25.4	696,215	500,702	40,907	939,666
Valley Wells Rest Area	31.0	627,924	432,239	40,903	1224,719
Cima Road	32.6	611,942	416,856	40,898	1316,217
Bailey Road	41.3	587,135	359,799	37,750	1736,259
Nipton Road	46.3	543,310	341,739	27,229	1948,427
South of Rasor Road					
Basin Road	3.8	980,188	817,987	226,496	0
Afton Road	12.7	1,000,268	867,704	277,323	0
Clyde V. Kane Rest Area	16.8	1,025,110	923,017	1,025,110	0
Field Road	20.6	1,055,557	947,375	287,490	7,688
Harvard Road	27.8	1,195,989	871,750	279,778	78,345
Minneola Road	35.8	1,248,751	779,362	300,136	183,357
Yermo Road	37.9	1,240,595	769,822	303,904	205,783
Calico Road	39.6	1,227,777	768,917	303,853	216,820
Ghost Town Road	42.4	1,200,488	769,320	302,221	244,975
Fort Irwin Road	44.7	1,186,541	764,127	301,197	263,164
Old Highway 58	47.4	1,184,593	762,198	303,816	264,536
East Main Street (Exit 184)	49.3	1,173,974	763,574	297,888	317,103
I-40 east (Needles Freeway) (southbound exit is via Exit 184)	49.8	1,171,501	762,234	295,940	332,633

SOURCE: ESA, 2013

Beginning with the installation of fencing and continuing through all phases of these projects, the XpressWest and Calnev Pipeline Expansion projects could result in temporary and/or permanent changes in access to designated recreational areas or to dispersed recreational opportunities within the area where cumulative effects could occur. In light of the number of acres that would remain available for recreational use within each of the MUC classifications that would be affected by the Project under cumulative conditions, no substantial cumulative effects are anticipated. See Section 3.18, *Visual Resources*, for a discussion of potential impacts on the night sky, which could result in impacts on stargazing opportunities from recreational areas near the Project site.

As described above, 55,237 acres of public lands are proposed for development of renewable energy projects within the BLM Barstow and Needles field office areas. Of this, the Project represents approximately 7.5 percent. It is assumed that these cumulative projects, like the proposed Project, would be developed on a combination of CDCA Plan Multiple Use Classes L, M, and I, each of which allows different types of recreational activities, as described in Section 3.9, *Lands and Realty*. This development represents a small fraction of the overall public lands available for recreational use within this portion of the CDCA. Additionally, most of the projects in the cumulative scenario are located in areas with low recreation use, much like the Project site.

3.13.8 Mitigation Measures

The following measures are proposed to reduce adverse recreation-related impacts on travel routes within BLM-administered lands:

3.13-1: Travel Management Area Maps showing open, closed, and limited travel routes shall be updated and printed by the Applicant for posting by the BLM during each phase of the Project when the status or location of routes changes. These notices and signs shall clearly describe which routes will be closed temporarily or permanently.

3.13-2: The Applicant shall provide funding to the BLM for the preparation of a Recreation Area Management Plan for the Rasor Road OHV area.

3.13.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to recreation resources would remain. Although implementation of Mitigation Measure 3.13-1 would improve communication to OHV users about the status of routes near the Project site and Mitigation Measure 3.13-2 would improve management of the existing nearby Rasor Road OHV area, residual effects would remain due to the temporary and permanent closure of some on-site routes. Other impacts would be as described above in Sections 3.13.6 and 3.13.7, depending on the alternative chosen.

3.13.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G Section XV, a project would have a significant impact on recreation if it would:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated; or

b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.13.10.1 Alternative A: Proposed Action

a) Impact Rec-1: The Proposed Action would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (Less than Significant)

Increases in demand for recreational facilities typically are associated with substantial increases in population. The Proposed Action would not contain a residential component that would contribute new residents who could cause an increase in the use of existing recreational facilities, and it is assumed that a substantial majority of the Project workforce would be sourced primarily from the existing regional labor pool. For workforce estimates, see Section 2.4.3.9 (construction) and Section 2.4.4.1 (operation and maintenance). Nonetheless, some Project workers could add to the existing number of users of local, regional, or other parks and recreational facilities.

No existing neighborhood or regional parks are located on or adjacent to the Project site. Within the (larger) study area, the nearest neighborhood park is Chet Hoffman Community Park, which is located in Baker approximately 7 miles northeast of the Project site. There are no regional parks within the study area. Other recreational facilities that could be affected by Project workers (if used by them) include federal recreational areas such as the OHV routes located within and adjacent to the requested ROW area; the Mojave National Preserve, which is located 0.5 mile from the northeast end of the proposed north array; and the Afton Canyon Recreation Area, which is approximately 4 miles away. There is no indication that any of these opportunities or facilities are at or nearing their capacities for use. The Mojave National Preserve General Management Plan does not provide a quantitative standard for the preserve's carrying capacity (NPS, 2002). However, a visitor survey found that "visitors felt 'not at all crowded'" at the preserve in 2003, a year with slightly higher visitation than 2011 (NPS, 2007, 2013d). The preserve received just 2.7 visits per acre in 2011 (Table 3.13-1). Other federal recreational facilities in Table 3.13-1 with available information about recreational visits experienced similarly few visitors per acre per year, indicating that these facilities also likely are sparsely used and below carrying capacity. For these reasons, the Project is not expected to cause substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities but could add new users and, thereby, contribute an incremental increase in the existing demand for parks and recreation that could accelerate deterioration of existing parks or other facilities. Therefore, the Project would cause a less-than-significant impact related to this threshold of CEQA significance.

As described in Section 3.13.7, the projects considered in the cumulative context are located in areas with low recreation use, similar to the Project site, and are expected to affect few if any recreational facilities. The temporary and permanent workforces of these projects are not likely to use the same recreational sites as for the Proposed Action. Therefore, no significant cumulative impact on recreational facilities would occur to which the Project could have a cumulatively considerable contribution.

b) Impact Rec-2: Project-related realignment of Rasor Road to maintain OHV access would require construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (Less than Significant)

The Project proposes to realign a portion of Rasor Road, in part to maintain OHV access. Analysis of the effects of the necessary construction work to accomplish the realignment is provided on a resource-by-resource basis throughout this PA/EIS/EIR. See, for example, Section 3.2.6.1, relating to Air Resources, which analyzes toxic air contaminant emissions associated with the proposed realignment in the context of the overall Project, and Section 3.4.2.3, which notes that Mojave fringe-toed lizards were observed in the Rasor Road realignment corridor in 2012 (Panorama Environmental, Inc., 2013). Collectively, the impacts of constructing the proposed Rasor Road realignment would be less than significant because the affected segment would be short (i.e., approximately 500 feet) and the necessary work would be of short duration. No mitigation measures are required. The less-than-significant impact would not be cumulatively considerable because no other projects could cause impacts that would combine with those of the Project to cause or contribute to any significant adverse cumulative condition in or near the affected roadway segment.

3.13.10.2 Alternative B

a) Impact Rec-B1: Alternative B would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (Less than Significant)

Alternative B is expected to require the same or fewer construction workers and substantially the same number of operation and maintenance workers as the Proposed Action because fewer than all of the proposed solar arrays would be built, operated and maintained, and thereafter decommissioned. Accordingly, potential cumulative effects of Alternative B relating to the deterioration of local, regional, or other parks and recreational facilities would be substantially the same as the Proposed Action: less than significant. Further, for the same reasons, the incremental contribution of Alternative B to any cumulative impact to such facilities would not be cumulatively considerable.

b) Impact Rec-B2: Alternative B-related realignment of Rasor Road to maintain OHV access would require construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (Less than Significant)

Alternative B would include realignment of a portion of Rasor Road, in part to maintain OHV access. Analysis of the effects of the necessary construction work to accomplish the realignment is provided on a resource-by-resource basis throughout this PA/EIS/EIR. See, for example, Section 3.2.6.2, relating to Air Resources, which evaluates the proximity of the Rasor Road realignment to sensitive receptors and the anticipated duration of potential exposures, and Section 3.4.6.2, regarding road realignment-related effects on Mojave fringe-toed lizards. Collectively, the impacts of constructing the proposed Rasor Road realignment would be less than significant because the affected segment would be short (i.e., approximately 500 feet) and the necessary work would be of short duration. No mitigation measures are required. This less-than-significant impact would not be cumulatively considerable because no other projects could cause

impacts that would combine with those of Alternative B to cause or contribute to any significant adverse cumulative condition in or near the affected roadway segment.

3.13.10.3 Alternative C

a) Impact Rec-C1: Alternative C would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (Less than Significant)

Alternative C is expected to require the same or fewer construction workers and substantially the same number of operation and maintenance workers as the Proposed Action because fewer than all of the proposed solar arrays would be built, operated and maintained, and thereafter decommissioned. Accordingly, potential cumulative effects of Alternative C relating to the deterioration of local, regional, or other parks and recreational facilities would be substantially the same as the Proposed Action: less than significant. Further, for the same reasons, the incremental contribution of Alternative C to any cumulative impact to such facilities would not be cumulatively considerable.

b) Impact Rec-C2: Alternative C-related realignment of Rasor Road to maintain OHV access would require construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (Less than Significant)

Alternative C would include realignment of a portion of Rasor Road, in part to maintain OHV access. Analysis of the effects of the necessary construction work to accomplish the realignment is provided on a resource-by-resource basis throughout this PA/EIS/EIR. See, for example, Section 3.2.6.3, relating to Air Resources, and Section 3.4.6.3, regarding road realignment-related effects on Mojave fringe-toed lizards. Collectively, the impacts of constructing the proposed Rasor Road realignment would be less than significant because the affected segment would be short and the necessary work would be of short duration. No mitigation measures are required. This less-than-significant impact would not be cumulatively considerable because no other projects could cause impacts that would combine with those of Alternative C to cause or contribute to any significant adverse cumulative condition in or near the affected roadway segment.

3.13.10.4 Alternative D

a) Impact Rec-D1: Alternative D would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (Less than Significant)

Alternative D is expected to require the same or fewer construction workers and substantially the same number of operation and maintenance workers as the Proposed Action because fewer than all of the proposed solar arrays would be built, operated and maintained, and thereafter decommissioned. Accordingly, potential cumulative effects of Alternative D relating to the deterioration of local, regional, or other parks and recreational facilities would be substantially the same as the Proposed Action: less than significant. Further, for the same reasons, the incremental contribution of Alternative D to any cumulative impact to such facilities would not be cumulatively considerable.

b) Alternative D would not include recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment. (No Impact)

Alternative D would not include any realignment of Rasor Road, and does not propose and would not result in recreational facility construction, which could have an adverse effect on the environment. No impact would result. Because Alternative D would cause no impact related to this criterion, it would not cause or contribute to any cumulative effect.

3.13.10.5 Alternative E: No Action/No Project

a) Alternative E would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (No Impact)

No new workers would be attracted to the area if the BLM denied the requested ROW grant and the County denied the requested well permit application. Accordingly, there would be no Project-related increase in existing use of local or regional parks or other recreational facilities. No impact, and no contribution to cumulative conditions, would occur.

b) Alternative E would not include recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment. (No Impact)

Alternative E would not include any realignment of Rasor Road, and, as a no development alternative, would not result in recreational facility construction, which could have an adverse effect on the environment. No impact would result. Because Alternative E would cause no impact related to this criterion, it would not cause or contribute to any cumulative effect.

3.13.10.6 Alternative F: CEQA No Project

a) Impact Rec-F1: Alternative F would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (Less than Significant)

For Alternative F, the alternative-specific, incremental impacts described and analyzed for the action alternatives (i.e., the Proposed Action or Alternatives B, C, or D) would occur as described above; in addition, because no wells would be constructed under this alternative, water trucks (and water truck drivers) would be traveling to and from the Project site that would not do so for the action alternatives. These water purveyors are particularly likely to be local or regional, and therefore not to be new users of existing parks or other recreational facilities. Therefore, no substantial increase in the use of parks or other recreational facilities is expected to occur under Alternative F relative to the Proposed Action. The resulting impact would be less than significant, and not cumulatively considerable.

b) Alternative F would not include recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment. (No Impact)

Alternative F differs from the Proposed Action and Alternatives B, C, and D only in the respect that the County would deny the requested groundwater well permit application, thereby necessitating water to be transported (e.g., by trucks) to the site to meet construction, operation and maintenance, and decommissioning water demands. This element of Alternative F would not result in recreational facility construction. No impact would result. Because Alternative F would cause no impact related to this criterion, it would not cause or contribute to any cumulative effect.

3.13.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

a) Alternative G would not cause or accelerate the substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. (No Impact)

No new workers would be attracted to the area under this “no development” alternative. Accordingly, there would be no Project-related increase in existing use of local or regional parks or other recreational facilities. No impact, and no contribution to cumulative conditions, would occur.

b) Alternative G would not include recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment. (No Impact)

Alternative G would not include any realignment of Rasor Road, and, as a no-development alternative, would not result in recreational facility construction, which could have an adverse effect on the environment. No impact would result. Because this alternative would cause no impact related to this criterion, it would not cause or contribute to any cumulative effect.

References

Baker Community Services District (BCSD), 2013. BCSD Home Page. [bakercsd.com] Accessed May 24, 2013.

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.aa6ec747.File.pdf/CA_Desert_.pdf]

BLM, 2010a. Bureau of Land Management Wilderness Study Area List. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Law_Enforcement/nlcs/online_electronic.Par.20654.File.dat/WSA_Detailed%20Table_Updated_December2010.pdf]

BLM, 2010b. Rasor Off-Highway Vehicle Area. [http://www.blm.gov/ca/st/en/fo/barstow/rasor.html] Accessed April 30, 2013.

BLM, 2011a. Afton Canyon Subregion: Off-Highway Vehicle Route Supplement. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates/wemo_supplemental.Par.1946.File.pdf/AftonCanyon_09AUG2011.pdf]

BLM, 2011b. Cronese Lake Subregion: Off-Highway Vehicle Route Supplement. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates/wemo_supplemental.Par.56049.File.pdf/CroneseLake_09AUG2011.pdf]

BLM 2012a. BLM Public Land Statistics, Table 4-1: Estimated Recreational Use of Public Lands Administered by the BLM, Fiscal Year 2011. [http://www.blm.gov/public_land_statistics/pls11/pls4-1_11.pdf]

BLM, 2012b. BLM Recreation Management Information System Report #11, Off-Highway Vehicle Designations. Report generated November 5, 2012.

BLM, 2012c. BLM Recreation Management Information System Report #23c, Visits and Visitor Days by RMA, Barstow Field Office-FY 2011. Report generated November 5, 2012.

BLM, 2012d. WEMO Travel Management Area 1-Map 1 [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates/wemo_tma1_maps.Par.20801.File.dat/TMA1_01of15.pdf]

BLM, 2012e. WEMO Travel Management Area 5-Map 9. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates/wemo_travel_mgmt_area3.Par.72128.File.dat/TMA5_09of20.pdf]

BLM, 2013. West Mojave (WEMO) Plan Amendment Activity. [http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html] Accessed April 30, 2013.

Caithness Soda Mountain, LLC, 2011. Plan of Development, Soda Mountain Solar Project (March 15).

National Park Service (NPS), 2002. Mojave National Preserve General Management Plan, Introduction. [http://www.nps.gov/moja/parkmgmt/loader.cfm?csModule=security/getfile&PageID=114971] Accessed April 30, 2013.

NPS, 2007. Mojave National Preserve Business Plan, Fiscal Year 2007. [http://www.nps.gov/moja/parkmgmt/upload/MOJABusPlan2.pdf]

NPS, 2013a. All Recreation Visitors by Month: Mojave NPRES. [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/All%20Recreation%20Visitors%20By%20Month?Park=MOJA] Accessed April 30, 2013.

NPS, 2013b. MOJA Traffic Counts by Location. [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/All%20Recreation%20Visitors%20By%20Month?Park=MOJA] Accessed April 30, 2013.

NPS, 2013c. Zzyzx Road. [http://www.nps.gov/moja/planyourvisit/zzyzx.htm] Accessed April 30, 2013.

NPS, 2013d. Mojave NPRES Annual Park Visitation All Years. [https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Visitation%20(All%20Years)?Park=MOJA] Accessed August 2, 2013.

3.14 Socioeconomics and Environmental Justice

3.14.1 Introduction

3.14.1.1 Socioeconomics

This section describes the social and demographic background and existing conditions in areas surrounding the Project site, including the nearby community of Baker, communities in the Barstow and Victorville-Hesperia areas of southwestern San Bernardino County, as well as Clark County, Nevada. Additionally, this section discusses applicable plans, policies, and regulations that represent the social aspirations, community characteristics, and desired lifestyle, values, and goals of the local stakeholders. These plans, policies, and regulations are necessary to understanding social group concerns in the context of renewable energy development. Information in this section is based on data obtained from national and regional sources, including the United States Census Bureau, the U.S. Bureau of Economic Analysis (BEA), and the California Employment Development Department (EDD). No comments and concerns related to socioeconomic conditions were raised during the scoping process (see Appendix B).

3.14.1.2 Environmental Justice

The environmental justice portion of this section provides an overview of the applicable policies, regulations, and existing conditions for environmental justice, which the BLM Land Use Planning Handbook defines as ". . . the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (BLM, 2005). The purpose of the environmental justice analysis is to determine whether and how the environmental and human health-related impacts of the Proposed Action and alternatives may disproportionately affect minority and low-income populations, if at all. The study area is defined by the boundaries of several planning areas for which demographic data are available and which encompass the potential affected area for environmental justice. Data on minority populations, low income populations, and Tribes who may be impacted by the Project are provided for these planning areas. As summarized in Appendix B, one comment was received from USEPA during the scoping period for this Project that indicated the potential for disproportionate adverse impacts to minority and low-income populations; this comment is addressed in this section.

3.14.2 Regional and Local Environmental Setting

3.14.2.1 Socioeconomics

The Project site is located in northeastern San Bernardino County, approximately 6 miles southwest of the community of Baker. The site and its immediately adjoining areas are vacant, with no existing population or housing. Therefore, both temporary and long-term workforce would be expected to commute to the Project site from nearby populated areas. Although there is little available research and analysis providing guidance for determining the socioeconomic impact area

boundaries for power generation facilities, the widely referenced Electric Power Research Institute (EPRI) analysis entitled "Socioeconomic Impacts of Power Plants" (1982) indicates that workers may commute as much as 2 hours each direction from their communities rather than relocate. Therefore, areas of potential social and economic effects for the Project include San Bernardino County, in particular the community of Baker (a Census-designated place [CDP]), Barstow Census County Division (CCD), and Victorville-Hesperia CCD; and Clark County, Nevada.

Economic and employment data are generally available only for counties or Metropolitan Statistical Areas (MSAs) consisting of whole counties. For this analysis, therefore, the socioeconomics regional study area consists of San Bernardino County, California, and Clark County, Nevada. Where important additional data are available for Riverside-San Bernardino-Ontario MSA, consisting of Riverside and San Bernardino counties, they are used for reference. With respect to housing analysis, data for counties are supplemented with those for cities and communities nearer the Project site.

The 2-hour travel area also extends into parts of Kern County, California. However, given that there are no major urban centers in Kern County that would be located in the 2-hour travel area, it is not included in this analysis.

Guidelines in the BLM Land Use Planning Handbook, Appendix D, state that the analysis of a proposed resource management or land use plan amendment needs to consider existing socioeconomic conditions and impacts on several geographic scales. As noted above, at the regional scale, this analysis examines data for San Bernardino and Clark counties, as well as Riverside-San Bernardino-Ontario MSA, and Barstow and Victorville-Hesperia CCDs where appropriate. These communities represent the regional study area. At the local scale, the analysis examines the nearest communities (the local study area): Baker (approximately 6 miles northeast of the site) and the City of Barstow (approximately 50 miles southwest of the site). Barstow is the only major community located within an hour's drive of the Project site.

Population

Population estimates and recent growth trends for both the regional and local study areas are summarized in Table 3.14-1. Where available, historical data (1990 and 2000 census data) are shown (the boundaries of CCDs change from one census to the next, and so are not comparable across this period). Projections for future growth are prepared for counties by the respective states (California Department of Finance and Nevada State Demographer's Office), and in some cases for counties and cities by regional and local planning agencies and organizations.

As shown in Table 3.14-1, the population of San Bernardino County grew rapidly between 2000 and 2010, and the communities along I-15 approximately 1.5 hours' drive from the Project site, including the cities of Victorville, Adelanto, Hesperia, and the Town of Apple Valley, have grown at a greater pace than the County as a whole, experiencing some of the most rapid growth of all cities in the County. Population growth in both San Bernardino County and Clark County, Nevada is expected to remain high (over 10 percent per decade) over the next few decades, though slower than in the 2000s. Baker, the unincorporated community nearest the Project site, experienced population decline between 2000 and 2010. No projections were available for this community.

TABLE 3.14-1
HISTORICAL AND PROJECTED POPULATION OF THE STUDY AREA

	Census		Projections		
	2000	**2010**	**2020**	**2030**	**2040**
San Bernardino County	1,719,190	2,038,445	2,283,798	2,588,990	2,885,687
10-year Growth	--	*18.6%*	*12.0%*	*13.4%*	*12.8%*
Baker CDP	914	735	--	--	--
10-year Growth	--	*-19.6%*	--	--	--
City of Barstow	21,119	22,639	27,300	36,200[a]	--
10-year Growth	--	*7.2%*	*20.6%*	*32.6%*[a]	--
City of Victorville	64,029	115,903	145,300	190,100[a]	--
10-year Growth	--	*81.0%*	*25.4%*	*30.8%*[a]	--
City of Adelanto	18,130	31,765	46,100	68,400[a]	--
10-year Growth	--	*75.2%*	*45.1%*	*48.4%*[a]	--
City of Hesperia	62,582	90,173	98,200	132,500[a]	--
10-year Growth	--	*44%*	*8.9%*	*34.9%*[a]	--
Town of Apple Valley	54,239	69,135	82,900	109,000[a]	--
10-year Growth	--	*27.5%*	*19.9%*	*31.5%*[a]	--
Clark County, NV	1,428,689	1,951,269	2,209,526	2,430,896	2,999,000
10-year Growth	--	*36.6%*	*13.2%*	*10.0%*	*23.4%*

NOTES:
[a] Numbers represent 2035 projection and 15-year growth, respectively, and are based on available projections.
CDP = Census Designated Place

SOURCES: CA DOF, 2005, 2012; U.S. Census 2000, 2010; SCAG, 2012; Nevada State Demographer's Office, 2011; Tra and Drury, 2012

Housing

Most recent available (2010) housing information for the regional and local study areas is summarized in Table 3.14-2. The three major communities located within a 1.5-hour commute of the site are shown, as well as data for both San Bernardino and Clark counties.

In 2010, San Bernardino County had nearly 700,000 housing units, with a vacancy rate of 12.6 percent. Census Tract (CT) 103, covering the rural areas nearest the Project site including the community of Baker, had just over 2,100 units, with a vacancy rate of 33.1 percent. Barstow CCD, which includes the City of Barstow and adjacent communities, had 17,770 units, with a vacancy rate of 16.4 percent. Victorville-Hesperia CCD represents the communities further southwest on I-15, and had nearly 126,000 units with a somewhat lower vacancy rate of 11.2. The higher vacancy rates in Barstow CCD than in Victorville-Hesperia CCD likely result from slower population growth in Barstow than in the cities further southwest, as shown in Table 3.14-2.

Clark County, Nevada had 840,343 housing units and vacancy rate of 14.9 percent.

TABLE 3.14-2
HOUSING PROFILE OF THE REGIONAL STUDY AREA (2010)

	San Bernardino County, CA	CT 103	Barstow CCD, CA	Victorville-Hesperia CCD, CA	Las Vegas CCD	Clark County, NV
Total Housing Units	699,637	2,117	17,770	125,935	757,813	840,343
Occupied Housing Units	611,618	1,417	14,855	111,833	647,661	715,365
Percent Owner Occupied	62.7	64.6	58.3	67.1	55.4	57.1
Percent Renter Occupied	37.3	35.4	41.7	32.9	44.6	42.9
Vacant Housing Units	88,019	700	2,915	14,102	110,152	124,978
Percent Vacant	12.6	33.1	16.4	11.2	14.5	14.9
Vacant Units for Seasonal, Recreational, or Occasional Use	34,104	344	367	1,623	16,340	22,002
Vacant Units for Sale	12,138	37	432	3,301	24,428	26,963
Vacant Units for Rent	21,892	77	1,142	4,019	44,445	47,504

SOURCE: U.S. Census Bureau, 2010b

Rental Homes

As shown above in Table 3.14-2, vacancy rates are high in the study area. The 2010 Census reports that as of 2010, vacancy rates in the planning areas within 1 hour of the Project site (CT 103, Barstow CCD) were 16 to 33 percent. Of the vacant units, 1,209 units were for rent.

Hotel and Motel Accommodations

In addition to existing residential units, construction workers and operational workers could use other local lodging facilities as temporary housing. A search for hotels in the Project vicinity found 3 hotels and motels in Baker, 29 in the Barstow region, and 40 in the Victorville-Hesperia region (tripadvisor.com, 2012a, 2012b, 2012c). These hotels ranged in size from approximately 20 to 175 rooms each. These local hotel and motel rooms would provide an option for temporary housing, particularly for workers that might be willing to share accommodations.

Although Clark County, Nevada has a substantial number of hotel and motel accommodations, the attractiveness of these resources for construction workers may be lower than those in San Bernardino County, due to the greater travel time from the Project site and the proximity of Clark County hotels and motels to areas of interest to tourists, such as Las Vegas, resulting in higher room rates and lower vacancy rates.

Campgrounds and RV Parks

In addition, other housing opportunities are available in the form of RV facilities, mobile home sites, and campgrounds. These types of facilities could be usable by Project construction workers as temporary housing. Generally, their lower costs for overnight use could make them attractive as a temporary housing resource, particularly for construction workers who may own their own RV or trailers. In the Barstow area, the Barstow Calico KOA has 70 pull-through RV sites and

additional non-RV sites (Old Grove Properties LLC, 2010), and the Shady Lane RV Park has 33 sites (RVparking.com, 2012). The Shady Oasis Kampground in Victorville has 106 sites (Good Sam Club, 2012).

Additionally, the BLM operates three campgrounds in the general vicinity of the local study area: Rainbow Basin/Owl Canyon, Sawtooth/New Jack City, and Afton Canyon. Except for "special areas" with specific camping regulations, vehicle camping is allowed anywhere on BLM-administered land within 300 feet of any posted Open Route. However, there are no facilities in these locations, and there is a 14-day limit for camping in any one location. (BLM, 2011)

3.14.2.2 Economic Conditions

Employment and Income

Regional employment statistics by industry sector for 2011 and 2010 (as available) are summarized in Table 3.14-3. In the Riverside-San Bernardino-Ontario MSA, which consists of San Bernardino and Riverside counties, and in San Bernardino County alone, the government sector (federal, state, and local) employs the most workers among the two-digit NAICS (North American Industry Classification System) codes, accounting for 19 to 20 percent of workers. In Clark County, the largest industry by employment is leisure and hospitality, owing to the presence of the gambling and associated entertainment industry. Other important industries in the study area include retail trade, educational and health services, and professional and business services.

TABLE 3.14-3
EMPLOYMENT BY INDUSTRY GROUP

NAICS Code	Industry	Riverside-San Bernardino-Ontario, CA MSA (2011)	San Bernardino County, CA (2011)	Clark County, NV (2010)
11-000000	Total Farm	14,900	2,100	245
10-000000	Mining and Logging	1,000	600	2,453
20-000000	Construction	58,700	24,500	55,752
30-000000	Manufacturing	85,800	46,800	21,943
41-000000	Wholesale Trade	49,400	29,500	24,691
42-000000	Retail Trade	157,200	77,800	109,899
43-000000	Transportation, Warehousing & Utilities	68,500	48,200	39,666
50-000000	Information	15,000	5,300	12,607
55-000000	Financial Activities	39,200	20,900	134,558
60-000000	Professional & Business Services	126,100	73,400	144,245
65-000000	Educational & Health Services	137,900	76,300	84,253
70-000000	Leisure & Hospitality	124,300	55,000	275,170
80-000000	Other Services	39,300	20,300	45,708
90-000000	Government	227,300	115,100	111,500
	Total--All Industries	1,144,600	595,900	1,062,690

SOURCE: EDD, 2012a, 2012b; BEA, 2010

In 2011 (the most recent data available), the American Community Survey estimated the median household income in the City of Barstow at $45,417 and in Baker at $33,000 (U.S. Census Bureau, 2011).

Labor Force and Unemployment

From January to September of 2012, San Bernardino County had a labor force of about 864,200 workers, of whom 759,500 were employed, resulting in an unemployment rate of 12.1 percent. This labor force grew from 860,600 in 2011, and the unemployment rate dropped from 13.2 percent (EDD, 2012c). The relatively high unemployment rate reflects the continuing impact of the recession beginning in 2008, and the rate is likely to continue to improve (decline) in future years as the regional economy recovers. The unemployment rate in the Riverside-San Bernardino-Ontario MSA was 11.6 percent in September 2012, dropping from 13.5 percent one year prior. The unadjusted unemployment rate for September 2012 was 9.7 percent in California. (EDD, 2012d).

As of September 2012, Clark County has a labor force of 980,996 workers, with an unemployment rate of 12.2 percent. Both the size of the labor force and the unemployment rate were down from 2011, with 994,152 workers and 13.9 percent unemployment in Clark County (Nevada Department of Employment, Training, and Rehabilitation, 2012).

3.14.2.3 Environmental Justice

To consider environmental justice issues in the context of the Project, this analysis uses a demographic screening evaluation to determine whether a minority and/or low-income population exists within two potentially affected study areas. The primary study area consists of the census tract and one CDP contained within a 6-mile radius beyond the site boundary. This radius is consistent with air quality modeling of the range of the Project's air quality impacts, and is also an appropriate study area for potential hazards and water resources impacts, which are likely to be highly localized and could be felt disproportionately by one local community than another.

A secondary study area consists of counties, cities, or CCDs containing the 2-hour travel radius centered on the Project site and reflects the potential area from which workers may be brought together for construction of the Project. These units, which are larger in population than CDPs and census tracts, provide an appropriate level of demographic detail for effects within the secondary study area (e.g., traffic or socioeconomic effects) because such effects are more likely to be spread throughout the study area rather than felt within specific local neighborhoods or communities.

The demographic screening to determine the presence of minority and low-income populations is based on information contained in two documents: Environmental Justice: Guidance Under the National Environmental Policy Act (CEQ, 1997) and Final Guidance for Incorporating Environmental Justice Concerns in USEPA's NEPA Compliance Analyses (USEPA, 1998). The screening process relies on 2010 Census data to determine the presence of minority and low-income populations. In addition to the demographic screening analysis, this EIS follows the steps recommended by the USEPA's guidance documents, which recommend outreach and

involvement, and, if warranted, a detailed examination of the distribution of impacts on segments of the population.

The resources listed in Table 3.14-5 were determined to have the potential for impacts on human health or the environment that could affect local populations. Other resources discussed in this PA/EIS/EIR, such as cultural resources, lands and realty, mineral resources, and paleontological resources, were determined to have no potential impacts on human health or the environment that could affect local populations and, therefore, were not reviewed further for potential environmental justice effects. Because the geographic scope of impacts differs by resource, the communities considered for the environmental justice analysis similarly vary by type of environmental or human health effect. Table 3.14-5 shows the geographic scope of the environmental justice analysis for each resource considered.

TABLE 3.14-5
GEOGRAPHIC SCOPE OF ENVIRONMENTAL JUSTICE ANALYSIS BY RESOURCE

Resource	Geographic Scope of Effects	Communities
Air Quality	6-mile radius from Project site boundary	CT 103, Baker CDP
Biological and Cultural Resources (traditional and/or medicinal use of vegetation)	Project site	none
Geology and Soils	Project site	none
Hazards and Hazardous Materials	Project site	CT 103, Baker CDP
Noise and Vibration	0.5-mile radius from Project site boundary	none
Recreation	10-mile radius from Project site	CT 103, Baker CDP
Socioeconomics	2-hour travel radius from Project site	City of Barstow, CT 103, Baker CDP
Transportation	2-hour travel radius from Project site	City of Barstow, CT 103, Baker CDP
Visual Resources	Project viewshed	CT 103
Water Resources	groundwater basin, downstream areas	CT 103, Baker CDP

The Project site is located within CT 103 in central San Bernardino County, approximately 6 miles southwest of Baker (U.S. Census Bureau, 2010a). The site and its immediately adjoining areas are vacant, with the exception of a small number of residents at the service station at Rasor Road. There are few communities within CT 103, Baker being the only CDP within the tract. In addition, based on the communities identified as being within the study area in Table 3.14-5, data on minority populations and incidences of poverty are provided for San Bernardino County, Clark County (Nevada), the Barstow CCD (this includes the City of Barstow and its surrounding communities), and the City of Barstow alone. Some of these areas provide a degree of overlap (e.g., CT 103 and Baker; Barstow CCD and the City of Barstow), the purpose of which is to ensure that appropriate geographic units are examined to avoid artificially diluting or inflating the affected minority populations (CEQ, 1997).

Minority Population

According to the CEQ Guidance (1997), minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of environmental justice, is identified when the minority population of the potentially affected area is greater than 50 percent or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis (CEQ, 1997).[1]

Table 3.14-6 presents the minority population composition of the planning areas surrounding the Project site as described above, based on the 2010 Census. Total minority population, defined as the total percentage of population from racial or ethnic groups other than non-Hispanic White, ranges from 40.5 percent in CT 103, the planning area in which the Project site is located, to 73.5 percent in Baker CDP. The proportion of total minority population in San Bernardino County as a whole is 66.7 percent. Hispanic and Latino populations make up the majorities of the total minority populations in these areas, ranging from 29.1 percent in Clark County to 68.3 percent in Baker CDP. For San Bernardino County as a whole, the Hispanic and Latino population represents 49.2 percent of the total population.

In all planning areas considered, with the exception of CT 103, minority populations exceed 50 percent of total population (U.S. Census Bureau, 2010b). Therefore, each of these planning areas except CT 103 is considered to be a community of concern to the environmental justice analysis.

Low-Income Population

Unlike the CEQ (1997) guidance on minority populations, none of the environmental justice guidance documents contain a quantitative definition of what proportion of low-income individuals defines a low-income population. In the absence of guidance, for this analysis, if the proportion of individuals living under the poverty line is 150 percent or more than that of the general population, that community is considered a low-income population.

USEPA guidance (1998) recommends use of Census data on poverty income as one indicator and other local data as may be available. This analysis uses the percentage of individuals with income below the Census-defined poverty level. The percentage is compared to that of the general population, and the affected area is included in the analysis if the percentage of low-income population is meaningfully greater than that of the general population, based on the same thresholds as in the case of minority population.

For this analysis, proportions of people living in poverty were obtained from the 2006-2010 American Community Survey, (U.S. Census Bureau, 2010c). The U.S. Census Bureau defines poverty using standards set by the U.S. Office of Management and Budget's Statistical Policy Directive 14 (U.S. Office of Management and Budget, 1978; U.S. Census Bureau, 2011). Family

[1] According to the CEQ guidelines, "Minority" is defined as all persons except non-Hispanic whites. In other words, minority is defined as any racial groups other than white, and all persons of Hispanic origin, regardless of race.

TABLE 3.14-6
RACIAL AND INCOME CHARACTERISTICS FOR RESIDENTS WITHIN THE STUDY AREA

	San Bernardino County, CA	CT 103, CA	Baker CDP, CA	Barstow CDD, CA	City of Barstow, CA	Clark County, NV
Total Population	2,035,210	3,846	735	41,257	22,639	1,951,269
Hispanic or Latino (All Races)	49.2%	32.9%	68.3%	37.7%	42.8%	29.1%
Non-Hispanic White	33.3%	59.5%	26.5%	44.9%	34.2%	48.0%
Non-Hispanic Black or African American	8.4%	2.3%	0.1%	9.5%	13.8%	10.0%
Race, alone or in combination with one or more other races:						
White	60.8%	74.3%	44.1%	66.5%	58.3%	65.0%
Black or African American	10.3%	2.9%	0.3%	12.3%	17.7%	12.0%
American Indian and Alaska Native	2.2%	3.3%	0.8%	3.9%	4.3%	1.5%
Asian	7.6%	1.6%	1.8%	4.1%	4.9%	10.6%
Native Hawaiian and Other Pacific Islander	0.7%	1.0%	2.0%	1.4%	1.9%	1.4%
Some Other Race	24.0%	21.4%	54.1%	19.0%	21.6%	15.1%
Percent Total Minority (Other Than Non-Hispanic White)	66.7%	40.5%	73.5%	55.1%	65.8%	52%
Percent of People Below Poverty Level	14.8%	22.5%	13.0%	19.0%	21.4%	11.7%

NOTES: All population, race, and ethnicity data are from 2010 Census; data on poverty level from American Community Survey (most recent data, as applicable).

SOURCE: U.S. Census Bureau, 2010b, 2010c.

income is compared to thresholds that vary according to family size, age, and number of children under 18 years old. If a family's total income is less than the applicable threshold, then every person in the family is considered to be in poverty. Poverty thresholds are the same for all geographic areas and are adjusted annually by the Consumer Price Index.

In 2010, the poverty threshold for a single person under 65 years of age was $11,344 and for a person 65 years and over was $10,458. For a four-person family with two children under 18 years of age, the poverty threshold was $22,113. Other thresholds are defined for different family sizes and compositions (U.S. Census Bureau, 2011).

As shown in Table 3.14-6, 22.5 percent of all persons in CT 103 belonged to families with income below the poverty level (U.S. Census Bureau, 2010c). This was the highest proportion among planning areas examined for this analysis, and is greater than 150 percent of the proportion of families with income below the poverty level in San Bernardino County as a whole. By comparison, 13.0 percent of total population in Baker CDP belonged to families with income below the poverty level, 19.0 percent in Barstow CCD, 14.8 percent in San Bernardino County,

21.4 percent in the City of Barstow, and 11.7 percent in Clark County, Nevada. Therefore, CT 103 is a community of concern for environmental justice effects related to poverty.

3.14.3 Applicable Laws, Regulations, Plans, and Standards

3.14.3.1 Federal

Civil Rights Act

Title VI of the Civil Rights Act of 1964 (42 USC §2000d et seq.) prohibits discrimination on the basis of race, color, or national origin in all programs or activities receiving federal financial assistance.

Executive Order 12898

Executive Order 12898, "Federal Actions to address environmental justice in Minority Populations and Low-Income Populations," (59 FR 7629; Feb. 16, 1994) focuses federal attention on the environment and human health conditions of minority and low-income communities and calls on agencies to achieve environmental justice as part of its mission. The order requires the USEPA and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue as part of the NEPA process. The agencies are required to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

The CEQ has oversight responsibility for the Federal Government's compliance with Executive Order 12898 and NEPA. The CEQ, in consultation with the USEPA and other agencies, has developed guidance to assist Federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. According to the CEQ's "Environmental Justice Guidance Under the National Environmental Policy Act," agencies should consider the composition of the affected area to determine whether minority populations or low-income populations are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse environmental effects (CEQ, 1997).

BLM Environmental Justice Requirements

BLM Land Use Planning Handbook, H-1601-1, Appendix D, Section IV (Environmental Justice Requirements) provides guidance for assessing potential impacts on population, housing, and employment as they relate to environmental justice (BLM, 2005).

3.14.3.2 State

California Revenue and Taxation Code §73

Assembly Bill 15, signed by the California Governor in June 2011, modified and extended existing state law excluding an "active solar energy system" from calculation of cash value subject to property taxation. An active solar energy system includes PV panels, inverters, and

other improvements necessary to deliver electric power for transmission or final use. The exclusion applies to new systems constructed prior to January 1, 2017, and remains in effect until a change in ownership occurs.

3.14.3.3 Local

San Bernardino County General Plan

The following policy identified in the Conservation (CO) element of the San Bernardino County General Plan is relevant to this analysis as it pertains to an energy facility and its potential effects on local communities (San Bernardino County, 2007).

> ***Policy CO 8.1*:** Maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy facilities. The County will site energy facilities equitably in order to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce peak load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly in providing energy efficiency programs and locating energy facilities.

3.14.4 Analytical Methodology

3.14.4.1 Socioeconomic Effects

The CEQ's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508; reprinted in CEQ, 2005) provide standards for addressing social and economic effects in preparing an environmental impact statement. Section 1508.14 of these regulations states: " 'Human environment' shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. . . . This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment."

In Section 1508.8(b), the regulations state that indirect effects of an action "may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

Consistent with these regulations, this analysis of socioeconomic impacts will examine impacts of the Project and alternatives with respect to the following issues:

1. Housing availability and the character of local communities that may result from employment of workers for the construction, operation, and decommissioning;

2. Employment and economy of San Bernardino County, California, and Clark County, Nevada, from spending and employment by the Project; and
3. Revenues of San Bernardino County government which would provide local public services to the Project.

The analysis of potential socioeconomic effects of the Proposed Action and alternatives takes place in the context of physical effects related to population and housing. An input-output model (IMPLAN) was used to estimate the indirect and induced economic impacts from construction operation, maintenance, and decommissioning of the Project (Regional Economics Consulting, 2013).

CEQA Guidelines Section 15382 states: "An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant." Thus, for purposes of CEQA, population growth or displacement of people and/or housing is considered in the context of the construction of new or replacement housing, which could result in physical environmental impacts.

3.14.4.2 Environmental Justice

The USEPA guidance states that the analysis of environmental justice should determine if the affected area of minority population and/or low-income population is subject to "disproportionately high and adverse human health or environmental effects" from the Project. The guidance suggests that a comparative analysis be performed on potential Project impacts to the affected population and a reference population to determine the type of high and adverse effects and the extent of disproportionality (USEPA, 1998).

The findings and analysis contained in the following sections of this PA/EIS/EIR have been reviewed as part of this analysis of environmental justice issues: 3.2, *Air Resources*; 3.7, *Geology and Soil Resources*; 3.8, *Hazards and Hazardous Materials*; 3.11, *Noise and Vibration*; 3.14, *Recreation*; 3.16, *Transportation and Travel Management;* 3.18, *Visual Resources*; and 3.19, *Water Resources*. In reviewing each of these sections, this environmental justice analysis considers potential impacts and mitigation measures and whether a "disproportionately high and adverse" (CEQ, 1997) impact would result for the communities of concern, CT 103 and Baker CDP. Other sections (such as mineral resources and lands and realty) were determined to have no potential health or environmental effects on the local populations and, therefore, were not reviewed further for potential environmental justice impacts.

3.14.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address potential impacts to socioeconomic or environmental justice considerations.

3.14.6 Direct and Indirect Effects

3.14.6.1 Alternative A: Proposed Action

Socioeconomics

Construction

The Proposed Action could result in socioeconomic impacts primarily due to construction employment. Construction would be temporary and is expected to last for 24 to 30 months. Because the Project site does not currently support economic uses, Project construction would not displace any economic activity. The locations from which construction workers would commute to the site are a key factor determining the extent of potential impacts to the local economy and communities. Income from employment primarily would benefit the communities in which the construction workers and their families reside because this is where most household expenditures occur.

The number of personnel on-site would average approximately 215 workers, with a peak of up to 290 workers (a combination of direct labor and supervisory and other personnel). Based on its intention to use local labor unions, the Applicant expects most construction workers to come from San Bernardino County, where a substantial number of workers in relevant occupations reside (24,500 construction workers in San Bernardino Counties; Table 3.14-3), and where the current unemployment rate is high. It is possible, however, that some workers will come from the Las Vegas MSA. The Proposed Action is not anticipated to result in direct impacts related to the availability of labor within the 2-hour travel distance, but may result in indirect impacts on labor outside of this area by reducing the number of workers available to meet other projects' demands. Such potential impacts are described in more detail in Section 3.14.7, *Cumulative Effects*.

With the exception of Barstow, most large communities in these areas are 2 hours or more travel time away from the Project site. Because construction would be temporary, it is not expected that workers from outside the Project vicinity would permanently relocate to communities closer to the Project site (such as Barstow or Baker), and therefore would not contribute to population growth in the local area. Some workers may engage in "weekly commuting," in which they find temporary or transient housing closer to the jobsite during the workweek. It is expected that such workers would seek temporary housing in the local area, where both rental housing as well as a large number of hotel or motel rooms would be available. Any such workers who choose to reside temporarily in the local area would have a limited service impact on local public services and infrastructure.

As of the 2010 Census, there were 77 vacant housing units for rent in CT 103, which covers Baker and surrounding area, and there were 1,142 units for rent in the Barstow CCD, for a total of approximately 1,200 units within an hour's driving distance of the site. There were also approximately 4,000 units in the Victorville-Hesperia CCD, and over 44,000 in the Las Vegas CCD, of which most are within a 2-hour driving distance of the site (Table 3.14-2). As indicated in Section 3.15.2, there are numerous hotel and motel rooms available in Barstow, as well as in communities approximately 30 minutes further from the site that could provide temporary housing to some workers. Additionally, there are several RV facilities, mobile home sites, and

campgrounds in these areas, which could provide alternative forms of temporary housing. Thus, there would be a sufficient supply of temporary housing options to accommodate construction workers who may seek temporary housing near the jobsite. As a result, any adverse construction-related housing and community impacts associated with the Proposed Action would be negligible and would only occur on a short-term basis.

Operation and Maintenance

Long-term operating staff for the Proposed Action would number approximately 25 to 40 workers. In contrast to construction employment, it is expected that these workers either would be hired locally or, if hired from outside the local area, would relocate to the area (most likely to Barstow, and potentially Baker). Due to the numbers of vacant homes in CT 103 and Barstow CCD for sale (approximately 470) or for rent (approximately 1,200), there would be adequate local housing supply, even if all long-term workers were to relocate to the local area. Therefore, the Proposed Action would not directly induce substantial population growth through the creation of a substantial number of new permanent jobs.

The Proposed Action would not indirectly induce substantial population growth by introducing a new source of electricity because although it would produce additional electricity and increase service capacity, it is intended to meet the demand for energy that is already projected based on growth in demand for electricity in LADWP's service area, which extends well beyond the regional study area, and therefore would not induce substantial growth or concentration of population in either the regional or local study areas.

Decommissioning

At the expiration of the ROW grant and permits, the Project would be decommissioned, with all equipment and improvements dismantled and removed from the site, and the site would be restored to an undeveloped condition. The workforce and length of time for decommissioning is expected to be similar to that of the construction period. It is difficult to forecast housing and employment conditions 30 or more years into the future; however, based on growth projections shown in Table 3.14-1, it is expected that the available housing and labor pool would be greater than existing conditions. Similar to Project construction, the temporary decommissioning workforce would likely come mostly from San Bernardino County. Many workers would likely commute to the Project site. For workers who choose to commute weekly or temporarily relocate to the local area during the workweek, it is expected that sufficient numbers of rental properties and hotel and motel accommodations would be available in the area, and that the needs of the temporary decommissioning workforce would not have an adverse effect on housing.

Economic Conditions

Construction

Unemployment rates were over 12 percent in both San Bernardino and Clark counties as of September 2012. Because the Project would employ an average of 215 people throughout the construction period, Project construction would have a beneficial impact with respect to unemployment and the regional economy.

This employment also would have beneficial effects beyond just labor income, most of which would be realized in San Bernardino County. The potential regional economic impact of Project construction was estimated using a regional IMPLAN model of San Bernardino County's economy that can be used to estimate the indirect and induced impacts of employee spending. Direct effects include payments for the on-site construction activities, project engineering, and associated permits and mitigation expenditures; indirect effects include revenues to local suppliers, contractors, and providers of services, and induced effects include revenues to the retail and services sectors which receive the household expenditures of the direct and indirect businesses (Regional Economics Consulting, 2013). The sum of direct, indirect, and induced output represents the total economic or employment impact to the region. For purposes of this analysis, San Bernardino County is the region of interest, since almost all workers are expected to come from within the County.

Estimates of direct, indirect, and induced effects of the construction phase are shown in Table 3.14-7.

TABLE 3.14-7
SAN BERNARDINO COUNTY EMPLOYMENT AND INCOME IMPACTS FROM PROJECT CONSTRUCTION

	Job Years (FTE)[a]	Employee Compensation	Value Added[b]	Economic Output
Direct Effect	5,298	$300,793,546	$332,457,134	$511,047,616
indirect Effect	448	$17,918,072	$28,545,249	$48,248,495
Induced Effect	1,709	$62,065,115	$123,889,757	$196,340,377
Total Effect	**7,454**	**$380,776,733**	**$484,892,140**	**$755,636,488**

NOTES:
[a] A full time equivalent (FTE) is the equivalent of a single person employed full-time for an entire fiscal year.
[b] Value added is a measure of indirect business taxes (including excise, sales, and property taxes; fees; fines; licenses; and permits) and other property type income (such as rent payments and interest income).

Totals may not add due to rounding.

SOURCE: Regional Economics Consulting, 2013, Table 4

The Applicant anticipates that all construction workers would come from San Bernardino County, based on its intent to work with San Bernardino County labor unions to hire construction crews. Additionally, direct output includes the compensation of other personnel involved in Project engineering and permitting. These workers' estimated combined income over the design, permitting, and construction period would be over $500 million. Including direct and induced effects, the total employment effect is estimated to be 7,454 full-time equivalent (FTE) job years, with total compensation of $380 million, and total output of $755 million through the end of the Project construction period. To the extent that workers come from or work outside of San Bernardino County, some of this effect would be realized in workers' home counties. Impacts on the regional economy and employment as a result of constructing the Proposed Action would be beneficial.

Operation and Maintenance

The employment of up to 40 workers to operate and maintain the Project would not adversely affect the regional labor market because unemployment rates are currently high, and likely would not decrease to the extent that Project-related job creation would adversely affect the local labor market. The economic analysis prepared for the Project assumed that not all of these workers would be full-time. Table 3.14-8 shows that total employment impact in the County, including direct and induced impacts, would be 60 FTE jobs annually, with total direct effect of $3.8 million per year, and total economic output of $9.8 million per year.

TABLE 3.14-8
REGIONAL EMPLOYMENT AND INCOME IMPACTS FROM PROJECT OPERATION AND MAINTENANCE

	Job Years (FTE)[a]	Employee Compensation	Value Added[b]	Economic Output
Direct Annual Effect	35	$2,941,112	$5,092,379	$7,035,817
Indirect Annual Effect	8	$288,075	$455,137	$752,414
Induced Annual Effect	17	$633,389	$1,264,106	$2,003,575
Total Annual Effect	**60**	**$3,862,577**	**$6,811,622**	**$9,791,805**

NOTES:
a A full time equivalent (FTE) is the equivalent of a single person employed full-time for an entire fiscal year.
b Value added is a measure of indirect business taxes (including excise, sales, and property taxes; fees; fines; licenses; and permits) and other property type income (such as rent payments and interest income).

SOURCE: Regional Economics Consulting, 2013, Table 7

Based on the direct employee compensation in Table 3.14-8, the average annual salary of a full-time operation and maintenance employee would be approximately $84,000, including employer-paid benefits. This is substantially higher than the most recent estimated median household income in either Barstow or Baker. However, because the number of long-term personnel employed by the Project is low in comparison to the population of these communities, Project operation and maintenance would not result in a substantial influx of highly paid workers that could affect housing prices or result in other socioeconomic impacts.

Decommissioning

The workforce and length of time required to decommission the Project and restore the site is expected to be similar to that of the construction period. Although future unemployment rates cannot be accurately estimated, it is expected that demand for an average of 200 workers for this final phase of the Project decommissioning would not have an adverse impact on the regional or local labor market. Expenditures for decommissioning, including payments to workers, would have a beneficial effect on the regional economy, similar to construction. However, the model used to estimate construction-related economic output cannot be applied to the decommissioning work, since the regional economy likely will experience substantial changes in the intervening years.

Environmental Justice

The environmental justice review determined that during the construction, operation, and maintenance phases of the Project, impacts related to air resources, geology and soils, hazards and hazardous materials, and noise would be limited to a small area surrounding the Project site and would not affect people that may be members of communities of concern to the environmental justice analysis. The potential for human health and environmental impacts associated with the Proposed Action to result in disproportionately high and adverse impacts on local and regional communities is described below. In each instance, impacts from Project decommissioning would be similar to those from Project construction.

Biological and Cultural Resources

As described in Section 3.6, *Cultural Resources*, no places were identified within the Project site where plants are gathered for use in traditional medicines and ceremonies or artisan materials are found, or where traditional subsistence systems are located. Therefore, the Proposed Action would not result in impacts related to the use of the sites' specific biological and cultural resources that would have disproportionately high and adverse impacts on communities of concern.

Recreation

Two existing OHV routes on the northern portion of the Project site would be closed for the duration of the Project, reducing access for recreational activities. Additionally, the Project site itself would not be available for dispersed recreational use. However, these recreational resources serve and are accessible to all residents of the region, and alternative recreational sites are equally accessible and available to residents of Baker and the rest of CT 103 as to other users. The BLM has no information suggesting that members of minority communities use these routes more than other OHV users, or that access to alternative sites would be disproportionately inconvenient or difficult for minority users. Therefore, this impact is not anticipated to be disproportionately high and adverse for the communities of concern.

Socioeconomic Effects and Economic Conditions

As described above, expenditures related to Project construction are expected to result in beneficial economic impacts to the surrounding region. The Applicant expects to hire local union labor for Project construction (Panorama Environmental, Inc., 2013). The BLM has no information suggesting that minority populations would not have equal access to Project-related job opportunities. If that were the case, some of the Project's potential economic benefits could be disproportionately distributed to non-minority workers and communities; however, there is no indication that this would occur.

The need for temporary housing for construction workers may increase demand for vacant housing and for short-term lodging facilities (hotels, motels, and camping sites). Similarly, the need for housing for permanent employees who may relocate to the local area also could increase the demand for housing to be purchased or rented. Such demands would result in positive impacts to owners of available vacant housing and short-term lodging, and negative impacts to those seeking to relocate into the surrounding areas by limiting the availability of remaining housing

options. This is not considered likely to be a disproportionately high or adverse impact to populations in the communities of concern because there is no indication that residential neighborhoods in the local area would be unequally affected by an increase in demand for both temporary and permanent housing.

Transportation

As described in Section 3.16, *Transportation and Travel Management*, construction-related traffic, both from worker commuting and transport of materials, temporarily would increase traffic levels on I-15 and the access roads to the Project site. Operation and maintenance of the Project also would result in a minor increase in traffic. No Project-related traffic increases would reduce the level of service (LOS) of I-15 in this area or cause traffic levels that would exceed the capacity of local roadways. These impacts would not be disproportionately high or adverse for populations within the communities of concern in the secondary study.

Visual Resources

As described in Section 3.18, *Visual Resources*, construction of the Proposed Action would result in short-term impacts from construction lighting and visible dust plumes, and adverse effects from large-scale visual disturbance in the landscape resulting from construction activities and equipment. During operation and maintenance, the Project may be a source of adverse visual impact as a large-scale visual disturbance that would introduce industrial components and facilities to the landscape. Due to the Project site's distance from populated areas, these impacts would not be disproportionately high or adverse for residents of Baker or other portions of CT 103 compared to impacts on other County residents or travelers on I-15.

Water Resources

As described in Section 3.19, *Water Resources*, construction, operation, and maintenance would not result in adverse groundwater supply impacts, nor would it result in wastewater discharges that could affect drinking water supplies or other water bodies. It could result in water quality impacts from the accidental release of water pollutants, such as surface sediments. Mitigation Measures 3.19-1 through 3.19-3 would reduce these impacts. The Proposed Action would not result in disproportionately high or adverse effects for residents of Baker or other parts of CT 103 because it would not adversely affect water resources that are used only or primarily by this community.

3.14.6.2 Alternative B

Alternative B would cause the same types of direct and indirect resource-related impacts as the Proposed Action. However, because the solar plant site would be smaller for Alternative B than for the Proposed Action (see Section 2.5.1), the magnitude of impacts related to workforce size and economic effects would be reduced compared to those of the Proposed Action. Also, for the same reasons as for the Proposed Action, Alternative B would not cause any disproportionately high or adverse environmental justice impacts on minority or low-income populations.

3.14.6.3 Alternative C

Alternative C would cause the same types of direct and indirect resource-related impacts as the Proposed Action, However, because the solar plant site would be smaller for Alternative C than for the Proposed Action (see Section 2.5.1), the magnitude of impacts related to workforce size and economic effects would be reduced compared to those of the Proposed Action. Also, for the same reasons as for the Proposed Action, Alternative C would cause no disproportionately high or adverse environmental justice impacts on minority or low-income populations.

3.14.6.4 Alternative D

Alternative D would cause the same types of direct and indirect resource-related impacts as the Proposed Action. However, because the solar plant site would be smaller for Alternative D than for the Proposed Action (see Section 2.5.1), the magnitude of impacts related to workforce size and economic effects would be reduced compared to those of the Proposed Action. Also, for the same reasons as for the Proposed Action, Alternative D would cause no disproportionately high or adverse environmental justice impacts on minority or low-income populations.

3.14.6.5 Alternative E: No Action/No Project

The No Action/No Project Alternative would not result in any of the socioeconomic impacts described above and therefore would not have any disproportionately high and adverse impacts to populations in the affected area. No impacts related to socioeconomics (including economic conditions) or to environmental justice would occur.

3.14.6.6 Alternative F: CEQA No Project

This alternative would have impacts similar to the Proposed Action or Alternatives B, C, or D, with the exception that no groundwater wells would be installed. This would result in a greater number of truck trips accessing the site during construction and operation to deliver water to the site as needed for dust suppression, panel washing, and other uses. The additional truck trips are not expected to have an effect on the socioeconomic impacts described above, with the possible exception that one or more additional jobs may result from the need for daily water deliveries to the site. Additionally, as described in Sections 3.2, *Air Resources*, and 3.16, *Transportation and Travel Management*, Alternative F would not result in substantial increases in air pollutant emissions, nor would it reduce the LOS of regional roadways. For the reasons described for other action alternatives, no impacts related to environmental justice would occur.

3.14.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would not result in any of the socioeconomic impacts described above and would not have any disproportionately high and adverse impacts to populations in the affected area. No impacts related to socioeconomics (including economic conditions) or to environmental justice would occur.

3.14.7 Cumulative Effects

The Proposed Action and alternatives would not cause any impact related to environmental justice; therefore, the Project would not cause or contribute to any cumulative impact in this regard.

The potential for cumulative socioeconomic impacts exists where the labor demand exceeds the labor supply, the imbalance results in an influx of workers to fill the positions, and the influx results in the housing demand exceeding the housing supply. In this confluence of events, potential cumulative socioeconomic impacts include increased housing prices, more crowded living situations, and/or poorer living conditions. For example, projects with overlapping construction schedules and/or operations could collectively result in a demand for labor that cannot be met by the region's existing labor pool, which could lead to an influx of non-local workers and possibly their dependents. This population increase could impact social and economic resources if there are insufficient housing resources and/or infrastructure and public services to accommodate the new residents' needs. Accordingly, the analysis below considers whether the cumulative increase in the demand for labor would result in an adverse cumulative jobs-housing imbalance in the region, and determines that because the cumulative labor demand is not expected to exceed the available labor supply, few workers would likely be seeking accommodations near the Project site or near other projects in the cumulative scenario. The analysis also determines that although there is low potential for population growth, the small amount of growth that may occur could affect the existing character of communities and have a beneficial impact on local and regional businesses.

The contributions of Alternatives B, C, and D to the cumulative impacts described below would be reduced compared to the Proposed Action in proportion to the reduced workforces and shorter construction periods required for each of the action alternatives, and the contribution of Alternative F would be the same as these action alternatives. Alternatives E and G would cause no impact related to socioeconomics, and so would not cause or contribute to any cumulative socioeconomic impact.

During construction, the Proposed Action could contribute to cumulative socioeconomic conditions in populated areas roughly within a 2-hour commute distance of the approved and reasonably foreseeable projects that could employ workers from any of the same communities as the Proposed Action. Thus, the geographic scope of the cumulative impacts analysis for the construction phase would extend as far east as Las Vegas, and west to Lancaster and Palmdale in Los Angeles County. By contrast, during the operation and maintenance phase, the geographic scope of the cumulative effects analysis includes communities roughly within a 1-hour commute distance, which includes communities along I-15 and CA-58 between Las Vegas and the Victorville-Hesperia region. The temporal scope of the cumulative impacts analysis includes the construction, operation and maintenance, and decommissioning phases of the Project.

Existing cumulative conditions (as described in Section 3.14.2, *Regional and Local Environmental Setting*) reflect the ongoing contributions to socioeconomic impacts caused by past projects.

3.14.7.1 Construction

Table 3.14-9 shows the currently available construction workforce data available for projects included in the cumulative scenario. Details of the Proposed Action are included for comparison. Workforce data for the communication sites (Project 7 in Table 3.1-3) is not publicly available, and no workforce is yet proposed for the active mining claims (Project 10 in Table 3.1-3); however, the construction workforces for these sites are assumed to be very low in comparison to the projects included in Table 3.14-9, and are not expected to have a noticeable effect on cumulative workforce demand. If all of the projects within the cumulative scenario were to be constructed at the same time as the Project, the combined average workforce would be 5,325 workers. Because the precise construction schedules for each project are currently unknown, this analysis assumes that the peak construction periods of the projects in the cumulative scenario would be of a similar length to the Project (3 months).

TABLE 3.14-9
AVERAGE AND PEAK CONSTRUCTION EMPLOYMENT FOR APPROVED AND REASONABLY FORESEEABLE PROJECTS

Project	MW	Non-Peak Workers	Peak Workers
Soda Mountain Solar	350	215	290
Silurian Valley Wind	200	(240)	300
Silurian Valley Solar	150	(90)	(125)
XpressWest Rail	N/A	3,000	3,900
Calnev Pipeline Expansion	N/A	550	660
Stateline Solar	300	400	600
Abengoa Mojave Solar	250	830	1,162
Total		**5,325**	**7,037**

NOTE: Worker numbers in parentheses have been estimated based on the average and peak worker counts per MW of similar projects in the absence of project-specific data.

SOURCE: BLM and San Bernardino County, 2012a, b; FRA, 2009; DOE LPO, 2011

Project developers would likely seek to minimize the construction occurring during the hottest summer months and may therefore stagger their construction periods accordingly. Consequently, some seasonality may be expected to occur as developers favor more construction during the region's cooler spring, fall, or winter months. It is assumed that peak construction needs for each of the projects would be approximately evenly spread throughout the 30-month period for cumulative construction-related impacts. If all of the projects experienced their peak construction during the 30-month cumulative impact period, the realistic "worst case condition" would be that a maximum of three projects would have peak labor needs during the same season. The mean peak workforce of the projects in Table 3.14-9 is approximately 1,000 workers, and the mean non-peak workforce is approximately 760 workers. This gives an average cumulative solar workforce of

approximately 6,040 workers.[2] Under the extremely improbable circumstance that peak construction of all seven planned projects happens concurrently, a maximum of approximately 7,000 construction workers would be required at one time.

Because not all of the cumulative projects would be under construction for the entire 30-month Project construction period, the actual cumulative construction workforce may be lower. However, it is reasonable to assume that other future projects that are not yet known for this Project's cumulative scenario may begin construction later in this time period. Therefore, the rounded single-season peak of approximately 6,000 construction workers is used in this analysis.

The Project's maximum potential contribution to this cumulative effect would be approximately 4.8 percent during its own peak construction period. The Project's average contribution to the cumulative impact would be approximately 3.6 percent during its non-peak construction.

Regional Labor Force Supply

The total work force of skilled construction workers currently living in San Bernardino County is estimated to be approximately 24,500, and in Clark County, 55,752 (Table 3.14-3). While most of the workers in Clark County are assumed to be concentrated in the Las Vegas region because 90 percent of the county's population lives in the Las Vegas CCD, as shown in Table 3.14-2, the Barstow and Victorville-Hesperia regions together account for only 20 percent of the population of San Bernardino County, and so are likely to have approximately 4,900 construction workers. Because the Lancaster-Palmdale region is also included in the construction geographic scope, but the EDD only reports on industry employment at the County level and Lancaster and Palmdale represent a small portion of Los Angeles County population but are similar in size to Barstow and Victorville-Hesperia when combined, the total regional construction labor force in the construction geographic scope is assumed to be approximately 65,000.

As described in Section 3.14.2, these areas have unemployment rates near 12 percent. When applied to the total labor force, this results in an anticipated 7,800 available construction workers for the construction cumulative scenario.

Future demand for 6,000 construction workers is not likely to exceed the capacity of the current skilled labor force within the geographic scope. Additionally, because of the temporary nature of construction work, the projects in the cumulative scenario would replace some current construction projects that are now employing skilled labor, and would not rely solely on the unemployed portion of the labor force.

Additionally, the employment needs of multiple projects increases the likelihood that both private and public sector training opportunities may arise to enable existing unemployed residents to develop the necessary skills required to serve the cumulative labor demand. Additionally, many

[2] Three projects at mean peak workforce and four projects at mean non-peak workforce. Final cumulative workforce estimates are rounded to reflect the uncertainty that results from making assumptions about projects for which data is not currently available.

construction tasks can be undertaken by less skilled workers. Some of the regional workforce currently employed in other sectors also could have the capabilities to qualify for Project construction work, which could result in an overall decrease in regional unemployment levels as workers transfer from other sectors and new vacancies are filled by existing unemployed residents.

Housing and Lodging Impacts within the Local Area

Because the cumulative demand for construction workers is not expected to exceed the available labor supply within the geographic area of cumulative consideration, it is not anticipated that those job positions would need to be filled by workers relocating into the region from elsewhere. However, the following discussion is provided to address the possibility that workers would relocate or engage in weekly commuting.

Given the numerous variables discussed above, it is difficult to project the extent of future weekly commuting or other in-migration that may occur based on the future cumulative labor needs within the region. The skilled construction labor force within the areas of San Bernardino County outside of the geographic scope is estimated to be approximately 19,600 (the remainder of the 24,500 total construction workers). This suggests that there is likely to be a considerable additional available labor force willing to commute weekly or to relocate temporarily to the area. Consequently, from a broader geographic and labor force perspective, no significant shortages of adequately skilled construction workers is foreseen, provided that adequate suitable housing is available for relocating near the work sites.

Any influx in construction labor to the area driven by the cumulative labor demand could create increased demand for temporary housing. As discussed in the previous construction impact analysis, private and public RV/campgrounds are not expected to be suitable or attractive lodging options for most construction workers seeking local accommodations, but could provide limited temporary housing options. There are expected to be approximately 5,200 vacant rental units and a similar number of hotel and motel rooms available in the portions of San Bernardino County that are within the geographic scope, and additional vacant units and commercial lodging are available in the Las Vegas and Lancaster-Palmdale areas for workers at project sites closer to those locations. Therefore, the existing rental units, hotels, and motels within the geographic scope are expected to be able to house any construction workers seeking local temporary housing as a result of the cumulative projects.

Irrespective of the availability of temporary housing, it may be expected that, even under future cumulative conditions, a relatively small proportion of construction workers would choose to relocate permanently to the local communities where they would be employed during construction. This is because many construction workers could choose to commute relatively long distances to their work sites rather than relocating, as indicated by the EPRI study (1982), and/or because they may expect to seek work within the more populated areas of San Bernardino or nearby counties in the future.

In summary, there is low potential for short-term adverse cumulative social and economic impacts associated with the demand for skilled construction labor for the cumulative projects proposed for future development within the geographic scope. Analysis suggests that future construction labor demand is not likely to exceed the existing local workforce within the geographic scope. Therefore, given the estimated availability of lodging and possible rental housing, it is not expected that there would be a shortage of adequate and suitable housing to meet all future construction worker temporary housing demand. No adverse social or economic impacts are anticipated related to housing demand.

Social Character

The influx of construction workers both commuting daily to project sites and those who could choose to temporarily live in the local area would not be likely to noticeably alter the social character and environment within the affected communities, with the possible exception of Baker. As shown in Table 3.14-2, there were 77 vacant housing units for rent within CT 103 (most of which are assumed to be in Baker, the only developed community within the tract) in 2010. An in-migration of workers seeking to rent these available units could represent a noticeable (approximately 10 percent) increase in the town's population and could result in less available housing and increased housing prices, demand for public facilities and services, and traffic. Increased housing prices could benefit owners of rental or temporary housing, but could negatively affect local residents seeking housing. Because construction would be temporary, such effects would only occur during the construction periods of projects contributing to temporary population growth in Baker. Because this Project and the Silurian Valley Wind and Solar projects would be the nearest cumulative projects to Baker, it is likely that these would have the greatest contributions to potential increases in Baker's population and to visitor use of businesses and other establishments in Baker.

Economic Effects

The potential minor influx of construction workers to these communities would be accompanied by an increase in economic activity from their spending in local business establishments. In addition, the planned new development projects would likely also make some purchases from local businesses for construction materials and supplies and various kinds of services. As shown in Table 3.14-7, Project construction is estimated to have a total economic output of over $750 million, which would be realized primarily in San Bernardino County. Given that many of the other projects in the cumulative scenario are of a similar type and scale to the Project, it is likely that their economic outputs would be similar in scale and geographic distribution. Consequently, the cumulative economic effect of the construction of these projects would be primarily beneficial, although any increased demand for housing and subsequent decrease in supply could increase housing prices in the local area, a potential adverse effect for current residents or others seeking to move into the area. Overall, the cumulative social and economic effect of the construction of the cumulative scenario projects would be generally beneficial.

3.14.7.2 Operation and Maintenance

Cumulative Operation and Maintenance Labor Needs

As shown in Table 3.14-10, if full build-out of the planned cumulative scenario development occurs, the future cumulative operational employment in the region would be approximately 755. The Project's 40 operational jobs represents an approximately 5.3 percent contribution to the cumulative operation- and maintenance-related need.

TABLE 3.14-10
OPERATIONAL EMPLOYMENT FOR CUMULATIVE SCENARIO PROJECTS

Project	Employees
Soda Mountain Solar	40
Silurian Valley Wind	12
Silurian Valley Solar	(20)
XpressWest Rail	400
Calnev Pipeline Expansion	0
Stateline Solar	10
Abengoa Mojave Solar	80
Ivanpah Solar	90
I-15 Joint Port of Entry	100
Total	752

NOTE: Worker numbers in parentheses have been estimated based on the employment counts of similar projects in the absence of project-specific data.

SOURCE: BLM and San Bernardino County, 2012a, b; BLM, 2010, 2011; FRA, 2009; DOE LPO, 2011

Regional Labor Force Supply

As shown in Table 3.14-3, there are 48,200 workers in the "Transportation, Warehousing & Utilities" industry group in San Bernardino County, for a total of approximately 9,640 workers in the portion of the County within the geographic scope. Although not all workers in this category may possess the skills required for operation and maintenance of the projects included in the cumulative scenario, the transferability of other skills, on-the-job and local community college training opportunities, and the lower skilled qualification requirements for some of the jobs suggest that there would be many others outside this category who would be able to meet the cumulative operational labor needs. Therefore, in the absence of more precise data on available skills, this industry group is used as the available labor pool for this analysis. Based on current unemployment rates, it is assumed that approximately 1,157 of these workers would be available to meet operational labor needs (this number is rounded to 1,200 to account for the low level of precision inherent in the preceding assumptions). Therefore, there is likely to be sufficient available labor to meet the cumulative operational need.

Housing and Lodging Impacts within the Local Area

Because there would be sufficient available labor, limited relocation of operational workers is expected to occur (though some would likely be recruited from outside the local area due to the need for specialized skills). As shown in Table 3.14-2, there are approximately 9,000 vacant housing units for sale or rent in the operational geographic scope, which would be sufficient to accommodate the housing needs of these workers and their families. Most of this housing is in the Victorville-Hesperia CCD, and would be sufficient accommodate the XpressWest project's 400 operational personnel, who would be located at that project's Victorville operations center (FRA, 2009).

Social Character

In the cumulative scenario, only a few operation and maintenance workers would be expected to relocate to the study area. The relatively limited number of new residents would not be expected to result in any noticeable change to the local communities' social composition or character. The existence and operation of the projects themselves could result in changes to the character and culture of the area by converting open space, one of the primary land uses in San Bernardino County, to solar and wind energy generating facilities, and by adding a major transportation mode to an existing major regional corridor (I-15).

Economic Effects

The future operations of the cumulative projects would also generate significant annual economic benefits in local employment, direct and indirect spending at local businesses, and positive sales and other tax benefits for the local area. Consequently, the cumulative economic effect of the future operations of these projects would be minor and primarily beneficial, although any increased demand for housing and subsequent decrease in supply could increase housing prices in the local area, a potentially adverse effect for current residents or others seeking to move into the area.

Overall, the cumulative social and economic effect of the future operations of the cumulative scenario projects would be minor and generally beneficial.

3.14.7.3 Decommissioning and Restoration

Evaluating the Project's cumulative impacts when future facility decommissioning occurs is highly speculative. Decommissioning is expected to occur after 30 years of operation. It is not possible to project with confidence the likely future social and economic conditions of the local and regional study area. Similarly, the extent to which the projects in the cumulative scenario would undergo decommissioning concurrently is unknown.

Nonetheless, Project decommissioning is expected to require a workforce similar to the construction phase, and the Project is expected to be one of many similar renewable energy projects within the County. As such, its contribution to cumulative social and economic effects would be proportional to: (a) its size relative to the other development projects in the region; and

(b) the collective size of projects undergoing decommissioning or construction at that time. Decommissioning would not likely overlap with as many projects as construction, and in over 30 years' time, based on regional population growth trends, it is likely that there would be more local workers and more temporary housing options available to accommodate decommissioning needs. Therefore, decommissioning would have a reduced effect relative to construction.

3.14.8 Mitigation Measures

No mitigation measures are required.

3.14.9 Residual Effects

Because no APMs have been proposed and no mitigation measures are required to address potential impacts to socioeconomics or environmental justice, residual effects would be the same as those described in Sections 3.14.6 and 3.14.7.

3.14.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section XIII, a project would have a significant impact on population and housing if it would:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

b) Displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere; or

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

3.14.10.1 Alternative A: Proposed Action

a) Impact Socio-1: The Proposed Action would not induce substantial population growth through the extension of infrastructure. (Less than Significant)

The Project does not propose new homes, its construction and decommissioning workforces would be temporary and likely would consist of local workers, and its long-term workforce would be limited to up to 40 employees. Many long-term employees could come from within San Bernardino County, and if recruited from outside the County, could be accommodated by existing housing in the local area. Therefore, it would not directly induce substantial population growth.

The Project would not indirectly induce substantial population growth through the extension of infrastructure because although it would produce additional electricity and increase service capacity, it is intended to meet the demand for energy that is already projected based on growth in demand for electricity in LADWP's service area, and therefore would not be growth-inducing. This impact would be less than significant. Accordingly, no mitigation measures are

recommended. This less-than-significant, Project-specific impact related to the extension of infrastructure would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because the energy-generating cumulative projects similarly are intended to meet existing demand.

b) The Proposed Action would not displace existing housing units, necessitating the construction of replacement housing elsewhere. (No Impact)

There is no existing housing on the Project site. The Project would not displace any existing housing units, and therefore would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because the Proposed Action would cause no impact related to criterion b, it would not cause or contribute to any cumulative effect relating to the displacement of housing.

c) The Proposed Action would not displace people, necessitating the construction of replacement housing elsewhere. (No Impact)

There are no residents on the Project site. The Project would not displace any people, and therefore would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because the Proposed Action would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to the displacement of people.

3.14.10.2 Alternative B

a) Impact Socio-B1: Alternative B would not indirectly induce substantial population growth through the extension of infrastructure. (Less than Significant)

Alternative B does not propose new homes, and its temporary construction and decommissioning workforces, as well as its long-term operation and maintenance workforce, would be approximately the same as or somewhat smaller than those of the Proposed Action. Therefore, like the Proposed Action, it would not directly induce substantial population growth. Additionally, Alternative B would produce less renewable energy than the Proposed Action, and for the same reasons described above, would not indirectly induce population growth through the extension of new infrastructure. This impact would be less than significant. Accordingly, no mitigation measures are recommended. This less-than-significant, Project-specific impact related to the extension of infrastructure would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because the energy-generating cumulative projects similarly are intended to meet existing demand.

b) Alternative B would not displace existing housing units, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative B would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any existing housing units, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative B

would cause no impact related to criterion b, it would not cause or contribute to any cumulative effect relating to the displacement of housing.

c) Alternative B would not displace people, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative B would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any people, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative B would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to the displacement of people.

3.14.10.3 Alternative C

a) Impact Socio-C1: Alternative C would not indirectly induce substantial population growth through the extension of infrastructure. (Less than Significant)

Alternative C does not propose new homes, and its temporary construction and decommissioning workforces, as well as its long-term operation and maintenance workforce, would be approximately the same as or somewhat smaller than those of the Proposed Action. Therefore, like the Proposed Action, it would not directly induce substantial population growth. Additionally, Alternative C would produce less renewable energy than the Proposed Action, and for the same reasons described above, would not indirectly induce population growth through the extension of new infrastructure. This impact would be less than significant. Accordingly, no mitigation measures are recommended. This less-than-significant, Project-specific impact related to the extension of infrastructure would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because the energy-generating cumulative projects similarly are intended to meet existing demand.

b) Alternative C would not displace existing housing units, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative C would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any existing housing units, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative C would cause no impact related to criterion b, it would not cause or contribute to any cumulative effect relating to the displacement of housing.

c) Alternative C would not displace people, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative C would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any people, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative C would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to the displacement of people.

3.14.10.4 Alternative D

a) Impact Socio-D1: Alternative D would not indirectly induce substantial population growth through the extension of infrastructure. (Less than Significant)

Alternative D does not propose new homes, and its temporary construction and decommissioning workforces, as well as its long-term operation and maintenance workforce, would be approximately the same as or somewhat smaller than those of the Proposed Action. Therefore, like the Proposed Action, it would not directly induce substantial population growth. Additionally, Alternative D would produce less renewable energy than the Proposed Action, and for the same reasons described above, would not indirectly induce population growth through the extension of new infrastructure. This impact would be less than significant. Accordingly, no mitigation measures are recommended. This less-than-significant, Project-specific impact related to the extension of infrastructure would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because the energy-generating cumulative projects similarly are intended to meet existing demand.

b) Alternative D would not displace existing housing units, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative D would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any existing housing units, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative D would cause no impact related to criterion b, it would not cause or contribute to any cumulative effect relating to the displacement of housing.

c) Alternative D would not displace people, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative D would be developed within the same ROW boundary as the Proposed Action, and therefore would not displace any people, and would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative D would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to the displacement of people.

3.14.10.5 Alternative E: No Action/No Project

Because it would not result in development of the Project site, or in changes at or near the Project site that could affect existing communities, housing, or residents, Alternative E would result in no impact to population and housing. Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect to population and housing.

3.14.10.6 Alternative F: CEQA No Project

a) Impact Socio-F1: Alternative F would not indirectly induce substantial population growth through the extension of infrastructure. (Less than Significant)

Alternative F does not propose new homes, and its temporary construction and decommissioning workforces, long-term operation and maintenance workforce, and renewable energy generating capacity would be the same as those of the Proposed Action and any of the action alternatives. Therefore, like the Proposed Action, it would not directly or indirectly induce substantial population growth. This impact would be less than significant. No mitigation measures are recommended. This less-than-significant, Project-specific impact related to the extension of infrastructure would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because the energy-generating cumulative projects similarly are intended to meet existing demand.

b) Alternative F would not displace existing housing units, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative F would necessitate the use of an off-site water source, but would not displace any existing housing units, and therefore would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative F would cause no impact related to criterion b, it would not cause or contribute to any cumulative effect relating to the displacement of housing.

c) Alternative F would not displace people, necessitating the construction of replacement housing elsewhere. (No Impact)

Alternative F would necessitate the use of an off-site water source, but would not displace any people, and therefore would not necessitate the construction of replacement housing elsewhere. No impact would occur. Because Alternative F would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to the displacement of people.

3.14.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Because it would not result in development of the Project site, or in changes at or near the Project site that could affect existing communities, housing, or residents, Alternative G would result in no impact to population and housing. Because it would cause no impact to any of the CEQA criteria identified above, Alternative G would not cause or contribute to any cumulative effect to population and housing.

References

Bureau of Economic Analysis (BEA), 2010. CA25N Total full-time and part-time employment by NAICS industry, Clark County. [http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1&isuri=1&acrdn=5] Accessed October 29, 2012.

Bureau of Land Management (BLM), 2005. H-1601-1. Land Use Planning Handbook (March, 2011).

BLM, 2010. Ivanpah Solar Electric Generating System Final Environmental Impact Statement. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.19048.File.dat/1-CDCA-Ivanpah-Final-EIS.pdf]

BLM, 2011. Camping in the Desert. [http://www.blm.gov/ ca/st/en/fo/barstow/camping.html] Accessed October 29, 2012.

BLM and San Bernardino County, 2012a. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). March. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/Barstow/calnev_pipeline.Par.95926.File.dat/DEIS-EIR%20for%20Calnev%20Pipeline%20Expansion%20Project_FOR%20CD3.pdf]

BLM and San Bernardino County, 2012b. Stateline Solar Farm Project Draft Environmental Impact Statement/Environmental Impact Report. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.47817.File.dat/Stateline%20Solar%20Farm%20Draft%20EIS-EIR%20-%20Nov%202012_508.pdf]

California Department of Finance (CA DOF), 2005. Revised County Population Estimates and Components of Change by County, July 1, 1990-2000. February.

California Department of Finance (CA DOF), 2012. Interim Projections of Population for California: State and Counties July 1, 2015 to 2050 (in 5-year increments). Demographic Research Unit. May 7. [http://www.dof.ca.gov/research/demographic/reports/projections/interim/documents/Final_2012_Interim_Proj_Web.xls] Accessed October 26, 2012.

California Employment Development Department (EDD), 2012a. San Bernardino County Industry Employment & Labor Force - by Annual Average March 2011 Benchmark. [http://www.calmis.ca.gov/file/indhist/sanbrhaw.xls] Accessed October 29, 2012.

California Employment Development Department (EDD), 2012c. Historical Civilian Labor Force San Bernardino County. [http://www.calmis.ca.gov/file/lfhist/sanbrhlf.xls] Accessed October 29, 2012.

California Employment Development Department (EDD), 2012d. Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) Labor Market Information. [http://www.calmis.ca.gov/file/lfmonth/rive$pds.pdf]

California Employment Development Department (EDD,. 2012b. Riverside San Bernardino Ontario MSA Industry Employment & Labor Force - by Annual Average March 2011 Benchmark. [http://www.calmis.ca.gov/file/indhist/rive$haw.xls] Accessed October 29, 2012.

Electric Power Research Institute (EPRI), 1982. Socioeconomic Impacts of Power Plants.

Good Sam Club, 2012. Victorville Shady Oasis Kampground. [http://www.goodsamclub.com/travel/campgroundsandrvparks/GeneralInfo.aspx?city=Victorville&state=CA&country=USA&cgid=100006801] Accessed October 29, 2012.

Nevada Department of Employment, Training, and Rehabilitation, 2012. Labor Force. [www.nevadaworkf orce.com/cgi/dataAnaly sis/LabForceReport.asp] Accessed October 29, 2012.

Nevada State Demographer's Office, 2011. Nevada County Population Projections 2010 to 2030. October [http://tax.state.nv.us/documents/2011%20Projections.pdf]

Old Grove Properties LLC, 2010. Welcome to the Barstow Calico KOA. [http://www.barstowcalicokoa.com/] Accessed October 29, 2012.

Panorama Environmental, Inc., 2013. Soda Mountain Solar Economic Impact Analysis Using IMPLAN. January.

Regional Economics Consulting, 2013. The Economic Impacts of the Soda Mountain Solar Project. June.

RVparking.com, 2012. Shady Lane RV Camp. [http://www.rvparking.com/ca/barstow/shady-lane-rv-camp] Accessed October 29, 2012.

San Bernardino County, 2007. County of San Bernardino 2007 General Plan, as amended.

San Bernardino County, 2010. Comprehensive Annual Financial Report Year Ended June 30, 2010. [http://www.sbcounty.gov/atc/pdf/onlinedocs/0000_00_00_152_2009-2010%20CAFR.pdf]

Southern California Association of Governments (SCAG), 2012. Adopted 2012 RTP Growth Forecast. [http://www.scag.ca.gov/forecast/downloads/excel/2012AdoptedGrowthForecast.xls] Accessed October 26, 2012.

Tra, Constant I., and Christopher Drury, 2012. Population Forecasts: Long-Term Projections for Clark County, Nevada 2012-2050. Center for Business and Economic Research University of Nevada, Las Vegas. June. [http://cber.unlv.edu/reports/2012PopulationForecasts.pdf]

tripadvisor.com, 2012a. Baker Hotels. [http://www.tripadvisor.com/Hotels-g32036-Baker_California-Hotels.html Accessed October 29, 2012.

tripadvisor.com, 2012b. Barstow Hotels. [http://www.tripadvisor.com/HACSearch?geo=60902#02,1351541044603,rad:S25mi] Accessed October 29, 2012.

tripadvisor.com, 2012c. Victorville Hotels. [http://www.tripadvisor.com/HACSearch?geo=33224#02,1351541255609,rad:S25mi] Accessed October 29, 2012.

U.S. Census Bureau. 2010a. 2010 Census - Census Tract Reference Map: San Bernardino County, CA, Map 8. [http://www2.census.gov/geo/maps/dc10map/tract/st06_ca/c06071_san_bernardino/DC10CT_C06071_008.pdf]

U.S. Census Bureau, 2010b. 2010 Census: Profile of General Population and Housing Characteristics.

U.S. Census Bureau, 2010c. 2006-2010 American Community Survey 5-Year Estimates. Selected Economic Characteristics.

U.S. Census Bureau, 2011. Poverty Thresholds for 2010 by Size of Family and Number of Related Children Under 18 Years. [http://www.census.gov/hhes/www/poverty/data/threshld/thresh10.xls] Accessed April 12, 2013.

U.S. Department of Energy (DOE) Loan Programs Office (LPO), 2011. Abengoa Mojave Solar Project Environmental Assessment. [https://lpo.energy.gov/wp-content/uploads/2010/10/Abengoa-Mojave-Final-EA.pdf]

U.S. Department of Transportation Federal Railroad Administration (FRA), 2009. DesertXpress Draft EIS, Chapter 3. [http://www.fra.dot.gov/Elib/Document/2626] Accessed April 16, 2013.

U.S. Environmental Protection Agency (USEPA), 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April.

U.S. Executive Office of the President. Council on Environmental Quality (CEQ), 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. December 10.

CEQ, 2005. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. Reprint 40 CFR Parts 1500-1508.

U.S. Office of Management and Budget, 1978. "Statistical Policy Directive No. 14: Definition of Poverty for Statistical Purposes." Reproduced in U.S. Census Bureau, "Poverty—Experimental Measures." [http://www.census.gov/hhes/povmeas/methodology/ombdir14.html] Accessed April 12, 2013.

3.15 Special Designations

3.15.1 Introduction

The following discussion addresses existing special designations within the general vicinity of the Project and describes existing laws and regulations relevant to those areas. For the purposes of this analysis, the study area has been defined as the area within 10 miles of the Project. See Figure 3.13-1.

Special designations are either designated by an Act of Congress or by Presidential Proclamation, or created under Department of the Interior or BLM administrative procedures. Two systems of federally managed lands are present in the general vicinity of the Project. The first is the National Park System, administered by the NPS, all of which are specially designated. The second is the National System of Public Lands, administered by the BLM. Within the National System of Public Lands, significant special designations in the BLM's National Landscape Conservation System include: National Monuments, National Conservation Areas, Cooperative Management and Protection Areas, National Wilderness Areas, Wilderness Study Areas, National Scenic and Historic Trails, Wild and Scenic Rivers, Outstanding Natural Areas, Forest Reserves, or any other special designations lands described in the Omnibus Public Lands Management Act of 2009 (PL 111-11 §2002(b)) (BLM, 2013). Other BLM special designations include Areas of Critical Environmental Concern (ACECs), Scenic and Back Country Byways, wildlife management areas and wildlife viewing sites, wild horse and burro ranges, and other special designations identified in BLM Land Use Planning Handbook - H-1601, Chapter III (BLM, 2005).

3.15.2 Regional and Local Environmental Setting

3.15.2.1 Regional Setting

The Project would be situated in a region where the Mojave, Sonoran, and Great Basin Deserts converge. This region is rich with unique desert landscapes. Archeological and historical remnants also demonstrate the importance of the area in the history of western exploration and development. The importance of these landscapes has long been nationally recognized. In 1980 much of the region was designated as the California Desert Conservation Area (CDCA), with the area adjacent to the Project further recognized as the East Mojave National Scenic Area (EMNSA) managed by the BLM. In 1994, the EMNSA designation was removed and this area became part of the Mojave National Preserve, managed by the NPS.

3.15.2.2 Project Setting

The Project site generally is surrounded by the Soda Mountain Wilderness Study Area (WSA) to the north and west, and the Mojave National Preserve to the east. Neither of these, nor any of the special designations described above, is present within the Project site. Special designations in the general vicinity of the Project site are shown in Figure 3.15-1 and discussed in the following sections.

3.15.2.3 Areas of Critical Environmental Concern

There are three ACECs in the general vicinity of the Project. The closest is the 10,226-acre Cronese Lakes ACEC, designated to protect cultural resources and wildlife habitat. The eastern boundary is approximately 3 miles west of the Project. Cronese Lakes ACEC is included within the boundaries of the Soda Mountain WSA.

Afton Canyon Natural Area is designated as an ACEC (referred to as Afton Canyon ACEC) to protect plant and wildlife habitat, and to preserve scenic values of the riparian area within the Afton Canyon. The ACEC is 4,726 acres in size, of which the closest boundary is approximately 9 miles southwest of the Project. Afton Canyon itself is approximately 12 miles from the Project. Afton Canyon ACEC is within the boundaries of the 43,346-acre BLM-managed Afton Canyon Special Recreation Area (BLM, 1999, Table 15, pg. 103).

The Mesquite Hills/Lucero Hills ACEC is 5,002 acres in size and has been designated to protect prehistoric values. This ACEC is located approximately 8 miles south of the Project near the southern boundary of the 24,959-acre Rasor OHV Recreation Area (BLM, 1980, Table 15, pg. 103).

3.15.2.4 National Preserves

Mojave National Preserve is a 1.6 million-acre unit of the National Park System, established by Congress on October 31, 1994 through the CDPA. The Preserve is a vast expanse of desert lands that represents a combination of Great Basin, Sonoran, and Mojave desert ecosystems. This combination allows a visitor to experience a wide variety of desert plant life in combinations that exist in such proximity nowhere else in the United States (NPS, 2002, pg. 2). National Preserve is a designation applied by the United States Congress to protected areas that have characteristics normally associated with U.S. National Parks, but where certain activities not allowed in National Parks are permitted (NPS, 2013). Within Mojave National Preserve, permitted activities include hunting, camping in certain undeveloped areas, and grazing (NPS, 2002).

3.15.2.5 National Historic Trails

The National Trails System Act (PL 90-543, October 2, 1968) and amendments recognize historic, scenic, and recreational routes and provide for the protection and interpretation of these trails for public enjoyment. Comprehensive Management Plans are developed for National Trails by the administrating agency.

The Old Spanish National Historic Trail (NHT) and a connecting trail, the Mojave Road, are in the vicinity of the Project. The Old Spanish NHT was designated by Congress in 2002. The trail, consisting of four routes, runs through New Mexico, Colorado, Arizona, Utah, Nevada, and California. The BLM and NPS administer the Old Spanish NHT together to encourage preservation and public use. The Northern Route (also known as the Main Route) of the Old Spanish NHT was first blazed in 1831 and generally parallels I-15, approximately 10 miles to the north of the Project site, including the Spanish Canyon/Impassable Pass segment. The branch known as the Mojave Road is a 188-mile crossing of the Mojave Desert long used by area Indians

and by Spanish explorers and missionaries (NPS and BLM, 2012) Mojave Road traverses Mojave National Preserve and Afton Canyon ACEC. Mojave Road is within 2 miles of the Project where it intersects Rasor Road. Through this section, it is contiguous with the Armijo Route of the Old Spanish NHT (BLM, 2006).

3.15.2.6 Wilderness Areas

Wilderness Areas are congressionally designated and are managed pursuant to the federal Wilderness Act of 1964 (16 USC §§1131-1136) and the specific legislation establishing each Wilderness Area. Federal agencies are authorized to manage Wilderness Areas for the public's use and enjoyment in a manner that will leave such areas unimpaired for future use and enjoyment as "wilderness" by providing for their protection and the preservation of their wilderness character.

There is one designated federal Wilderness Area in the general vicinity of the Project. In 1994, the CDPA designated 695,200 acres of Mojave National Preserve as wilderness. The Zzyzx area and Soda Dry Lake, a vast desiccated playa of a once great Ice Age lake, is the closest portion of the Mojave National Wilderness to the Project, and is located less than 1 mile from the Project's northern array (NPS, 2012).

3.15.2.7 Wilderness Study Areas

WSAs are areas "under consideration" by Congress as potential wilderness, and, until Congress designates them as Wilderness or releases them from study, are managed in a manner that does not impair the suitability of such areas to be designated as Wilderness (BLM, 2012a).

In 1990, the BLM published the "California Statewide Wilderness Study Report." Study Reports for WSAs in the general vicinity of the Project are found in Volume 5, Part 4 of this statewide effort (BLM, 1990). There are two WSAs within the general vicinity of the Project: Soda Mountains WSA and Cady Mountains WSA. The Soda Mountains WSA (CDCA-242) has 80,430 acres managed by the BLM (BLM, 2010). Approximately 90 percent of the 7,257-acre Cronese Lakes ACEC is within the boundary of this WSA. The southern boundary of the WSA generally parallels I-15, and the northern portion of the Project site is located between I-15 and the WSA. In 1990, the BLM published a wilderness study report evaluating whether the Soda Mountains WSA and other WSAs should be designated as Wilderness. The study recommended that the attributes of the Soda Mountains WSA were not such as to justify designating the area as Wilderness.

Cady Mountains WSA (CDCA-251) has 84,400 acres managed by the BLM (BLM, 2010). The northern boundary of the WSA is situated approximately 8 miles southwest of the Project, immediately south of Afton Canyon ACEC and north of Interstate 40.

In 1994, the status of WSAs was addressed in the CDPA (PL 103-344, §104), the CDPA specifically did not release Soda Mountains WSA or Cady Mountains WSA from WSA protection and the requirements of Section 603(c) of FLPMA.

3.15.2.8 Lands with Wilderness Characteristics

The immediate area encompassed by the Project was identified on the March 31, 1979, California Statewide Wilderness Inventory Map as an "unnumbered roadless area that does not contain 5,000 acres of Public Lands and does not possess values meeting Wilderness Act Section 2(c) criteria" (BLM, 1979a) and thus was not found to contain lands with wilderness characteristics in the original inventory of the Project area (BLM, 1979b).

Section 201 of FLPMA requires the BLM to maintain on a continuing basis an inventory of all public lands and their resources and other values, which includes wilderness characteristics. It also provides that the preparation and maintenance of the inventory shall not, of itself, change or prevent change of the management or use of public lands. Regardless of past inventory, the BLM must maintain and update its inventory of wilderness resources on public lands as necessary. In some circumstances, conditions relating to wilderness characteristics may have changed over time, and an area that was once determined to lack wilderness characteristics may now possess them. The BLM will determine when it is necessary to update its wilderness characteristics inventory. One of the circumstances that require the BLM to consider whether to update a wilderness characteristics inventory is when the BLM is analyzing a project that could impact wilderness characteristics. Since the Proposed Action and alternatives in this analysis could impact wilderness characteristics, the inventory was updated for the Project area and surrounding lands in 2012, per BLM policy and guidance found in Manual 6310, Conducting Wilderness Characteristics Inventory on BLM Lands, and Manual 6320, Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process. No lands with wilderness characteristics were found in the Project area so this issue will not be discussed further in the analysis. The determination of these findings in contained in Appendix F.

3.15.3 Applicable Laws, Regulations, Plans, and Standards

3.15.3.1 Federal

The following summarizes the federal regulations, plans and standards that would be applicable to the special designations on BLM- and NPS-administered lands on and in the study area.

Federal Land Policy Management Act of 1976

FLPMA (Public Law 94-579, October 21, 1976) is called the BLM Organic Act because it consolidates and articulates the BLM's management responsibilities. Many land and resource management authorities were established, amended, or repealed by FLPMA, and it proclaimed multiple use, sustained yield, and environmental protection as the guiding principles for public land management (BLM, 2001).

Several sections of FLPMA provide guidance regarding the establishment, management, and inventory of resource values which are considered for special designations.

Section 202(c)(3) requires the BLM, through the land use planning system, to "give priority to the designation and protection of Areas of Critical Environmental Concern." In Section 103(a), an ACEC is defined as the following:

> *An area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.*

Section 603(a) of FLPMA required the BLM to conduct the original inventory of wilderness characteristics, which was completed in 1979, while Section 603(c) states that "once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act (16 USC §1131 et seq.) which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area."

Wilderness Act of 1964

The Wilderness Act (Public Law 88-577; September 3, 1964) is the legislation authorizing the establishment and management of the Mojave Wilderness in the vicinity of the Project. Section 4(a) states:

> *…each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.*

National Trails System Act

The National Trails System Act (Public Law 90-543, October 2, 1968) was established:

> §2(a) *in order to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation, trails should be established (i) primarily, near the urban areas of the Nation, and (ii) secondarily, within scenic areas and along historic travel routes of the Nation which are often more remotely located.*

The National Trails System includes:

> §2(a)(3) *National historic trails, which will be extended trails which follow as closely as possible and practicable the original trails or routes of travel of national historic significance* (NPS, 2009).

California Desert Protection Act of 1994

The CDPA (Public Law 103-433, October 31, 1994) Section 502 designated the 1.6 million-acre Mojave National Preserve, to be managed by NPS, including the 695,200 acres of Wilderness within the Preserve.

The CDPA Section 102 also designated 69 areas as components of the National Wilderness Preservation System on BLM-managed public lands in the California Desert. CDPA Section 103(d) further states that there are no buffer zones designated along with the wilderness areas: "The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness area shall not, in itself, preclude such activities or uses up to the boundary of a wilderness area."

While none of the 69 designated areas is in the general vicinity of the Project, CDPA Section 104 did maintain the WSA status for the Soda Mountains and Cady Mountains WSAs. These areas continue to be subject to Section 603(c) of FLPMA, pertaining to the management of these areas "in a manner that does not impair the suitability of such areas for preservation as wilderness."

Omnibus Public Lands Management Act of 2009

The Omnibus Public Lands Management Act (Public Law 111-11, March 30, 2009) §2002(a) established the National Landscape Conservation System in order "to conserve, protect, and restore nationally significant lands that have outstanding cultural, ecological and scientific values for the benefit of current and future generations" to be managed by the BLM. Section 2002(c) directed the BLM "to manage the system in accordance with any applicable law (including regulations) relating to any of component of the system in a manner that protects the values for which the components of the system were designated." The public lands within the CDCA and components of the National Wilderness Preservation System are areas included under this authorization.

California Desert Conservation Area Plan

The CDCA is a 25 million-acre expanse of land designated by Congress in 1976 through §601 of FLPMA. The BLM administers about 10 million of those acres. When Congress created the CDCA, it recognized its special values, and the need for a comprehensive plan for managing the area.

The CDCA Plan recognized the need to maintain and perpetuate wilderness resources, including plants and animals indigenous to the area, and to the extent consistent provide the above for opportunities for public use, enjoyment, and understanding, and the unique experiences dependent upon a wilderness setting, including maintaining access to these areas. The plan also directed managers to consider valid nonconforming uses and activities in the management of the wilderness so as to have the least possible adverse effect and/or wherever possible a positive effect (BLM, 1999; p. 50).

In addition, the plan established ACECs as a value management tool for the protection of special values, including cultural resources, prehistoric archaeological features, wildlife habitat, and sensitive plant species. Prior to designation, management prescriptions are developed for each

proposed ACEC. These prescriptions are site-specific and include actions that the BLM has the authority to carry out, as well as recommendations for actions that the BLM does not have direct authority to implement, such as cooperative agreements with other agencies and mineral withdrawals (BLM, 1999).

Additional discussion regarding management prescriptions of specific ACECs are found in Sections 3.3, *Biological Resources – Vegetation* and 3.4, *Biological Resources – Wildlife*; and 3.6, *Cultural Resources.*

West Mojave Plan

The West Mojave (WEMO) Plan, an amendment to the CDCA Plan, adjusted the boundary of the Afton Canyon ACEC and changed its multiple-use class designation from M to L.

Mojave National Preserve General Management Plan

The NPS developed the General Management Plan in 2002 to guide the overall management strategy for the 1.6 million-acre Mojave National Preserve for a 10- to 15-year period. The plan focuses on the purposes of the Preserve, its significant attributes, what activities are appropriate within these constraints, and resource protection strategies, as well as its mission in relation to the overall mission of the NPS (NPS, 2002).

BLM Manual 6310, Conducting Wilderness Characteristics Inventory on BLM Lands (Public)

This manual contains the BLM's policy and guidance for conducting wilderness characteristics inventories under Section 201 of FLPMA. This policy does not address Wilderness Areas designated by Congress or WSAs pending before Congress. (BLM, 2012b)

BLM Manual 6320, Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process (Public)

This manual section contains the BLM's policy and guidance for conducting and maintaining wilderness characteristics inventories under Section 201 of FLPMA and for considering lands with wilderness characteristics in the land use planning process under FLPMA and other applicable law. Regardless of past inventory, the BLM must maintain and update as necessary its inventory of wilderness characteristics on public lands (BLM, 2012c).

BLM Manual 6330, Management of Wilderness Study Areas (Public)

This manual provides the line manager and program staff professionals with general policies for the administration and management of WSAs. The manual outlines procedures to ensure the Congressional mandate to manage WSAs "so as not to impair the suitability of such areas for preservation as wilderness" will be met (BLM, 2012a).

BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (Public)

This manual provides the line manager and program staff professionals with policies for the management of National Scenic and Historic Trails. Specifically, this manual identifies requirements for the management of trails undergoing National Trail Feasibility Study; trails that are recommended as suitable for National Trail designation through the National Trail Feasibility Study; inventory, planning, management, and monitoring of designated National Scenic and Historic Trails; and data and records management requirements for National Scenic and Historic Trails (BLM, 2012d).

3.15.3.2 State and Local

The BLM considers potential impacts of proposed actions to lands with special designations as part of its public land planning and management responsibilities consistent with the National System of Public Lands, including the laws and standards described above. These special federal designations do not govern state or local land use decision-making, and no state or local laws, regulations, plans, or standards apply to them.

3.15.4 Analytical Methodology

The impact analysis that follows focuses on whether construction, operation, maintenance, and decommissioning of the Project would conflict with the status or management goals of the special designation areas on or within the 10-mile radius of the Project site. These special designation areas include portions of one National Preserve, one National Historic Trail, one National Wilderness Area, two Wilderness Study Areas, and three ACECs.

This analysis reviews the Project relative to the specific legislation and agency guidance documents that pertain to the designation and management of special designation areas. These include FLPMA, the Wilderness Act of 1964, National Trails System Act, CDCA Plan, WEMO Plan, and relevant BLM and NPS policies. Additional discussion related to special designation areas may be found in Sections 3.3, *Biological Resources-Vegetation*; 3.4 *Biological Resources-Wildlife;* 3.6, *Cultural Resources*; 3.13, *Recreation*, and 3.18, *Visual Resources.*

3.15.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address potential impacts to special designations.

3.15.6 Direct and Indirect Effects

3.15.6.1 Alternative A: Proposed Action

The Proposed Action would have no direct impact on any special designation, since the Project site does not overlap with any of the identified designations, and no new designations or amendments to existing designations are proposed for the site. However, due to the proximity of the Proposed Action to several of the special designations described above, indirect impacts could occur.

As discussed in Section 3.11, *Noise*, the loudest noise associated with the Project (during the construction phase) would attenuate such that the sound would be barely audible to users of the Mojave National Preserve or other special designations further from the Project site, such as the closest portion of the Old Spanish National Historic Trail, which is approximately 2 miles from the Project site (BLM, 2006). Additionally, as discussed in Section 3.2, *Air Resources*, all phases of the Proposed Action could generate fugitive dust, but these emissions would occur within the Project fence line and drop off quickly with distance, resulting in no effect on special designations.

The Proposed Action would not directly affect the natural condition of special designations in the general Project vicinity, as discussed in Sections 3.3, *Biological Resources – Vegetation*, and 3.4, *Biological Resources – Wildlife*. With respect to indirect effects to vegetation and wildlife, there is no indication that the Proposed Action would result in the introduction of invasive species within off-site special designations. Additionally, the Proposed Action would be located downstream of nearby special designations, therefore no Project-related changes in hydrology are expected to occur within these lands. Although the Proposed Action would create a movement barrier for large wildlife across the site due to the exclusion fencing, the Project would have no effect on wildlife habitat connectivity within off-site special designations.

Additionally, as described in Section 3.18, *Visual Resources*, the Project site would be visible from select locations within Mojave National Preserve, and the Project could introduce visual contrast into the landscape visible from these locations. Views of the Project site from designated wilderness within the preserve would be negligible due to the distance of the wilderness from the Project area, the viewing angle, and typical atmospheric conditions. As shown on Figure 3.18-5 in Section 3.18, Key Observation Points (KOPs) 6 and 7 are within the Soda Mountains WSA. The Project site would be visible from these points, and Project features would result in moderate to strong visual contrast in the landscape visible from these points. Mitigation Measures 3.18-1 through 3.18-4 would reduce the degree of contrast by requiring the use of approved paint colors and shielded and minimized night lighting. The Project site would not be visible from the Cady Mountains or any other WSA. The nearest portion of the Old Spanish National Historic Trail is shown in relation to the Project site on Figure 3.18-5. Due to its distance from the trail and intervening topography, the Project site would not be visible from this trail, and would therefore have no impact on visual resources within the viewshed of the trail.

3.15.6.2 Alternative B

Because it would be located primarily within the same footprint analyzed for the Proposed Action, and because the Alternative B Rasor Road alignment also would not be located within any special designations, for the reasons described above, Alternative B would have no direct impact and limited potential for indirect impacts on any of the special designations during construction, operation and maintenance, and decommissioning.

3.15.6.3 Alternative C

Because it would be located within the same footprint analyzed for the Proposed Action, for the reasons described above, Alternative C would have no direct impact and limited potential for indirect impacts on any of the special designations during construction, operation and maintenance, and decommissioning.

3.15.6.4 Alternative D

Because it would be located within the same footprint analyzed for the Proposed Action, for the reasons described above, Alternative D would have no direct impact and limited potential for indirect impacts on any of the special designations during construction, operation and maintenance, and decommissioning.

3.15.6.5 Alternative E: No Action/No Project

Under the No Action/No Project Alternative, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the groundwater well permit application. Because the Project would not be approved, no new structures or facilities would be constructed, operated and maintained, or decommissioned on the site, and no related ground disturbance or other Project-related activities and associated impacts would occur. The BLM would continue to manage the lands under its land use jurisdiction consistent with the site's multiple use classifications as described in the CDCA Plan. There would be no impact on special designations adjacent to or within the vicinity of the Project site as a result of the No Action/No Project Alternative.

3.15.6.6 Alternative F: CEQA No Project

Direct and indirect impacts to special designations would be the same as described above for the Proposed Action and other action alternatives. Importing water to the site by truck as would be required by this alternative would not directly or indirectly affect special designations because the trucks would travel only on established paved roads such as I-15 outside of the Project boundary.

3.15.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project but would amend the CDCA Plan to identify the site as unsuitable for solar development, and the County would not approve the groundwater well permit application. Because the Project would not be

approved, no new structures or facilities would be constructed, operated and maintained, or decommissioned on the site, and no related ground disturbance or other Project-related activities and associated impacts would occur. The BLM would continue to manage the lands under its land use jurisdiction consistent with the site's multiple use classifications as described in the CDCA Plan. There would be no impact on special designations adjacent to or within the vicinity of the Project site as a result of this alternative.

3.15.7 Cumulative Effects

As described above, the Project would result in no direct or indirect impacts to on-site special designations (because there are none), and no direct or indirect impacts to off-site special designations with respect to air quality, wildlife resources, or noise. Therefore the Proposed Action and alternatives would not contribute to cumulative effects on these areas.

The Project could result in indirect effects to off-site special designations as a result of its limited potential to contribute to the spread of invasive vegetation and its potential to affect visual resources. The cumulative effects of projects in the cumulative scenario on vegetation are described in Section 3.3, *Biological Resources – Vegetation*. Cumulative effects on visual resources within Mojave National Preserve are described in Section 3.18, *Visual Resources*.

3.15.8 Mitigation Measures

No mitigation measures are required.

3.15.9 Residual Effects

Because no mitigation measures are required, the residual effects on special designations would be the same as those described in Sections 3.15.6 and 3.15.7.

3.15.10 CEQA Significance Thresholds and Determinations

Special designations are uniquely federal concerns. No CEQA significance thresholds apply.

References

Bureau of Land Management (BLM), 1979a. California Statewide Wilderness Inventory Map, Southern Half. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/wilderness.Par.4338.File.dat/CDCA_WildInvS_1979_508c.pdf]

BLM, 1979b. California Desert Conservation Area – Wilderness Inventory – Final Descriptive Narratives, March 31, 1979. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/wilderness/wi.Par.92238.File.dat/CDCAWildernessInvNarr_Final_March1979.pdf]

BLM, 1980. The California Desert Conservation Area Plan, as amended. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/cdcaplan.Par.15259.File.dat/CA_ Desert_.pdf]

BLM, 1990, California Statewide Wilderness Study Report(s); Soda Mountains (CDCA-242) and Cady Mountains (CDCA-251).

BLM, 1999. California Desert Conservation Area Plan of 1980, as amended. [http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.aa6ec747.File.pdf/CA_Desert_.pdf]

BLM, 2001. The Federal Land Policy and Management Act of 1976 (as amended). Index # BLM/WO/GI-01-002. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications_Directorate/legislation.Par.3647.File.dat/FLPMA.pdf]

BLM, 2005. BLM Manual; Land Use Planning Handbook H-1601, Appendix C, pp. 27-29.Rel. 11693. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.38665.File.dat/h1601-1.pdf]

BLM, 2006. Old Spanish National Historic Trail. [http://www.oldspanishtrail.org/assets/downloads/Barstow.pdf]

BLM, 2010. Bureau of Land Management Wilderness Study Area List. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Law_Enforcement/nlcs/online_electronic.Par.20654.File.dat/WSA_Detailed%20Table_Updated_December2010.pdf]

BLM, 2012a. BLM Manual 6330. Management of Wilderness Study Areas (Public), Release 6-134 (July 13). [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.31915.File.dat/6330.pdf]

BLM, 2012b. BLM Manual 6310, Conducting Wilderness Characteristics Inventory of BLM Lands (March 15). [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.38337.File.dat/6310.pdf]

BLM, 2012c. BLM Manual 6320. Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process (Public), Release 6-130. 03/15/2012 (March 15). [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.52465.File.dat/6320.pdf]

BLM, 2012d. BLM Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.1039.File.dat/M6280%20NSHT%20Management_Final_091212%20(2).pdf]

BLM, 2013. National Conservation Lands [www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS.print.html] Accessed May 23, 2013.

National Park Service (NPS), 2002. Mojave National Preserve General Management Plan, Introduction. [http://www.nps.gov/moja/parkmgmt/gmp.htm] Accessed June 24, 2013.

NPS, 2009. The National Trails System Act, as amended through March 30, 2009. [http://www.nps.gov/nts/legislation.html] accessed June 24, 2013.

NPS, 2012. Mojave Wilderness. [http://home.nps.gov/moja/planyourvisit/wilderness-mojave.htm] Accessed June 24, 2013.

NPS, 2013. Designations of National Park System Units. [http://www.nps.gov/goga/planyourvisit/designations.htm] Accessed January 3, 2013.

NPS and BLM, 2012. NPS/BLM-Brochure: Old Spanish Trail Office Map and Guide; Bureau of Land Management, NPS/BLM National Park Service, U.S. Department of Interior NPS/BLM 04/12

This page intentionally left blank

3.16 Transportation and Travel Management

3.16.1 Introduction

This section describes existing conditions related to transportation and traffic, including applicable plans, policies, and regulations. Because the Project site is located in a remote area, all materials would have to be brought to the site from long distances, and personnel would have to travel from surrounding communities within San Bernardino County, such as Barstow, as well as cities in Nevada, such as Las Vegas. Consequently, all Project-related traffic would utilize I-15 for regional travel, Rasor Road and Arrowhead Trail for access to the Project's South and East Arrays, and Blue Bell Mine Road for access to the Project's North Array. Therefore, the study area for this analysis of transportation and traffic includes these local roads and I-15 in the vicinity of the Project site.

3.16.2 Regional and Local Environmental Setting

3.16.2.1 Regional and Local Roadway Facilities

In the Project area, I-15 is classified as a freeway with two lanes in each direction. Access to the site from I-15 is through the interchanges with Rasor Road and Zzyzx Road. Local access to the Project site is from Rasor Road, Arrowhead Trail, and Blue Bell Mine Road.

3.16.2.2 Existing Traffic Volumes and Levels of Service

The level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS indicators for the highway and roadway system are based on specific characteristics of traffic flow on designated sections of roadway during a typical day. For mainline freeway and roadway segments, these include overall traffic volume, speed, and density.

Several physical and operational characteristics of the roadway, such as lane configuration and flow speed (i.e., the typical speed along a roadway segment) are used to determine the vehicular capacity of the roadway segment. When these two sets of data are compared, a volume-to-capacity ratio is calculated. These factors then are converted to a letter grade identifying operating conditions and expressed as LOS A through F. The 2000 *Highway Capacity Manual,* published by the Transportation Research Board, includes six levels of service for roadways or intersections ranging from LOS A (best operating conditions characterized by free-flow traffic, low volumes, and little or no restrictions on maneuverability) to LOS F (worst operating conditions characterized by forced traffic flow with high traffic densities, slow travel speeds, and often stop-and-go conditions) (Transportation Research Board, 2000).[1]

[1] This manual is a common guide used for computing the capacity and quality of service of various highway facilities, including freeways, arterial roads, signalized and unsignalized intersections and the effects of mass transit, pedestrians, and bicycles on the performance of these systems.

Table 3.16-1 provides existing peak-hour traffic volumes and LOS for I-15 that would be used for indirect access to the Project site. As indicated below, traffic conditions along I-15 in the Project area are operating at LOS A during the peak traffic hours.

TABLE 3.16-1
EXISTING PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

	Existing Conditions			
Roadway/Segment	**Travel Lanes**	**Volume[a]**	**Capacity[b]**	**LOS**
I-15, south of Rasor Road	4	2,280	8,000	A
I-15, between Rasor Road and Zzyzx Road	4	2,280	8,000	A
I-15, north of Zzyzx Road	4	2,280	8,000	A

NOTES:
[a] Derived from Caltrans traffic counts in Project area, September 2012.
[b] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).

SOURCE: Caltrans, 2012b

3.16.2.3 Project Access

Regional Access

Interstate 15 (I-15) is a four-lane freeway that runs in a southwest-northeast alignment. I-15 provides access to multiple communities throughout San Bernardino County, including Barstow as well as communities in Los Angeles County and to points farther southwest, and communities in Nevada and to points farther northeast. The most recent data published by Caltrans indicates the Average Daily Traffic (ADT) on the roadway in the Project area is about 28,000 vehicles (Caltrans, 2012a). The roadway is included in the San Bernardino Association of Governments (SANBAG) Congestion Management Program (CMP) Roadway Network (SANBAG, 2009).

Local Access

Local access to the proposed array areas on the Project site is provided by local roadways (Rasor Road, Arrowhead Trail, and Blue Bell Mine Road), which are low-volume roads that serve low-intensity uses such as air strips and desert areas. These roads are a mix of unpaved and paved, and allow for two lanes of traffic.

Site Access

Access to the proposed array areas would be from Rasor Road and Arrowhead Trail (South and East Arrays), and Blue Bell Mine Road (North Array). Internal access to the arrays currently is undeveloped and unpaved.

3.16.2.4 Public Transportation within the Vicinity of the Project

Baker Airport

The nearest airport facility to the Project site is the Baker Airport. Baker Airport is a public general aviation facility, located approximately 2 miles north of Baker and 8 miles northeast of the Project site on BLM-managed land and operated under a lease to San Bernardino County (FAA, 2013). The airfield has been open since 1963.

Baker Airport has one operating runway, Runway 15/33, which is 3,157 feet long and 50 feet wide. The runway has an asphalt surface, generally in poor condition. Current operations at Baker Airport are limited. For the 12-month period ending in May 2012, aircraft operations averaged 42 takeoffs or landings per month or about 500 operations per year (Airnav, 2013).

Airstrips

An unofficial private airstrip previously was located at the Desert Studies Center on the west side of Soda Lake, about 4 miles east of the Project site (Fulton, 2013). This airstrip reportedly was used in the 1950's for the former mineral springs resort. However, the airstrip was never official and was abandoned when the Desert Studies Center took over the facility in 1976. There also is an historical private airstrip located adjacent to the Rasor Road service station (near the junction of Rasor Road and I-15, southwest of the Project site) (Panorama Environmental, Inc., 2013a).

3.16.3 Applicable Laws, Regulations, Plans, and Standards

Construction, operation, maintenance, and decommissioning of the Project would affect access and traffic flow patterns on public streets and highways. Therefore, it would be necessary for the Applicant and/or the construction contractor(s) to obtain encroachment permits or similar legal agreements from the public agencies responsible for the affected roadways and other applicable ROWs. Such permits are needed for ROWs that would be affected by access road construction. For the Project, encroachment permits would be issued by Caltrans and San Bernardino County, and could be required from other affected agencies and companies.

3.16.3.1 Federal

Code of Federal Regulations

Title 49 of the Code of Federal Regulations Subtitle B, Parts 171-173, 177-178, 350-359, 397.9 and Appendices A through G address safety considerations for the transport of goods, materials, and substances and governs the transportation of hazardous materials, including types of materials and marking of the transportation vehicles.

CDCA Plan

On lands designated Multiple Use Class L (Limited), new roads and ways may be developed under ROW grants or pursuant to regulations or approved plans of operation. On Class M (Moderate) and I (Intensive) lands, new routes may be allowed upon approval of the authorized officer. In all areas of the Project site, motorized vehicle use is allowed on existing routes of

travel, except on routes designated closed or limited by the authorized officer. In Class I areas, vehicle open areas are available for unrestricted vehicle access.

3.16.3.2 State

The use of state highways for other than transportation purposes requires an encroachment permit, which an applicant can obtain through submission of Caltrans Form TR-0100. This permit is required for utilities, developers, and non-profit organizations for use of the state highway system to conduct activities other than transportation (e.g., landscape work, utility installation, film production) within the ROW. The application would be forwarded to Caltrans District 8, whose jurisdiction includes the Project site. Part 6 of the California Manual on Uniform Traffic Control Devices provides Temporary Traffic Control (Caltrans, 2012c). Additionally, the transport of oversize or overweight loads would require approval from Caltrans.

Congestion Management Program

The California CMP was created in 1990 by voter-approved Proposition 111. San Bernardino Associated Governments (SANBAG) is the council of governments and transportation planning agency for San Bernardino County. SANBAG serves as the Congestion Management Agency (CMA) of San Bernardino County (SANBAG, 2007). As the County's CMA, SANBAG is responsible for managing the County's blueprint to reduce congestion and improve air quality. SANBAG is authorized to set state and federal funding priorities for transportation improvements affecting the San Bernardino County CMP transportation system. Roadways in proximity to the Project site that are designated in the CMP roadway system include I-15.

The CMP specifies a system of highways and roadways for which traffic level of service standards are established. The CMP system includes all freeways, state highways, and principal arterials in the County. The program sets level of service standards for all CMP roadway segments and intersections. The LOS standard for all CMP roadways is LOS E; therefore the above-mentioned CMP roadways near the Project site have a level of service standard of LOS E. SANBAG requires local jurisdictions to analyze impacts of new developments or land use policy changes on CMP facilities. SANBAG periodically monitors the CMP Roadway System and records levels of service along CMP facilities (SANBAG, 2009). Intersection and roadway level of service assessments of CMP facilities are conducted periodically and vary by year; the assessment of its facilities was completed in 2009, but a 2012 monitoring report is forthcoming (SANBAG, 2013).

3.16.4 Analytical Methodology

This analysis focuses on potential impacts of the construction, operation, maintenance, and decommissioning of the Proposed Action and alternatives on the surrounding transportation systems and roadways. Impacts to local transportation systems are evaluated based on LOS determinations, which is a generally accepted measure used by traffic engineers, planners, and decision-makers to describe and quantify the congestion level on a particular roadway or intersection based on specific characteristics of traffic flow on designated sections of roadway during a typical day. For mainline freeway and roadway segments, these characteristics include overall roadway capacity and traffic volume, speed, and density.

This analysis relies on the methodology contained in the *Highway Capacity Manual* to determine potential impacts to roadways from construction and operation of the Proposed Action and alternatives. Several physical and operational characteristics of the roadway, such as lane configuration and flow speed (typical speed along a roadway segment) are used to determine the vehicular capacity of the roadway segment. When these two sets of data are compared, a volume-to-capacity (v/c) ratio is calculated. The v/c ratio then is assigned a corresponding letter grade to represent the overall condition of the roadway or level of service. As described above, these grades range from LOS A to LOS F.

The assessment of transportation-related impacts is based on evaluations and technical analyses designed to compare the pre-Project (baseline) conditions to conditions resulting from Project implementation.

3.16.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects related to transportation and travel management.

> **APM 29:** The Applicant shall implement a departing vehicle plan for those hours on Fridays and Sundays. The plan shall specify that work crew departures will be staggered on Friday and Sunday afternoons to avoid impacts to I-15 mainline traffic LOS.
>
> **APM 30:** The Applicant shall document road conditions on Rasor Road, Blue Bell Mine Road, and any other local construction access roads prior to and the end of project construction and decommissioning, and restore the roads to pre-construction (and pre-decommissioning) conditions if construction damage is documented. The Applicant shall present a plan for restoration to the BLM and San Bernardino County within 60 days of completing construction and decommissioning. The restoration shall occur within 180 days of the BLM and San Bernardino County approval of the plan.
>
> **APM 31:** Emergency access to the site shall be maintained at all times.
>
> **APM 32:** The relocated segment of Rasor Road shall be completed and open to traffic prior to the permanent closure of decommissioning of the pre-Project location of Rasor Road.

3.16.6 Direct and Indirect Effects

3.16.6.1 Alternative A: Proposed Action

Construction

Project construction is anticipated to occur between 24 and 30 consecutive months, beginning in summer 2014. Construction of the Project would occur over sequential stages, as construction of solar array blocks to generate up to 100 MW would occur in Year 1; construction of additional solar array blocks to generate up to 125 MW in Year 2; and construction of additional solar array blocks to generate up to 125 MW in Year 3. The estimated completion date for the Project is Year 2017. Construction generally would occur between 6:00 a.m. and 6:00 p.m., Monday

through Saturday; however, construction activities on Sundays may be necessary to make up schedule deficiencies or to complete critical construction activities.

The installation of collection lines between the planned array areas would be constructed under I-15, and no temporary or permanent closure of any travel lanes along the freeway would be required. The Applicant would coordinate with Caltrans and would secure the necessary encroachment permit for activities within Caltrans right-of-way (i.e., I-15). No overhead collector lines are proposed.

The construction laydown area is planned to occupy approximately 30 total acres within the ROW. The laydown area would include parking for construction worker vehicles, truck loading and unloading facilities, and an area for staging and assembling Project components. Temporary storage for staging of a one-month supply of concrete raw materials would be constructed.

Construction activities primarily would occur on-site, within the requested ROW boundary. To access the interior of the Project site, new roadways would be constructed to transport equipment and materials from the staging areas to the construction areas and then to access the solar arrays. All new temporary and permanent roadways would be graded and consist of compacted native materials to meet load requirements for vehicle traffic over the life of the Project. Approximately 14.5 miles of 16-foot-wide access roads and 10-foot-wide maintenance roads are planned for the Project. In addition, the construction of the Project would require the relocation of Rasor Road. The realignment would result in approximately 2.6 miles of newly constructed roadway, and the new road would be approximately 26 feet in total width. The Project would not permanently remove or restrict the roadway to users over a long-term period, and once the realigned Rasor Road is complete, the roadway would be available for all users (Project-related vehicles and the general public).

Construction Traffic

Table 3.16-2 presents the average and maximum daily construction vehicles (worker and trucks) generated by the Project during construction. As shown, the Project would generate between 335 and 410 daily vehicle trips.

TABLE 3.16-2
ESTIMATED DAILY VEHICLE TRIPS FOR PROJECT CONSTRUCTION

Trip Type	Average Daily Round trips	Maximum Daily Round trips
Heavy-duty trucks (off-site material transportation)	120	120
Worker Vehicles	215	290
Total Construction Traffic	***335***	***410***

Worker Vehicle Trips. As stated in Section 2.4.3.9, *Work Force, Schedule, and Equipment*, the average construction workforce is expected to be 175 workers, with the peak workforce of up to 250 workers. In addition, there would be up to 40 additional non-direct labor workers on site. To ensure that vehicle trip generation is not underestimated for the analysis of potential impacts, it is

assumed that all workers would travel to and from the Project site in their own vehicles on a daily basis. Therefore, it is expected that the Project would generate an average of 215 round trips per day and a maximum of 290 round trips per day from worker vehicles (which equates to 580 one-way trips).

Haul /Water Truck Trips. The Project would require an average of 120 deliveries per day from trucks hauling materials (Panorama Environmental, Inc., 2013b). Therefore, the Project would generate an average of up to 120 round trip haul truck trips per day (240 one-way trips), 25 days per month.

Vehicle Trip Distribution. Based on the origin-location of construction workers commuting to and from the Project site, approximately 50 percent of construction workforce traffic (145 of the peak daily direct and non-direct workforce) would originate north of the Project site (Baker and points further north), and would travel south on I-15 to access the Project site, and the other approximately 50 percent would originate south of the Project site (Barstow and points further south), and would travel north on I-15 to access the Project site.

Access to the portion of the Project site located south and east of I-15 would be provided via Rasor Road, and access to the portion of the Project site located north and west of I-15 would be provided via the Zzyzx Road exit and Blue Bell Mine Road.

Construction Impacts

As stated above, a maximum of 290 daily round trips (580 one-way trips) would be generated by workers commuting during Project construction. Although the construction work hours would be 6:00 a.m. to 6:00 p.m., meaning construction workers would commute to and from the Project site outside of the typical peak commute periods (7:00 to 9:00 a.m., and 4:00 to 6:00 p.m.), the analysis conservatively assumes all construction workers would commute during the aforementioned peak traffic periods. It is expected that the maximum number of Project-generated truck trips (delivering materials and equipment) would be 120 round trips (240 one-way trips) per day. Haul trucks would use dedicated truck routes within each jurisdiction, and would comply with all Caltrans permitting requirements when any truck loads are oversize. As described in Section 3.16.3.2, *Applicable Laws, Regulations, Plans, and Standards*, Caltrans has the discretionary authority to issue special permits for the movement of vehicles and/or loads exceeding statutory limitations on the size, weight, and loading of vehicles contained in the California Vehicle Code. The California Highway Patrol is notified about transportation of oversize and/or overweight loads.

Assessment of the short-term effect that Project construction traffic could have on local and regional roads includes review of existing traffic volumes and consideration of both the increase that Project-generated construction traffic would contribute to existing traffic levels of service and the capacity of the road to handle the additional traffic. Although construction-related traffic would fluctuate throughout the entire construction period, due to scheduling of tasks and shifting workforce per Project component, the analysis focuses on the maximum Project-generated increase in traffic on the surrounding transportation network (approximately 410 daily round trips). Traffic conditions were examined under Year 2014 conditions in order to evaluate the

extent to which the peak number of workforce traffic would affect the surrounding transportation network.[2] In order to determine Year 2014 traffic conditions along I-15, projected traffic conditions were derived based on traffic volumes collected by Caltrans between 2002 and 2010 on I-15. An average annual growth rate of 1.4 percent per year was applied to the existing 2012 peak-hour traffic volumes.

As shown in Table 3.16-3, the increase in traffic associated with the construction activities at the Project site would not change the LOS during the Year 2014 peak traffic periods along I-15, and these freeway segments would continue to operate at an acceptable LOS.

TABLE 3.16-3
YEAR 2014 AND YEAR 2014 PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

Roadway/Segment	Travel Lanes	Capacity[a]	Year 2014 Conditions[b]		Year 2014 plus Project Conditions[c,d]	
			Volume	LOS	Volume	LOS
I-15, south of Rasor Road	4	8,000	2,345	A	2,550	A
I-15, between Rasor Road and Zzyzx Road	4	8,000	2,345	A	2,755	A
I-15, north of Zzyzx Road	4	8,000	2,345	A	2,550	A

NOTES:
[a] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).
[b] Year 2014 traffic volumes without the added construction-related Project traffic.
[c] Year 2014 traffic volumes with the added construction-related Project traffic.
[d] Analysis assumes 50 percent construction workers/trucks would originate north/east of the site and 50 percent would originate south/west of the site.

SOURCE: Caltrans, 2012b

Although construction traffic would be more noticeable on local roads (e.g., Zzyzx Road, Rasor Road, Blue Bell Mine Road, and Arrowhead Trail Highway) than on I-15, the increased traffic volumes would remain at levels less than the carrying capacity of those two-lane roads. Because increases in traffic associated with the Project construction activities would not be substantial relative to Year 2014 conditions, the Project would not affect traffic conditions over the course of a workday.

Furthermore, as discussed above, I-15 has sufficient capacity to accommodate Project construction-related traffic while maintaining acceptable LOS during the peak-hour periods. However, during these peak periods, the arrival of approximately 290 construction workers during a single hour could cause delays for workers at the stop-sign-controlled I-15 ramp/Zzyzx Road intersection and I-15 ramp/Rasor Road intersection, which could cause vehicles to queue back down the off-ramps onto the right lane of I-15. Because I-15 is a relatively low-volume interstate freeway that operates

[2] Per the Air Quality and Greenhouse Gas Impact Analysis prepared for the Project (Pan Environmental, Inc., 2013; Appendix D), the earliest possible peak construction time was assumed to be in August 2014. Therefore, to be consistent with the Air Quality and Greenhouse Gas Emissions analyses presented in this PA/EIS/EIR and to avoid underestimating the extent to which construction-related traffic would affect the surrounding roadway network, the traffic analysis assumes that peak construction would occur in Year 2014.

at acceptable service levels (LOS A) and has two lanes in each direction, there would be adequate capacity in the I-15 left lane to allow vehicles to safely pass by any such potential back-up. Although construction worker traffic would travel to and from the Project site outside typical commute peak hours, the Project Applicant would stagger worker departure times during peak commute days (e.g., Fridays and Sundays) to reduce any conflicts with peak period traffic (see APM 29 in Section 3.16.5, above),[3] therefore, construction activities associated with the Project would not result in any potential adverse queuing effects on the I-15 off-ramps.

Construction of most of the planned facilities would not require closure of any travel lanes and therefore would not reduce the roadway capacity on roads that provide access to the work sites; however, the Project would require the realignment of Rasor Road to allow for enhanced access to the Operation and Maintenance building and South Array areas. Accordingly, the affected portion of Rasor Road would be temporarily disrupted and/or closed during the realignment, but the Project would not permanently remove or restrict the roadway to users over a long-term period. In addition, the installation of collection lines between the planned array areas would be constructed under I-15, and no temporary or permanent closure of any travel lanes along the freeway would be required.

As stated, there is no transit service at or near the Project site, nor are there any bicycle or pedestrian facilities adjacent to or within the Project site. Furthermore, no such facilities or operations are currently planned to occur at or within the Project site. Therefore, with respect to construction effects on existing bus transit services, the traffic increases that would primarily occur on I-15 between Rasor Road and Zzyzx Road during construction would not result in any disruption to transit service, nor would construction activities affect bicycle and pedestrian facilities.

Operation and Maintenance

The Project would generate minimal traffic during the operation and maintenance period. Operation and maintenance activities would require up to 40 permanent, full-time personnel. It is expected that some personnel may be required to be present on-site 7 days a week in order to provide additional monitoring and support on an as-needed basis. During seasonal periods when panel washing would be required, temporary personnel would also be employed. Panel washing for the solar array areas would occur up to two times per year. It is anticipated that washing for each array area (North, East, and South) would require approximately 30 days to complete, or approximately 120 days per year in order to complete panel washing of the entire Project facility. In addition, the Project would not require any truck deliveries or transport of water to the site during operation and maintenance activities. Potable water and water for panel cleaning would be provided on-site.

Operational personnel are anticipated to originate from the Baker and Barstow areas (to points east and west of the Project site) or areas within a relative proximity to the Project site, taking into consideration travel length and travel time for a typical permanent employee traveling to and from the Project site.

[3] As described under APM 29 in Section 3.16.5, periods of high traffic volume on I-15 typically occur on Fridays (10:00 a.m. to 6:00 p.m.) and Sundays (11:00 a.m. to 8:00 p.m.), as high traffic volumes are attributed to the substantial number of vehicles traveling to and from Las Vegas, Nevada.

Operation and Maintenance Impacts

Full-time staff would generate up to 40 round trips (80 one-way trips) per day. Permanent staff could be expected to arrive and depart the Project during typical peak commute periods.

Complete commercial operation of the Project and its components is anticipated to occur by 2017. Therefore, traffic conditions were examined under Year 2017 conditions in order to evaluate the extent to which peak operational traffic would affect the surrounding transportation network. Consistent with the assessment of Year 2014 conditions, described above, the same average annual growth rate was applied to existing volumes along I-15 in order to derive Year 2017 traffic volumes.

As shown in Table 3.16-4, the increase in traffic associated with the operation and maintenance activities at the Project site would not change the LOS during the Year 2017 peak traffic periods along I-15, and these freeway segments would continue to operate at an acceptable level of service.

TABLE 3.16-4
YEAR 2017 AND YEAR 2017 PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

Roadway/Segment	Travel Lanes	Capacity[a]	Year 2017 Conditions[b]		Year 2017 plus Project Conditions[c,d]	
			Volume	LOS	Volume	LOS
I-15, south of Rasor Road	4	8,000	2,450	A	2,470	A
I-15, between Rasor Road and Zzyzx Road	4	8,000	2,450	A	2,490	A
I-15, north of Zzyzx Road	4	8,000	2,450	A	2,470	A

NOTES:
[a] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).
[b] Year 2017 traffic volumes without the added operation-related Project traffic.
[c] Year 2017 traffic volumes with the added operation-related Project traffic.
[d] Analysis assumes 50 percent of full-time personnel would originate north/east of the site and 50 percent would originate south/west of the site.

SOURCE: Caltrans, 2012b

The increased traffic volumes along I-15 would remain at levels less than the carrying capacity and would not deteriorate peak-hour LOS conditions along the freeway. Furthermore, the minimal amount of traffic generated by the Project during operation and maintenance activities would not result in any adverse effects along the I-15 off-ramps during the morning and afternoon peak commute period.

Because increases in traffic associated with the Project operation and maintenance activities would not be substantial relative to Year 2017 conditions, the Project would not adversely affect traffic conditions over the course of a workday. In addition, operation and maintenance activities associated with the Project would not result in the temporary or permanent closure of roads or travel lanes; therefore, there would be no reduction in roadway capacities during this period of

activity. Lastly, the minimal amount of traffic generated by the Project would not adversely affect any transit, bicycle, and pedestrian facilities in proximity to the site.

Decommissioning

As stated in Section 2.4.5, *Decommissioning and Site Reclamation*, the Project is anticipated to be operational during a 30-year period; if no permit is extended beyond the 30-year period, the Project would cease operation. All Project components would be decommissioned, and the site would be restored to pre-Project conditions. Although the number of workers and trucks required during decommissioning of the Project is not known at this point in time, it is likely that such activities would be similar to construction activities described above. Therefore, the analysis assumes that decommissioning would require up to 290 workers and up to 120 trucks per day, generating up to 580 daily one-way worker trips and up to 240 daily one-way truck trips, spread throughout the course of the day.

Because traffic conditions are likely to change over the life of the Project, the conditions on I-15 at the time of closure and decommissioning are unknown and estimating these conditions would be speculative.

Decommissioning Impacts

Because the number of workers and trucks required during decommissioning activities of the Project and its components would likely be similar to that during the peak construction period in 2014 (described above), the increased traffic during decommissioning would have the same contribution to traffic conditions as during peak construction. The LOS of traffic flow along I-15 in the Project area could be temporarily degraded if traffic conditions were to worsen substantially during the Project's operating lifetime, but likely would not be degraded below the acceptable LOS E, and temporary decommissioning effects would not result in permanent LOS degradation. Therefore, I-15 is expected to operate at acceptable conditions during decommissioning. Furthermore, the increase in vehicle trips by the workforce during decommissioning activities is not expected result in any adverse effects along the I-15 off-ramps during the morning and afternoon peak commute periods.

Similar to construction activities of the Project, as described above, decommissioning of most of the Project facilities would not require closure of any travel lanes and therefore would not reduce the roadway capacity on roads that provide access to the work sites. In addition, the short-term traffic increases during Project decommissioning activities, which would occur primarily on I-15 and other local roadways (Zzyzx Road, Rasor Road, and Blue Bell Mine Road), would not adversely affect any transit service or bicycle and pedestrian facilities, or users of such facilities.

3.16.6.2 Alternative B

Alternative B would consist only of the East and South arrays as described for the Proposed Action; the North Array and one groundwater well would not be constructed. Primary site access would be via the alternative realignment of Rasor Road (as shown in Figure 2-8 in Chapter 2). Access to the substation would be provided in the same manner as for the Proposed Action (i.e., via Blue Bell Mine Road).

The Alternative B construction workforce would be smaller than proposed under the Proposed Action, due to the reduced size of the facility, and construction would occur within a shorter timeframe, i.e., an 18- to 22-month period rather than the 24- to 30-month period for the Proposed Action. The construction, operation and maintenance, and decommissioning of Alternative B would not result in any adverse traffic impacts with respect to levels of service along I-15.

3.16.6.3 Alternative C

Alternative C would consist only of the North and South arrays as described for the Proposed Action; the East Array and one groundwater well would not be constructed. Primary site access would be via the Applicant-proposed realignment of Rasor Road (as shown in Figure 2-9 in Chapter 2). Access to the substation would be provided in the same manner as for the Proposed Action (i.e., Blue Bell Mine Road).

The Alternative C construction workforce would be smaller than proposed under the Proposed Action, due to the reduced size of the facility, and construction would occur within a shorter timeframe, i.e., a 20- to 25-month period (as opposed to 24- to 30-month period for the Proposed Action). The construction, operation and maintenance, and decommissioning of Alternative C would not result in any adverse traffic impacts with respect to levels of service along I-15.

3.16.6.4 Alternative D

Alternative D would be similar to the Proposed Action; however, the East and South arrays would be reduced in size, and the North Array, substation, and switchyard would be built as proposed under the Proposed Action. However, unlike the Proposed Action, Alternative D would not realign Rasor Road, and no changes to the roadway would be required in order access the southeast portion of I-15.

The Alternative D construction workforce would be smaller than proposed under the Proposed Action due to the reduced size of the facility, and construction would occur within a shorter timeframe, i.e., a 17- to 21-month period (as opposed to 24- to 30-month period for the Proposed Action). The construction, operation and maintenance, and decommissioning of Alternative D would not result in any adverse traffic impacts with respect to levels of service along I-15.

3.16.6.5 Alternative E: No Action/No Project

If Alternative E were implemented, no Project-related changes would occur, and the existing environmental setting described in Section 3.16.2 would be maintained. As a no-development alternative, Alternative E would result in no changes to existing transportation and traffic conditions; therefore, no impact would occur.

3.16.6.6 Alternative F: CEQA No Project

Under Alternative F, a PV solar energy facility and related infrastructure could be developed on the Project site, but would require a non-groundwater source of water for potable use, dust control, panel washing, and fire protection. Any of the action alternatives previously described

(Proposed Action, Alternatives B, C, or D) could be approved by the BLM and developed by the Applicant. Impacts associated with those alternatives are described and analyzed above. This analysis of Alternative F focuses on the incremental additional impacts associated with transporting necessary water to the Project site.

Construction and Decommissioning

Alternative F would generate up to 30 truck trips (60 one-way trips) per day to deliver water to the site during construction, with water deliveries originating in Baker (Pan Environmental, Inc., 2013). Table 3.16-5 demonstrates the difference in daily traffic to the site based on these 30 round trips per day. Even with these trips considered, I-15 in the Project Area would remain at LOS A because, for this planning-level of analysis, any volume less than 4,841 (v/c ratio 0.60 or lower) is LOS A.

TABLE 3.16-5
YEAR 2014 AND YEAR 2014 PLUS ALTERNATIVE F PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

Roadway/Segment	Travel Lanes	Capacity[a]	Year 2014 Conditions[b]		Year 2014 plus Project Conditions[c,d]	
			Volume	LOS	Volume	LOS
I-15, south of Rasor Road	4	8,000	2,345	A	2,550	A
I-15, between Rasor Road and Zzyzx Road	4	8,000	2,345	A	2,785	A
I-15, north of Zzyzx Road	4	8,000	2,345	A	2,580	A

NOTES:
[a] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).
[b] Year 2014 traffic volumes without the added construction-related Project traffic.
[c] Year 2014 traffic volumes with the added construction-related Project traffic.
[d] Analysis assumes 50 percent construction workers/trucks would originate north/east of the site and 50 percent would originate south/west of the site, while 100 percent of water truck trips would originate north/east of the site.

SOURCE: Caltrans, 2012b

During decommissioning, workforce and truck traffic (for materials, equipment, and water needs) would be similar to the traffic generated under the Proposed Action, or such traffic demand would be reduced under Alternatives B, C, and D, respectively.

Operation and Maintenance

During operation and maintenance, Alternative F would require an average of six truck trips per day to deliver water for dust suppression, up to one truck trip every three to four days to deliver potable water, and up to four truck trips per day during periodic panel washing activities, for a maximum of 11 truck trips per day (22 one-way trips). This would be in addition to the operation and maintenance period traffic generated by the Proposed Action, which would not require any water truck trips to the site during operation and maintenance activities.

It is assumed that Alternative F would generate a similar number of daily worker and truck trips to the Proposed Action and Alternatives B, C, and D. Because the Proposed Action and all Alternatives and associated traffic during operation and maintenance activities would not result in any adverse traffic impacts with respect to levels of service along I-15 (see Table 3.16-4), and because Alternative F would result in a marginal increase in traffic during operation and maintenance activities (11 daily truck trips) compared to the Proposed Action and all alternatives, Alternative F would have similar effects with respect to transportation and traffic as the Proposed Action and Alternatives B, C, and D during operation and maintenance.

3.16.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G were implemented, no Project-related changes would occur, and the existing environmental setting described in Section 3.16.2 would be maintained. As a no-development alternative, Alternative G would result in no changes to existing transportation and traffic conditions; therefore, no impact would occur.

3.16.7 Cumulative Effects

This analysis of cumulative transportation and traffic impacts focuses on the roadway segments that would be affected by the Proposed Action (e.g., within the I-15 corridor), because this is the only geographic area where the transportation and traffic impacts of the Project could combine with such impacts caused by past, present, and reasonably foreseeable future projects. Because the volume of traffic generated by the Project during construction and decommissioning would not be particularly large and would be substantially less during operation and maintenance activities, only the segments of I-15 in proximity to the Project site would experience any appreciable increase in traffic. Therefore, the geographic scope for cumulative impacts consists of the immediate vicinity of the proposed Project site where other projects might contribute traffic to the same segments of I-15. The Project would contribute to cumulative traffic conditions within the relevant geographic area during construction, operation, maintenance, and decommissioning.

Existing cumulative conditions (as described in Section 3.16.2, *Regional and Local Environmental Setting*) reflect the ongoing contributions to transportation and traffic conditions resulting from past projects. This analysis considers the effects of the Proposed Action and other alternatives in combination with the effects of these past projects as well as other present and reasonably foreseeable future projects.

Five of the projects listed in Table 3.1-3 in Section 3.1, *Introduction*, have been approved and environmentally cleared for construction; however, only two projects are currently under construction and would be operational by Year 2014, which is when the Proposed Action is scheduled to begin construction (summer 2014), i.e., the Abengoa Mojave Solar Project (over 75 miles west of the Project site) and the Ivanpah Solar Electric Generating System Project (located over 65 miles east of the Project site). Once implemented, these projects would contribute to traffic conditions on I-15 during the Project's construction. It is assumed that the remaining cumulative projects would come online and contribute to traffic conditions along I-15 during the latter stages of Project construction, or during its operation, maintenance, or decommissioning.

Cumulative impacts would be greatest if the peak construction period of all of the projects listed in Table 3.1-3 overlapped. Although this worst-case scenario is unlikely, even if it were to occur, it is unlikely that the LOS along I-15 would degrade to unacceptable service levels (worse than LOS E, which is the allowable limit in the SANBAG CMP) because segments of I-15 near the Project site currently operate at LOS A. Additionally, as stated above, Project-generated traffic during any phase would not be substantial enough to degrade freeway LOS to unacceptable conditions.

Cumulative impacts to segments of I-15 have been considered because it is likely that construction vehicle trips from foreseeable future projects and the Project would have the greatest potential to combine cumulatively on I-15. It is likely that a portion of construction traffic, including worker and haul trucks, for all projects listed in Table 3.1-3 would traverse the same portion of I-15 as Project construction-related traffic. Although the construction period, workforce, and schedule for the majority of foreseeable future projects are generally unknown, in a worst-case scenario where construction peak periods overlapped for all projects proposed in the Project area, the LOS of I-15 could be temporarily degraded, but likely would not be degraded below the acceptable LOS E, and would not result in permanent LOS degradation. Levels of congestion (delay) at on- and off-ramps along I-15 could be adversely affected due to the temporary influx of construction-related traffic; however, even a worst-case scenario would not likely exceed the capacity of I-15, which in this area has two lanes in both directions to accommodate the anticipated increase in traffic while maintaining adequate traffic flow along the freeway mainline.

APMs would reduce the Project's construction-related contribution to cumulative traffic conditions. However, even with the APMs, implementation of a coordinated Transportation Management Plan is recommended to reduce the Project's contribution to potential adverse traffic impacts to the surrounding network. Implementation of Mitigation Measure 3.16-1 would reduce potential cumulative construction-related traffic impacts.

Operation and maintenance is estimated to generate a total of about 40 daily round trips beginning at the conclusion of the 24- to 30-month construction period (i.e., Fall 2016); Alternatives B, C, and D would result in a similar number or fewer trips and would likely begin operation and maintenance slightly earlier than the Proposed Action due to their shorter construction periods. Alternative F would add up to 11 daily round trips to those anticipated for the Proposed Action. All of these trips could be accommodated by I-15 when their impacts are considered together with the impacts of trips generated by other projects in the cumulative scenario. In other words, the current capacity of I-15 would not be substantially adversely affected by the addition of the Proposed Action's 40 daily round trips and Alternative F's additional 11 daily round trips together with the approximately 12 daily round trips generated by the Stateline Solar Farm Project (BLM, 2012), 12 daily round trips generated by the Silurian Valley Wind Project (Pacific Wind, 2011), and similarly sized permanent workforces of other projects in the cumulative scenario that would be accessed via I-15.

The Project's contribution to cumulative traffic conditions during decommissioning and restoration is unknown, as is the number and proximity of cumulative projects that will be developed in the area within the next 30 years. For purposes of this analysis, it is assumed that the

Project's contribution to cumulative conditions at that time would be comparable to its contribution during Project construction, and the Transportation Management Plan required under Mitigation Measure 3.16-1 would address decommissioning related effects to traffic on I-15.

3.16.8 Mitigation Measures

Mitigation Measure 3.16-1: Prior to the initiation of construction and decommissioning activities, the Applicant shall develop a Transportation Management Plan and work with San Bernardino County to prepare and implement a coordinated transportation management plan for roadways adjacent to and directly affected by the planned Project activities and facilities, and to address the transportation impact of the multiple projects within the vicinity of the Project in the region. The transportation management plan shall include, but not be limited to, the following requirements:

1. Coordination between the contractor, the BLM, Caltrans, and San Bernardino County in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:

    a. Full and partial roadways closures;

    b. Use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices;

    c. Bicycle detour plans, if/where applicable;

    d. Parking along arterial and local roadways; and

    e. Identification of haul routes for construction trucks and truck staging areas to avoid off-site queuing that affects area roadways for instances when multiple trucks arrive or leave the work site simultaneously.

2. Cooperation with the BLM, Caltrans, and County, as appropriate, regarding their coordination of individual transportation management plans for the Project and nearby projects.

3. Development and implementation of BLM-, Caltrans-, and County-approved protocols for updating the transportation management plan to account for delays or changes in the schedule of the Project.

4. Prior to issuance of grading permits, the Applicant shall enter into a maintenance agreement with the County of San Bernardino, Department of Public Works, Transportation Operations Division to insure all County-maintained roads used by construction traffic shall remain in acceptable condition during construction. Prior to occupancy/final inspection, the Applicant shall comply with the maintenance agreement during construction if applicable and/or assure that all County-maintained roads affected by the Project during construction shall be restored to pre-construction condition. The Applicant shall contact the County Department of Public Works, Transportation Operations Division to arrange for inspection.

3.16.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts related to transportation and travel management would remain. Following the

implementation of Mitigation Measure 3.16-1 identified in Section 3.16.8, the amount of Project-generated traffic within the study area would remain, but would not contribute traffic to I-15 or other area roadways in amounts that would cause substantial adverse cumulative effects to roadway capacity.

3.16.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section XVI, a project would have a significant impact on transportation and traffic if it would:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

b) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks;

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

e) Result in inadequate emergency access; or

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

3.16.10.1 Alternative A: Proposed Action

a) Impact Trans-1: The Proposed Action would not conflict with the established measure of effectiveness (LOS) for the performance of I-15. (Less than Significant)

Tables 3.16-3 and 3.16-4, above, summarize the freeway segment operations along I-15 given the projected traffic volumes associated with the Project. These tables show that segments along I-15 would continue to operate at acceptable service levels (LOS A) during the weekday peak hour. In addition, the increase in traffic generated by the Project during construction, operation, maintenance, and decommissioning activities would not result in temporary or permanent changes to the performance of any transit, bicycle, and pedestrian facilities in proximity to the Project site. Therefore, the addition of Project-related construction, operation, maintenance, and decommissioning traffic would not affect the surrounding circulation system and would result in a less-than-significant impact. No mitigation measures would be required. This less-than-significant, Project-specific impact to performance capacity of I-15 would not be cumulatively considerable when considered in combination with the impacts generated by traffic contributed by other projects in the cumulative scenario for the reasons discussed in Section 3.16.7.

b) Impacts Trans-2: The Proposed Action would not conflict with the SANBAG CMP. (Less than Significant)

The Project site is located within San Bernardino County, which has established LOS standards implemented by the SANBAG, the County's CMA. The CMA has LOS standards and a documented CMP that is intended to regulate long-term traffic impacts due to existing and future development and such standards would not apply to temporary construction activities related to the Project (24 to 30 months). However, the Project would have a life-span of 30 years, depending on permit extension, followed by a decommissioning period, and would be considered to have long-term traffic effects to I-15 and nearby roadways. As discussed above, the construction and decommissioning activities associated with Project would generate the highest amount of traffic; however, the increase in traffic from these activities would be temporary, each occurring within a 24- to 30-month period. Furthermore, as shown in Tables 3.16-3 and 3.16-4, the increase in traffic from construction, operation, maintenance, and decommissioning activities would not result in any degradation in levels of service along I-15. Because the construction, operation, maintenance, and decommissioning of the Project would not result in any long-term impacts on CMP facilities, the impacts to the CMP roadway network and established programs would be less than significant. No mitigation measures would be required. This less-than-significant, Project-specific impact related to consistency with the SANBAG CMP would not be cumulatively considerable when considered in combination with the impacts generated by traffic contributed by other projects in the cumulative scenario because SANBAG CMP facility planning occurs within a cumulative conditions context - the Project has been determined to be consistent with that context.

c) The Proposed Action would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks (No Impact)

The nearest airport to the Project site is Baker Airport, located approximately 7 miles northeast of the site. The airport is owned by the BLM and includes one runway. Neither of the airstrips in the Project vicinity is in use. The Project involves no components or activities that would change air traffic patterns (e.g., as a result of structure height, glint or glare, or microwave or other radio signal interference), increase air traffic levels, or result in a change in location that would result in substantial safety risks. Therefore, the construction, operation, maintenance, and decommissioning of the Project or any of the alternatives would cause no impact related to criterion c, and no mitigation measures are required. Because the Project would cause no impact related to criterion c, it would not cause or contribute to any cumulative effect relating to air traffic safety risks.

d) Impact Trans-3: The Proposed Action would not substantially increase hazards due to a design feature or incompatible use. (Less than Significant)

The Project would not change the roadway network, with the exception of realigning Rasor Road to provide access to the specific Project components (solar array areas and operation and maintenance building). In addition, truck trips associated with the construction and decommissioning of the proposed facilities on the Project site would temporarily change the mix of vehicle types on area roads. Traffic safety hazards could occur due to: (1) conflicts where construction vehicles access a public right-of-way from the Project area; (2) conflicts where road

width is narrowed; or (3) increased truck traffic in general (and their slower speeds and wider turning radii) during construction, operation, maintenance, and decommissioning.

As described with respect to CEQA significance criterion a, the increase in weekday peak-hour traffic volumes resulting from construction and decommissioning-related traffic generated by the Project would not be substantial relative to the background traffic volumes on roads used to access the site. In addition, because the Project would include designated laydown and staging areas for worker vehicles and equipment, and because construction and decommissioning-related activities would generally occur outside typical weekday peak traffic periods, and a series of APMs would be implemented by the Applicant to reduce potential adverse transportation effects (see Section 3.16.5), potential adverse traffic safety hazards on adjacent roadways due to Project-related activities and vehicle trips, would be reduced to a less-than-significant level. This less-than-significant, Project-specific impact related to hazards associated design features or incompatible uses would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario for the reasons discussed in Section 3.16.7.

e) Impact Trans-4: The Proposed Action would not result in inadequate emergency access to the Project site. (Less than Significant)

Construction, operation and maintenance, and decommissioning activities would occur along specific corridors and easements within the Project area. No roadways would be closed during such activities, with the exception of the realignment of Rasor Road; however, closure of the existing roadway would be temporary, and the newly realigned roadway would be available for all user types (Project-related and general public). In addition, drivers of vehicles traveling behind a slow-moving heavy truck would be slowed, but rules of the road dictate that emergency vehicles have the right-of-way, and Project-related activities would not substantially impair emergency access. APM 31 would require that emergency access to the site shall be maintained at all times (see Section 3.16.5) and therefore, this impact would be less than significant. This less-than-significant, Project-specific impact related to the adequacy of emergency access to the site would not be cumulatively considerable when considered in combination with the impacts contributed by other projects in the cumulative scenario because none of the cumulative projects would generate traffic that would impede emergency access to the Project site.

f) The Proposed Action would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (No Impact)

During construction, operation, maintenance, and decommissioning, vehicles would access the Project site via I-15, Rasor Road, and Blue Bell Mine Road. As described in the context of criterion a, above, the traffic increases during Project activities would not result in the disruption to any transit service, or to bicycle and pedestrian facilities or to users of such facilities, primarily because there are no transit routes or bicycle and pedestrian facilities located at or within the Project site. As a result, the Proposed Action would result in no impact on alternative transportation facilities during construction, operation, maintenance, or decommissioning.

Because the Proposed Action would cause no impact related to criterion f, it would not cause or contribute to any cumulative effect relating to public transit, bicycle, or pedestrian facilities.

3.16.10.2 Alternative B

CEQA significance for Alternative B would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to conflicting with applicable transportation policies and congestion management plans, increasing transportation hazards, and resulting in inadequate emergency access. In addition, implementation of APMs would further reduce potential impacts to a less-than-significant level. For the same reasons as were discussed in Section 3.16.10.1, Alternative B-specific incremental impacts also would not be cumulatively considerable.

3.16.10.3 Alternative C

CEQA significance for Alternative C would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to conflicting with applicable transportation policies and congestion management plans, increasing transportation hazards, and resulting in inadequate emergency access. In addition, implementation of APMs would further reduce potential impacts to a less-than-significant level. For the same reasons as were discussed in Section 3.16.10.1, Alternative C-specific incremental impacts also would not be cumulatively considerable.

3.16.10.4 Alternative D

CEQA significance for Alternative D would be similar, or result in a reduced effect compared to that of the Proposed Action with respect to conflicting with applicable transportation policies and congestion management plans, increasing transportation hazards, and resulting in inadequate emergency access. In addition, implementation of APMs would further reduce potential impacts to a less-than-significant level. For the same reasons as were discussed in Section 3.16.10.1, Alternative D-specific incremental impacts also would not be cumulatively considerable.

3.16.10.5 Alternative E: No Action/No Project

Because it would not result in vehicle or truck trips to the Project site, or in changes at or near the Project site that could affect existing transportation systems, Alternative E would result in no impact to transportation and traffic. Because it would cause no impact to any of the CEQA criteria considered above, Alternative E would not cause or contribute to any cumulative effect to traffic or transportation.

3.16.10.6 Alternative F: CEQA No Project

CEQA significance for Alternative F would be similar or reduced compared to that of the Proposed Action with respect to conflicting with applicable transportation policies and congestion management plans, increasing transportation hazards, and resulting in inadequate emergency access. In addition, implementation of APMs would further reduce potential impacts to a less-than-significant level. As described in Section 3.16.6.6, the addition of truck trips associated with importing all water to the site would not change the LOS on I-15. For the same reasons as were

discussed in Section 3.16.10.1, Alternative F-specific incremental impacts also would not be cumulatively considerable.

3.16.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Because it would not result in vehicle or truck trips to the Project site, or in changes at or near the Project site that could affect existing transportation systems, Alternative G would result in no impact to transportation and traffic. Because it would cause no impact to any of the CEQA criteria identified above, Alternative G would not cause or contribute to any cumulative effect to traffic or transportation.

References

Airnav, 2013. Baker Airport – Federal Aviation Administration (FAA) Report, effective May 2, 2013. [http://www.airnav.com/airport/0O2] Accessed June 6, 2013.

Bureau of Land Management (BLM), 2012. Desert Stateline Solar Farm Project Draft EIS/EIR. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.47817.File.dat/Stateline%20Solar%20Farm%20Draft%20EIS-EIR%20-%20Nov%202012_508.pdf]

California Department of Transportation (Caltrans), 2012a. *2011 Traffic Volumes on California State Highways*. [http://traffic-counts.dot.ca.gov/index.htm] Accessed June 2013.

California Department of Transportation (Caltrans), 2012b. *Caltrans Traffic Volumes Report OTM32520 – Detailed All Vehicle Hourly Count (September 1, 2012 – September 30, 2012)*, provided by Caltrans District 8 Staff, Traffic Stations 907; prepared for Environmental Science Associates, November 14, 2012.

California Department of Transportation (Caltrans), 2012c. *California Manual on Uniform Traffic Control Devices – Part 6 Temporary Traffic Control*.

Federal Aviation Administration (FAA), 2013. Airport Master Record, Baker Airport. August. [http://www.gcr1.com/5010web/REPORTS/0O2.pdf]

Fulton, Robert, 2013. Personal communication, July 8, 2013.

Pacific Wind, 2011. Silurian Valley Wind Project Plan of Development.

Pan Environmental, Inc., 2013. Air Quality and Greenhouse Gas Impact Analysis Soda Mountain Solar Project. May.

Panorama Environmental, Inc., 2013a. *Soda Mountain Solar Transportation and Public Access Analysis*, May.

Panorama Environmental, Inc., 2013b. Soda Mountain Solar Project Revisions to March 2011 Plan of Development. March.

San Bernardino Association of Governments (SANBAG), 2009. *Congestion Management Program for San Bernardino County – 2009 Update.*

San Bernardino Association of Governments (SANBAG), 2013. Information on forthcoming adopted 2012 Congestion Management Program. [http://www.sanbag.ca.gov/planning2/congestion-mgmt.html] Accessed June 13, 2013.

Transportation Research Board, 2000. *2000 Highway Capacity Manual*.

3.17 Utilities and Public Services

3.17.1 Introduction

This section describes the existing utilities and public services generally available in the vicinity of the Project and provides an overview of available infrastructure as relevant to potential impacts that could occur with implementation of the Proposed Action or other alternatives. The information used for this analysis came from studies prepared for the Applicant, agency websites, and author reviews of maps and satellite imagery of the Project site and surrounding area.

Because utilities and public services are considered under CEQA but not under NEPA, this analysis focuses solely on potential CEQA impacts.

3.17.2 Regional and Local Environmental Setting

3.17.2.1 Water Supply

Groundwater is the sole water supply source available in the vicinity of the Project site. The only known well is 760-foot-deep and located on the Rasor Road service station property just beyond the southwest corner of the proposed ROW boundary, near the intersection of I-15 and Rasor Road. This well is capable of delivering approximately 1,500 gallons of water per day (RMT, 2011b). The nearest commercial water provider to the Project site is the Baker Community Services District (BCSD) in Baker, approximately 6 miles to the northeast (BCSD, 2013).

3.17.2.2 Wastewater Treatment

There are currently no wastewater treatment facilities on the Project site or in the surrounding area. The nearest sanitary sewer service to the Project site is provided by the BCSD (BCSD, 2013).

3.17.2.3 Stormwater

The Project site is located in the valley portion of the Soda Lake Watershed and is divided between two drainage basins, Basin A and Basin B. I-15 splits the two basins and redirects the historic stormwater runoff flow patterns that existed before the highway was constructed. The stormwater that is collected from I-15 run-off passes through multiple existing culverts located under the highway. Basin A has an outfall that exits northeasterly along the north side of I-15; Basin B has an outfall that exits southeasterly into the Mojave River Wash, which is the mouth of the Mojave River and outfalls into Soda Lake. Soda Lake is a desert basin with no outlet that periodically fills with water after a storm event to form a temporary lake. Two major outlet channels exist on the Project site along I-15. One channel drains Basin A along the west side of I-15 and another channel drains Basin B along the east side of the highway (RMT, 2011a).

3.17.2.4 Solid Waste Management

The San Bernardino County Solid Waste Management Division (SBCSWMD) is responsible for operation and management of the County's solid waste disposal system, which consists of five landfills and nine transfer stations. The nearest landfill to the Project site is the Barstow Sanitary Landfill located at 32553 Barstow Road; the nearest transfer station is located in Baker at 72799 Sodabaker Road (SBCSWMD, 2012). The Barstow Landfill has a maximum permitted throughput of 1,500 tons per day and a remaining capacity of 924,401 cubic yards. The estimated closure date for the landfill is 2071 (CalRecycle, 2012a).

3.17.2.5 Fire Protection

Fire protection services serving the Project site are under the jurisdiction of the San Bernardino County Fire Department (SBCFD). The SBCFD has 56 active fire stations and over 1,200 employees. The department serves 54 communities and five contract cities. In 2010, the SBCFD responded to over 68,000 emergency incidents. The Project site is located within Division 3 (High Desert), which has a service area of 74 square miles and includes a population of approximately 117,000 (SBCFD, 2012a). During fiscal year 2011-2012, there were over 18,000 calls for service placed to Division 3, of which over 11,000 were medical calls (SBCFD, 2012b). Station No. 53 is the nearest station to the Project site and is located at 72734 Baker Boulevard in Baker, approximately 7.5 miles from the Blue Bell Mine Road access point and 13.5 miles from the Rasor Road access point to the Project site. Daily staffing at this station consists of a full-time Captain and two paid-call firefighters (PCF). Other PCFs living in the area assist as necessary. Fire apparatus housed at the station includes one Type 1 structure engine and one Type 4 brush patrol unit. The second closest, Station No. 52, is located in Newberry Springs on I-15, approximately 30 miles southwest of the Project site. Daily staffing consists of a full-time Captain and a limited-term firefighter. They are augmented as needed by PCFs living in the area. The fire apparatus housed at this station includes one Type 1 structure engine and one Type 4 all-wheel drive brush patrol unit (SBCFD, 2012a).

The SBCFD does not currently have established performance standards; however, the San Bernardino County General Plan contains policies and programs related to fire protection services calling for the adoption of a Countywide Fire Protection Master Plan that would use National Fire Protection Association (NFPA) Standards 1710 and 1720 as goals for creation of standards of cover (San Bernardino County, 2007). For locations within 8 miles of a station (e.g., the North Array via the Blue Bell Mine Road access point), these standards call for a response time of fewer than 14 minutes for the arrival of the first company to 90 percent of incidents and a minimum of six personnel. For locations further than 8 miles from a station (e.g, the South and East arrays via the Rasor Road access point), the standards do not specify a response time, but suggest a minimum of four personnel to respond to incidents in remote areas (NFPA, 2010a, b).

3.17.2.6 Law Enforcement

The Project site is located within the service area of the San Bernardino County Sheriff-Coroner's Department (SBCSCD). The SBCSCD has a staff of over 3,700 and has 10 stations located

throughout the County. The department also provides law enforcement services on a contract basis to 14 of the 24 incorporated cities in San Bernardino County. The nearest sheriff's office to the Project site is the Barstow/Trona Station located at 225 East Mountain View Road in Barstow, approximately 50 miles southwest of the site (SBCSCD, 2012). The Barstow/Trona Station patrols an area of 9,219 square miles and serves a population of over 23,000. In 2011, the station employed 19 patrol deputies and had 21,015 calls for service. Traffic collision investigations within unincorporated areas of the County are handled by the California Highway Patrol (SBCSCD, 2011). A satellite substation to the Barstow/Trona Station is located in Baker, approximately 6 miles to the northeast of the Project site. The Baker Substation is known as a "resident post" as deputies assigned to this substation live in housing provided by the County. Deputies serving the Barstow/Trona area also work regularly with the California Highway Patrol and BLM Rangers (SBCSCD, 2012).

3.17.2.7 Schools

The Project site is located within the Baker Valley Unified School District (BVUSD). The district operates three schools: elementary, junior high, and high school, all of which are located in Baker. There were a total of 191 students enrolled in the BVUSD during the 2011-12 academic year (California Department of Education, 2012). Construction workers with school age children also may reside in Barstow, which is served by the Barstow Unified School District (BUSD). The district serves approximately 6,000 students and operates twelve schools in the Barstow area (BUSD, 2013).

3.17.2.8 Other Public Facilities

The nearest hospital with an emergency room to the Project site is Barstow Community Hospital located at 820 East Mountain View Street in Barstow. The Barstow Branch of the San Bernardino County Library is located at 304 East Buena Vista Street in Barstow.

3.17.3 Applicable Laws, Regulations, Plans, and Standards

3.17.3.1 Federal

California Desert Conservation Area Plan of 1980, as amended

The CDCA encompasses 25 million acres in southern California designated by Congress in 1976 through the FLPMA. The BLM manages about 10 million of those acres. The CDCA Plan provides overall regional guidance for BLM-administered lands in the CDCA and establishes long-term goals for protection and use of the California desert. The Project site is located within the area covered by the Plan (see Figure 1-2). The CDCA Plan indicates that no hazardous or non-hazardous waste disposal is allowed on any part of the Project site. Thus, any solid waste generated by the Proposed Action or another alternative would require off-site disposal.

3.17.3.2 State

Senate Bill 901, 610, and 267, Water Supply Assessment

Senate Bill (SB) 901 was enacted in 1995 to ensure that cities and counties assess the adequacy of available water supplies to meet projected water demand prior to approving certain types of new land development projects. SB 901, also known as the Water Supply Assessment (WSA) law, requires that before a project is granted approval, the city or county must request preparation of a WSA by the public water supplier that will serve the project. The provisions of SB 901 were codified in Water Code Sections 10910 through 10915.

SB 610 was enacted in 2001 to improve the WSA process and expand the scope of development projects triggering the WSA procedure. The primary goal of SB 610 was to improve the linkage between water use and land use planning to ensure that land use decisions for specific large development projects have adequate information to assess whether sufficient water supplies are available to meet project demands. The 2001 bill also required additional information with respect to groundwater supplies. In 2011, SB 267 was enacted to revise the definition of a project to include new renewable energy projects. Section 10912(a)(7)(B) of the Water Code specifies that a proposed photovoltaic generation facility is not a "project" subject to the provisions of SB 610 if the facility would demand no more than 75 acre-feet of water annually.

Water demand for the Project is described in Section 2.4.2.7. The operational water demand would be 33 acre-feet per year (AFY). The construction water demand is 192 AFY for three years. Because the annualized water demand is approximately 46 AFY over 30 years, it demands less than 75 acre-feet (AF) of water annually and is not subject to the provisions of SB 610.

14 California Code of Regulations Division 7.3

Title 14, Division 7, Chapter 3 of the California Code of Regulations (14 Cal. Code Regs. §17200 et seq.) provides minimum requirements for solid waste handling and disposal within the state. The regulations implement standards for the disposal and storage of solid waste, for nonhazardous wastes, and including solid wastes from industrial sources. Specific requirements are included for the handling and disposal of construction and demolition wastes, nonhazardous contaminated soil, waste tires, nonhazardous ash, and inert debris. Additional requirements are provided for transfer and processing facilities, siting and design standards, operation, and record-keeping and reporting.

22 California Code of Regulations Division 4.5

Title 22, Division 4.5 of the California Code of Regulations (22 Cal. Code Regs. §66250 et seq.) discusses an array of requirements with respect to the disposal and recycling of hazardous and universal wastes. Specific standards and requirements are included for the identification, collection, transport, disposal, and recycling of hazardous wastes. Additional standards are included for the collection, transport, disposal and recycling of universal wastes, defined as those wastes identified in Title 22, Section 66273.9, including batteries, electronic devices, mercury-containing equipment, lamps, cathode ray tubes, and aerosol cans. Requirements include recycling, recovery, returning spent items to the manufacturer, or disposal at an appropriately

permitted facility. Title 22, Division 4.5 also provides restrictions and standards relevant to waste destination facilities, and provides authorization requirements for various waste handlers. Note that Title 22 includes California's Universal Waste Rule, as well as other additional waste handling and disposal requirements.

27 California Code of Regulations Division 2

Title 27, Division 2 of the California Code of Regulations (27 Cal. Code Regs. §20005 et seq.) implements regulations of CalRecycle and the State Water Resources Control Board (SWRCB) with respect to disposal of wastes on land. The regulations implement a waste classification and management system, which determines whether or not wastes are compatible with containment features of specific disposal facilities, and whether or not wastes are considered hazardous. Additional requirements are included for the waste disposal sites, including construction standards, liner requirements, siting criteria, and operational management requirements. Water quality monitoring requirements are also included, along with associated contamination response programs. Finally, disposal facility closure and post closure requirements, compliance with reporting programs, and financial assurance requirements are also included.

Integrated Waste Management Act

The Integrated Waste Management Act was enacted in 1989 as AB 939 and codified in Public Resources Code Section 40050 et seq. The Act required each of the cities and unincorporated portions of counties throughout the state of California to divert a minimum of 25 percent of solid waste from landfills by 1995 and 50 percent by 2000. Diversion includes waste prevention, reuse, and recycling. To attain these goals for reductions in disposal, the Act established a planning hierarchy utilizing integrated solid waste management practices. The Act resulted in the creation of the California Integrated Waste Management Board, which now is known as CalRecycle. Under the Act, jurisdictions also have to submit solid waste planning documentation to CalRecycle. The Act also set into place a comprehensive statewide system of permitting, inspections, and maintenance for solid waste facilities, and authorized local jurisdictions to impose fees based on the types and amounts of waste generated.

Since 2007, CalRecycle has measured solid waste diversion rates by comparing reported disposal tons to population to calculate per capita disposal, expressed in pounds per person per day (PPD). The per capita disposal rate is a jurisdiction-specific index used as one of several factors in determining a jurisdiction's compliance with AB 939 that allows jurisdictions, as well as CalRecycle, to set their primary focus on successful implementation of diversion programs (CalRecycle, 2011b). CalRecycle measures per capita disposal rates for two measures of population, the total number of residents of a local jurisdiction ("population") and the estimate of the annual average number of people employed at businesses within the jurisdiction ("employment"). For most jurisdictions, CalRecycle uses population disposal rates to set diversion goals. For jurisdictions whose primary source of solid waste is business, CalRecycle may use the employment disposal rates. In 2011, unincorporated San Bernardino County had an annual population disposal PPD of 4.7, which is below the County-specific target maximum of 6.2 PPD. The County also met the County-specific employment disposal target of 43.3 PPD by having an annual disposal of 30.0 PPD (CalRecycle, 2012b).

3.17.3.3 Local

San Bernardino County General Plan

The following policies identified in the Circulation and Infrastructure element of the San Bernardino County General Plan address public utilities and services and therefore are relevant to this analysis (San Bernardino County, 2007).

> ***Policy CI 9.1*:** Control the timing and intensity of future development and ensure that future development is contingent on the provision of infrastructure facilities and public services.
>
> ***Policy CI 9.2*:** Promote the least intensive uses in areas with minimal infrastructure facilities and public services. The more intensive uses are permitted in areas where urban level infrastructure facilities and public services currently exist or can reasonably be extended.
>
> ***Policy CI 11.1*:** Apply federal and state water quality standards for surface and groundwater and wastewater discharge requirements in the review of development proposals that relate to type, location and size of the proposed project to safeguard public health.
>
> ***Policy CI 11.12*:** Prior to approval of new development, ensure that adequate and reliable water supplies and conveyance systems will be available to support the development, consistent with coordination between land use planning and water system planning.
>
> ***Policy CI 12.11*:** Prior to approval of new development, ensure that adequate and reliable wastewater systems will be available to support the development, consistent with coordination between land use planning and wastewater system planning.
>
> ***Policy CI 13.1*:** Utilize site-design, source-control, and treatment control best management practices (BMPs) on applicable projects, to achieve compliance with the County Municipal Stormwater NPDES Permit.
>
> ***Policy CI 14.1*:** Utilize a variety of feasible processes, including source reduction, transfer, recycling, land filling, composting, and resource recovery to achieve an integrated and balanced approach to solid waste management.
>
> ***Policy CI 16.3*:** Encourage development in areas that have adequate infrastructures for the provision of fire service, which include, but are not limited to, water systems capable of delivering appropriate fire flow, and transportation networks that can provide access for fire apparatus and other emergency response vehicles as well as provide efficient egress for evacuees.
>
> ***Policy D/CI 2.1*:** Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.
>
> ***Policy D/CI 4.1*:** Promote public services commensurate with the rural character and rural lifestyles of the residents of the Desert Region.
>
> ***Policy D/CI 4.2*:** The County shall require all new development with the potential for functional impacts on the delivery of public services and infrastructure capacity prepare a service impact analysis and implement mitigation measures to avoid additional burdens on

the existing developed areas and to ensure the continued availability of the appropriate levels of service.

***Policy D/CI 4.3*:** Commercial and industrial development in rural areas shall ensure that adequate infrastructure is provided.

San Bernardino Countywide Integrated Waste Management Plan

State law requires counties in California, in conjunction with their cities, to prepare a Countywide Integrated Waste Management Plan (CIWMP) to reduce dependence on landfilling solid waste, and to ensure an effective and coordinated effort to safely manage solid waste generated within the state. The San Bernardino CIWMP includes a Source Reduction and Recycling Element, Countywide Siting Element, Household Hazardous Waste Element, and a Non-Disposal Facility Element. The CIWMP contains goals and policies that profile the County's current waste as well as a summary of integrated waste management issues faced by the County and strategies being utilized in its approach to these issues. It summarizes waste management programs designated by the County's jurisdictions to meet their 50 percent waste reduction mandates and suggests steps necessary to cooperatively implement and administer specific programs regionally or countywide (San Bernardino County, 2012).

San Bernardino County, Department of Public Works, Solid Waste Management Division

San Bernardino County has adopted the California Green Building Standards Code (CALGreen), which includes mandatory construction and demolition waste recycling (San Bernardino County, 2013). Projects that have the potential to generate construction and demolition waste are required to submit a Construction and Demolition Solid Waste Management Plan (WMP) to identify the estimated quantity and location of recycling for construction and demolition waste resulting from the project. The goal of the WMP is to recycle, reuse, compost, and/or salvage a minimum of 50 percent by weight of the waste generated on site. The WMP must be approved by the Solid Waste Management Division prior to issuance of building permits. An "Actual Material Disposal/Diversion Worksheet" is required upon completion of construction that demonstrates the actual quantity of construction and demolition waste recycled.

3.17.4 Analytical Methodology

This section describes the conditions related to utilities and public services that would occur during construction, operation, maintenance, and decommissioning of the Proposed Action and alternatives.

Potential impacts of the Proposed Action and alternatives regarding wastes are evaluated in terms of landfill capacity and compliance with applicable laws, ordinances, regulations, and policies for both solid wastes and wastewater (listed in Section 3.17.3), which have been established to ensure the safe and proper management of applicable wastes in order to protect human health and the environment.

To evaluate water availability, a Hydrogeological Conditions and Groundwater Modeling Report (RMT, Inc., 2011b) and Addendum (TRC Solutions, 2013) were completed for the Project. Water demands of the Project are discussed in Chapter 2, *Proposed Action and Alternatives*; additional detail is provided in Section 3.19, *Water Resources*. The water demands of all build alternatives were evaluated in comparison with the available water supply and historic regional water consumption levels.

3.17.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5); however, there are no APMs to address potential impacts to utilities and service systems or public services.

3.17.6 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G Section XVII, a project would cause adverse impacts to utilities and service systems if it would:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

c) Require or result in the construction of new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects;

d) Have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements needed;

e) Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;

f) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or

g) Not comply with federal, state, and local statutes and regulations related to solid waste.

Further based on the CEQA Guidelines Appendix G Section XIV, a project would cause adverse impacts to public services if it would:

h) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

    i) Fire protection

ii) Police protection

iii) Schools

iv) Parks

v) Other public facilities

The analysis below evaluates potential impacts related to fire and police protection, schools, and other public facilities. Potential impacts to parks as contemplated by significance threshold h(iv) are analyzed in Section 3.13, *Recreation.*

3.17.6.1 Alternative A: Proposed Action

a) Impact Util-1: The Proposed Action could exceed the wastewater treatment requirements of the Lahontan Regional Water Quality Control Board. (Less than Significant with Mitigation Incorporated)

Construction is not anticipated to result in the treatment of wastewater on site. Portable toilets would be utilized during construction and wastes would be removed by qualified waste disposal contractors and disposed of in accordance with all applicable regulations and codes. No impact would result.

As discussed in Chapter 2, *Proposed Action and Alternatives*, operation and maintenance may require treatment of pumped groundwater. If the groundwater analysis indicates that treatment is required, a reverse osmosis (RO) system would be used to reduce total dissolved solids (TDS) concentrations to acceptable levels for potable water use (even though groundwater would not be used for human consumption), fire suppression, and PV panel washing. The high-TDS reject water from the RO system would be stored in on-site brine ponds. The water treatment system would be sized to provide enough water for panel washing and site operations. Brine that is too high in TDS content to be used for other Project purposes would be piped to brine ponds, where the liquid would evaporate, leaving salts and minerals that would be cleaned out periodically and disposed of at a licensed landfill. The side slopes of the brine ponds would be constructed of earthen berms from on-site soils. The brine ponds would be constructed with a plastic liner and a leak detection system designed and constructed as a Class II Waste Management Unit in accordance with California Code of Regulations Title 27 Guidelines described in Section 3.19.3.2. The ponds would be permitted in accordance with requirements of the Lahontan Regional Water Quality Control Board (RWQCB).

Other wastewater generated on site would be composed of sanitary sewage from restroom and washing facilities and other on-site uses. This wastewater would be collected and treated using an on-site septic system. The septic system would be designed and constructed adjacent to the long-term buildings. The system would be designed in accordance with applicable standards. A percolation report and plot plans would be submitted to the San Bernardino County Division of Environmental Health Services for review and approval, and an associated permit application would be submitted to the San Bernardino County Building and Safety Department. As discussed in Section 3.7, *Geology and Soil Resources*, on-site soils may be incapable of adequately supporting the use of septic tanks or any alternative wastewater disposal system. If on-site soils are incapable

of adequately supporting septic tanks or another wastewater disposal system installed for the Project, a significant impact would result. To ensure soils are adequate for septic tank installation and operation, the Applicant would need to conduct proper geotechnical and engineering geology studies to investigate and evaluate the soil and geologic formations and assess soil permeability and percolation characteristics. Implementation of Mitigation Measure 3.7-3 would ensure that adverse impacts related to the capacity of soils to support septic tanks would be avoided or substantially reduced. Following implementation of Mitigation Measure 3.7-3, the impact of Project operation and maintenance would be less that significant.

Decommissioning would involve removal and/or abandonment in place of the water supply, water treatment, wastewater treatment, and stormwater facilities that are proposed. The removal of these facilities would adhere to applicable requirements of the LRWQCB. These requirements are discussed in greater detail in Section 3.19, *Water Resources*. No additional impact would occur.

The analysis of potential cumulative effects relating to potential exceedances of the wastewater treatment requirements of the Lahontan RWQCB considers the impacts of the Project in combination with the impacts of other projects included in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that would occur within the Mojave River Basin and those areas overlying the Soda Lake Valley Groundwater Basin. Neither the XpressWest High Speed Passenger Rail Project nor the Calnev Pipeline Expansion Project would construct any wastewater treatment facilities (e.g., septic tanks or evaporation ponds), and so could not contribute to a cumulative effect with respect to this criterion (BLM and San Bernardino County, 2012; FRA, 2011). As described above, the Proposed Action would comply with all applicable Lahontan RWQCB requirements with respect to the brine ponds and septic system. Discharges to surface or groundwater from either of these wastewater treatment facilities would be very unlikely with adherence to applicable requirements. Because the other project in Table 3.1-3 also would be required to comply with the Lahontan RQWCB requirements for wastewater treatment systems, the same would be true of potential discharges from these projects. In the very unlikely event of failures of more than one of these wastewater systems, the potential discharges would be minor and geographically dispersed such that they would not combine to result in an adverse cumulative water quality impact. The Project would not have a cumulatively considerable contribution to a potential cumulative impact.

b) The Proposed Action would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. (No Impact)

The Proposed Action would not require any connections to local or regional water supply or wastewater treatment systems, and would not withdraw water from or provide wastewater to any such systems. The Proposed Action also would not require the construction or expansion of any off-site wastewater treatment facilities. However, the Proposed Action would install new facilities for the treatment of water and wastewater on site. As discussed previously, the Project would install an on-site septic system, and could involve the use of an evaporation pond for brine disposal. Because these new treatment facilities are part of the Proposed Action evaluated in this

PA/EIS/EIR, potentially significant environmental effects are addressed throughout Chapter 3 of this document. Decommissioning would involve removal and/or abandonment in place of the proposed facilities. The removal of these facilities would not affect the operation or function of wastewater treatment facilities that are located in the vicinity of the Project site. Therefore, no impact would occur related to the construction of new or expansion of existing water or wastewater treatment facilities.

Because the Project would result in no impact related to this significance threshold, it could not cause or contribute to any significant cumulative impact from the construction or expansion of water or wastewater treatment facilities.

c) Impact Util-2: The Proposed Action would require and result in the construction of new stormwater drainage facilities, the construction of which could cause environmental effects. (Less than Significant with Mitigation Incorporated)

The Proposed Action would include installation of new stormwater and drainage facilities on site, the construction of which could cause a significant adverse impact. However, as discussed in Section 3.19, *Water Resources,* the Proposed Action would not result in significant increases in downstream flow rates because Mitigation Measures 3.19-2 and 3.19-4 would require the Applicant to implement additional stormwater retention measures and facilities to accommodate increases in flows that would be generated as a result of the Proposed Action, in comparison to existing conditions, such that its implementation would not result in a net increase in discharge from the site for both smaller, more frequent events (2-, 5-, and 10-year events), as well as larger design storm events (100-year event). Therefore, the Proposed Action would not result in an increase in stormwater flows emanating from the Project site such that drainage systems located downstream would be insufficient to convey stormwater from the Project site, and no additional downstream facilities would be required. With implementation of mitigation measures, this impact would be reduced to less than significant.

Decommissioning would involve removal and/or abandonment in place of the proposed facilities. The removal of these facilities would not affect the operation or function of stormwater drainage facilities that are located in the vicinity of the Project site. Therefore, no impact would occur during this phase.

The analysis of potential cumulative effects resulting from the construction of new stormwater drainage facilities considers the impacts of the Project in combination with those of other projects in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that would cause or contribute to drainage facility impacts within the Mojave River Basin, which receives surface flow from the Project site. Other projects within this geographic area that could contribute to a cumulative effect include the XpressWest and Calnev projects and the Johnson Valley Military Expansion. These projects would not result in extensive development of new impervious surfaces within the Mojave River Basin. Construction and operation of these cumulative projects would result in installation of facilities and other earthworks, including various grading activities, and facilities installations that, independently or collectively, could alter on-site drainage patterns. It is expected that runoff

from these areas would be controlled through the implementation of the same or similar BMPs and other stormwater pollution prevention requirements to which the Project is subject. As described in Section 3.17.2, existing conditions in the affected environment do not indicated existing adverse conditions. The contribution of the incremental impacts of the Project and the cumulative projects would cause a less-than-significant cumulative impact, and the Project's contribution would not be cumulatively considerable.

d) Impact Util-3: There would be sufficient water supplies available to serve the Proposed Action from existing entitlements and resources. (Less than Significant)

Total construction period water demand is anticipated to be 384 to 480 AF over the 24- to 30-month construction period, plus 1.6 AFY of potable water that would be trucked to the site. Total operation period water demand is anticipated to be 33 AFY, which includes 1.6 AFY of potable water that would be delivered by truck and stored in an approximately 5,000-gallon potable water storage tank. Over the proposed 30-year operational period, total water demand would be between 1,275 and 1,371 AF.

The primary water supply for the Proposed Action would be groundwater pumped from the underlying aquifer. There is no industrial water purveyor in the area and no public water system with capacity to serve the Proposed Action, and other water sources (such as reclaimed water or surface waters) would require entitlement. Groundwater underlying the Project site is not adjudicated.[1] The Proposed Action's water needs could be met by proposed on-site groundwater wells. The proposed system would be classified by the CDPH as a non-community, non-transient water system because the Proposed Action's water system would provide water for use by on-site employees and to support solar plant operation and maintenance.

As discussed in Section 3.19, *Water Resources*, groundwater pumping simulations show that that there is adequate groundwater in the Soda Mountain Valley to support construction and operation of the Proposed Action without adversely affecting nearby wells or sensitive water resources (TRC Solutions, 2013). No new or expanded entitlements would be needed. The impact would be less than significant.

The analysis of potential cumulative effects to water supply availability considers the impacts of the Project in combination with those of other projects in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that would extract groundwater from the same aquifer as the Project. The temporal scope of impacts would include all phases of the projects, because some volume of groundwater typically is needed for construction and decommissioning activities (e.g., dust suppression), and operation and maintenance needs (e.g., panel washing and water service for operation and maintenance buildings). Reductions in groundwater levels and supply could occur either at the Project site or a neighboring project site if the combined amount of groundwater use associated with these projects results in a lowering of the groundwater levels sufficient to result in a cone of depression that intersects other water supply wells or water

[1] In adjudicated groundwater basins, the groundwater rights of all overliers and appropriators are court-determined.

features. Neither the XpressWest or Calnev projects, nor any of the other projects identified in Table 3.1-3 propose to use groundwater from the same basins affected by the Project. The amount of groundwater drawdown therefore would be determined solely by the Project. The Project's less-than-significant impact would not cause or contribute to a significant cumulative effect, and would not be cumulatively considerable.

e) The Proposed Action would not require the services of a wastewater treatment provider. (No Impact)

As discussed above, the Proposed Action would not require or result in a new connection to a wastewater treatment facility or provider, and no connection exists on site. Wastewater would be treated on site. Therefore, the Proposed Action would not contribute additional wastewater flows to any wastewater treatment provider or facility, and so would not use available capacity or require new capacity at any wastewater treatment plant. No impact would occur.

Because the Project would result in no impact to wastewater service treatment providers, it could not cause or contribute to any significant cumulative impact in this respect.

f) Impact Util-4: The Proposed Action would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs. (Less than Significant)

The Proposed Action would generate solid waste during construction, operation, maintenance, and decommissioning activities. All handling and processing of construction, demolition, and inert debris would be in accordance with applicable regulatory requirements as described in Section 2.4.2.10 and Section 3.17.2. Solid waste would include recyclable materials such as metals and plastics, as well as various construction materials and worker-generated waste that would include a combination of recyclable and non-recyclable materials. Appropriate materials would be recycled as described in Table 2-3, *Construction Waste Types, Volumes, and Management Approaches*, and as required in the Project-specific WMP prior to issuance of permits. Non-recyclable, non-hazardous solid waste materials would be landfilled in accordance with state and local regulations.

As described in Section 3.17.2.4, the Barstow Sanitary Landfill has a maximum permitted throughput of 1,500 tons per day and a remaining capacity of over 900,000 cubic yards. Construction would require disposal of approximately 21 cubic yards per week at a Class III landfill, as shown in Table 2-3.

CalRecycle estimates that construction debris can weigh between 400 and 2,400 pounds per cubic yard, depending on its contents (CalRecycle, 2013). Although the Project's construction debris would not consist primarily of asphalt or concrete because construction would not include the demolition of these materials, this analysis uses the higher weight estimate as a conservative assumption. The weight of 21 cubic yards at 2,400 lbs per cubic yard would be approximately 25 tons. Even if this amount of waste was delivered to the Barstow Sanitary Landfill in one day, the landfill would have an average of 1,475 tons remaining of its daily permitted capacity. Therefore, the solid waste generated during all phases would not exceed the capacity of this landfill to

accommodate the Proposed Action's or other regional waste disposal needs. Additionally, this landfill has sufficient total capacity to continue to provide solid waste disposal through 2071. Therefore, sufficient capacity is anticipated to be available for waste disposal, and this impact would be less than significant. Hazardous wastes are treated separately. Please refer to Section 3.8, *Hazards and Hazardous Materials*, for additional discussion of hazardous wastes.

Decommissioning would result in the generation of additional solid waste. Anticipated solid waste types include concrete, metal, plastics, and photovoltaic panels. Recyclable materials would be removed from the waste stream and recycled prior to disposal of solid waste in an approved landfill. Solar PV panels would be reused if possible and then recycled at the end of their useful life. Also, based on current estimates and permits, the Barstow Sanitary Landfill would still have at least two decades of remaining capacity available at the time of decommissioning. Therefore, sufficient capacity is expected to be available to support decommissioning.

Based on the anticipated landfill capacity described above, sufficient capacity would be available to handle disposal of non-recyclable waste generated by the Proposed Action, and this impact would be less than significant.

The analysis of potential cumulative effects to landfill capacity considers the impacts of the Project in combination with the impacts of other projects included in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that would dispose of solid waste at the Barstow Sanitary Landfill. There are two landfills that serve the High Desert: the Barstow Sanitary Landfill and the Victorville Landfill, which is located at 18600 Stoddard Wells Road in Victorville. Based on the proximity of the cumulative projects shown in Figure 3.1-1 to both landfills, this analysis conservatively assumes that all of the cumulative projects would dispose of their solid waste exclusively at the Barstow Sanitary Landfill unless otherwise indicated.[2]

Two of the cumulative projects are expected to be in the operation and maintenance phase (and so generating lesser volumes of solid waste) when construction of the Project would begin. Construction of the Ivanpah Solar Electric Generating System project is anticipated to be complete in 2013 (Table 3.1-3). The July 2010 CDCA Plan Amendment/Final EIS for the Ivanpah project (BLM, 2010) reports that the total amount of nonhazardous wastes generated from construction and operation of that project would contribute less than 0.1 percent of the remaining landfill capacity. Second, construction of the Abengoa Mojave Solar project is estimated to be complete in 2014. The amount of solid waste generated by the Abengoa project is

[2] For example, environmental review for the XpressWest High Speed Passenger Rail Project (cumulative project #6) was completed in October 2011. Although it is assumed that this project would generate construction-related volumes of solid waste at substantially the same as the Project, the environmental analysis for XpressWest makes clear that solid waste generated by that project is not expected to be directed to the Barstow Sanitary Landfill. Chapter 3 of the March 2011 Final EIS for the XpressWest project expects that project's solid waste to be directed primarily to the Victorville Landfill and the Apex Regional Landfill, each of which was identified as having "substantial remaining capacity to accept new waste" (FRA, 2011). Therefore, solid waste generated by XpressWest could not combine with solid waste to be generated by the Project to cause or contribute to a cumulative effect on the Barstow Sanitary Landfill.

described as "limited" in the DOE's July 2011 Final Environmental Assessment for that project (DOE, 2011).

Construction of the Silurian Valley Wind Project is proposed to begin in 2014 (Table 3.1-3), and so would be contributing construction waste at the same time as the Project; however, it currently is unknown what volumes of solid waste would be generated when (over what time period) by this project. An application for the Silurian Valley Solar project was received in August 2012, but a plan of development has not been approved, and as a result the potential impacts of this project on landfill capacity are not known. This analysis assumes that these projects would be approved and that their construction, operation and maintenance periods would overlap completely with those of the Project. This analysis also assumes that the volumes of solid waste to be generated would be comparable in terms of volume and timing to the Project, and, further, that all such waste would be sent to the Barstow Sanitary Landfill.

Draft environmental review for the Stateline Solar Farm completed in November 2012 reports that the project "would not generate solid waste in a volume that exceeds the capacity of existing facilities" (BLM, 2012). Draft environmental analysis published in March 2012 for the Calnev project assumes that the anticipated volumes, timing, and location of landfilling would be comparable in all respects to the Proposed Action.

Based on the anticipated landfill capacity described above for the Barstow Sanitary Landfill, sufficient capacity would be available to handle disposal of non-recyclable waste generated by the Proposed Action and each of the cumulative projects, resulting in a less-than-significant cumulative impact. The Project's contribution to the cumulative impact would not be cumulatively considerable.

g) The Proposed Action would comply with federal, state, and local statutes and regulations related to solid waste. (No Impact)

As required by the Solid Waste Management Division of the San Bernardino County Department of Public Works, the Applicant would prepare and submit for approval a WMP to indicate how it would reuse or recycle construction and demolition waste prior to building permits being issued. Additionally, a WMP would be required for wastes generated during decommissioning.

Disposal of spent oil, lubricants, and wastewater treatment and other chemicals could require special handling or disposal procedures. All waste flows generated on-site during construction, operation and maintenance, and decommissioning would be handled and disposed of in accordance with all applicable laws and policies. Therefore, no impact would occur.

Because the Project would result in no impact regarding consistency with solid waste requirements, it could not cause or contribute to any significant cumulative impact in this respect.

h) See individual public services discussions below for significance conclusions.

Construction-related population increases could occur in the local service area during a period of up to 30 months, particularly if as described in Section 3.14, *Socioeconomics and Environmental*

Justice, construction workers commute weekly to the local service area and make use of temporary housing options. This period could be long enough to affect planning for public service needs. Construction would result in an increase of 175 workers on average and up to 300 workers at peak times.

The Proposed Action also could result in an increase of up to 40 permanent, full-time personnel during operation and maintenance, which is expected to last 30 years or longer in the event that permit extensions are granted. Although operation and maintenance would be long-term, it would require substantially fewer workers than the construction phase, and therefore would have a reduced effect on the provision of public services in the Project vicinity compared to the construction phase. Although the Proposed Action would produce additional electricity compared to existing conditions, it is intended to meet the demand for energy that is already projected based on growth in communities around California and therefore would not induce growth.

Decommissioning is anticipated to require fewer workers and last a shorter amount of time than the construction phase. Therefore, it would have a reduced effect on the provision of public services in the Project vicinity compared to the construction phase.

h.i) The Proposed Action would not require the construction of new or physical alteration of existing fire protection facilities. (No Impact)

It is anticipated that all temporary construction- and decommissioning-related labor would be drawn from the local labor pool; however, if any temporary workers should move into the service area of the SBCFD from elsewhere, there are currently enough vacant housing units and other sources of housing to accommodate them (see Section 3.14, *Socioeconomics and Environmental Justice*). Because existing housing units are factored into existing fire protection facility service ratios and because the Project would not result in the construction of new units, the Project would have no impact on the service ratios of fire protection facilities serving residential needs.

Construction, operation and maintenance, and decommissioning would not affect the ability of the SBCFD to respond to incidents at the Project site within the target response times described in Section 3.17.2.5 because the Project site would be accessible via I-15, where speed limits would allow fire engines to travel to the site quickly from Baker. Additionally, the SBCFD would likely be able to respond to incidents with four to six or more personnel because there are at least three full-time firefighters are employed at the station in Baker and other PCFs are available in the area. Therefore, the Proposed Action would not result in the need for new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives. No impact would occur.

Additionally, fire prevention and protection measures described in Chapter 2, *Proposed Action and Alternatives*, and Section 3.8, *Hazards and Hazardous Materials*, would reduce the level of potential demand for local fire protection services. As described in Section 3.20, *Wildland Fire Ecology*, Mitigation Measure 3.20-1 requires the Applicant to prepare and implement a Fire Safety Plan that would decrease the risk of fires and include fire response measures that

employees would implement before emergency responders arrive on-site. Impacts related to on-site fire risks and emergency response are described in Section 3.20. No impact would occur.

Because the Project would cause no impact resulting from the construction or alteration of fire protection facilities, it could not cause or contribute to any significant cumulative impact in this respect.

h.ii) The Proposed Action would not require the construction of new or physical alteration of existing police protection facilities. (No Impact)

Although it is anticipated that all temporary construction-related positions would be filled from the local labor pool, some temporary workers could move into the service area of the SBCSCD from elsewhere. If so, the SBCSCD's current staff could accommodate the potential minor increase in population while maintaining acceptable service ratios, and as a result the Proposed Action's workforce would have no impact on the service ratios of police protection facilities serving residential needs. Because the operation and maintenance phase would have a substantially smaller workforce, the effects of this workforce on police protection services would be reduced compared to the construction and decommissioning phases.

During the construction, operation and maintenance, and decommissioning phases, incidents requiring law enforcement response could occur (e.g., vandalism or theft of Project components or employee property). Depending on the nature of the incident, the SBCSCD, California Highway Patrol, and/or BLM Rangers could respond. Because the Project site is not located near populated areas and would be surrounded by security fencing as described in Section 2.4.2.4, incidents are expected to be infrequent, and are not anticipated to require a level of law enforcement response that would necessitate the construction of new or physical alteration of existing police protection facilities.

Therefore, construction, operation and maintenance, and decommissioning would not result in the need for new or physically altered police protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives. No impact would occur.

Because the Project would cause no impact resulting from the construction or alteration of police protection facilities, it could not cause or contribute to any significant cumulative impact in this respect.

h.iii) The Proposed Action would not require the construction of new or physical alteration of existing schools. (No Impact)

Although it is not anticipated that temporary workers would bring school-aged children into the BVUSD or BUSD service area, the up to 30-month construction period could be long enough that some would bring children. The number of school-aged children that reasonably could be generated by these workers would not likely exceed the physical capacity of BVUSD or BUSD facilities.

Because the operation and maintenance phase would have a smaller workforce, the potential for school-aged children resulting from the Proposed Action would be reduced compared to the construction and decommissioning phases. Therefore, construction, operation and maintenance, and decommissioning would not result in the need for new or physically altered school facilities. No impact would occur.

Because the Project would cause no impact resulting from the construction or alteration of schools, it could not cause or contribute to any significant cumulative impact in this respect.

h.v) The Proposed Action would not require the construction of new or physical alteration of existing public facilities. (No Impact)

The Proposed Action would not result in substantial adverse impacts related to other types of public facilities (e.g., public libraries, hospitals, or other civic uses) because, as discussed above, it would not result in a significant increase of local population or housing, which is typically associated with increased demand for public facilities. Therefore, the Proposed Action would not have an effect on the service goals of other public services and would have a no impact associated with the provision of new or physically altered facilities for libraries, hospitals, or other civic uses. No impact would occur.

Because the Project would cause no impact resulting from the construction or alteration of other public facilities, it could not cause or contribute to any significant cumulative impact in this respect.

3.17.6.2 Alternative B

Construction, operation, maintenance, and decommissioning of Alternative B would cause the same types of impacts related to utilities and service systems as the Proposed Action. The size of this alternative would be reduced compared to the Proposed Action. Consequently, water consumption and solid waste generation associated with this alternative would be reduced. Nonetheless, there would be no substantial difference between Alternative B and the Proposed Action. Therefore, like the Proposed Action, Alternative B would cause no impact with respect to wastewater treatment requirements, water and wastewater treatment facilities, wastewater treatment capacity, or solid waste regulations. This alternative would have a less than significant impact with respect to water supply entitlements and resources and landfill capacity. Similar to the Proposed Action, implementation of Mitigation Measures 3.19-2 and 3.19-4 would reduce impacts regarding storm water drainage facilities to less than significant.

Construction, operation, maintenance, and decommissioning of Alternative B would cause the same types of impacts related to public services as the Proposed Action. The construction and decommissioning workforces are anticipated to be smaller than the Proposed Action due to the reduced size of the solar arrays; therefore, these phases would result in reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Construction and decommissioning workforces for this alternative also

would be on-site for shorter periods of time than for the Proposed Action. Consequently, these temporary increases in population would occur for shorter periods of time.

The permanent operational and maintenance workforce is anticipated to be smaller than the Proposed Action. Therefore, Alternative B would result in slightly reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Nonetheless, there would be no substantial difference between this alternative and the Proposed Action.

Because each phase of this Alternative likely would result in a reduced on-site workforce, the significance of potential impacts of this alternative would be the same as for the Proposed Action (no impact).

3.17.6.3 Alternative C

Construction, operation, maintenance, and decommissioning of Alternative C would cause the same types of impacts related to utilities and service systems as the Proposed Action. The size of this alternative would be reduced compared to the Proposed Action. Consequently, water consumption and solid waste generation associated with construction, operation, maintenance, and decommissioning of this alternative would be reduced. Nonetheless, there would be no substantial difference between Alternative C and the Proposed Action. Therefore, like the Proposed Action, Alternative C would cause no impact with respect to wastewater treatment requirements, water and wastewater treatment facilities, wastewater treatment capacity, or solid waste regulations. This alternative would have a less than significant impact with respect to water supply entitlements and resources and landfill capacity. Similar to the Proposed Action, implementation of Mitigation Measures 3.19-2 and 3.19-4 would reduce impacts regarding storm water drainage facilities to less than significant.

Construction, operation, maintenance, and decommissioning of Alternative C would cause the same types of impacts related to public services as the Proposed Action. The construction and decommissioning workforces are anticipated to be smaller than the Proposed Action due to the reduced size of the solar arrays; therefore, these phases would result in reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Construction and decommissioning workforces for this alternative also would be on-site for shorter periods of time than for the Proposed Action. Consequently, these temporary increases in population would occur for shorter periods of time.

The permanent operational and maintenance workforce is anticipated to be smaller than for the Proposed Action. Therefore, Alternative C would result in slightly reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Nonetheless, there would be no substantial difference between this alternative and the Proposed Action.

Because each phase of this Alternative likely would result in a reduced on-site workforce, the significance of potential impacts of this alternative would be the same as for the Proposed Action (no impact).

3.17.6.4 Alternative D

Construction, operation, maintenance, and decommissioning of Alternative D would cause the same types of impacts related to utilities and service systems as the Proposed Action. The size of this alternative would be reduced compared to the Proposed Action. Consequently, water consumption and solid waste generation associated with construction, operation, maintenance, and decommissioning of this alternative would be reduced. Nonetheless, there would be no substantial difference between Alternative D and the Proposed Action. Therefore, like the Proposed Action, Alternative D would cause no impact with respect to wastewater treatment requirements, water and wastewater treatment facilities, wastewater treatment capacity, or solid waste regulations. This alternative would have a less-than-significant impact with respect to water supply entitlements and resources and landfill capacity. Similar to the Proposed Action, implementation of Mitigation Measures 3.19-2 and 3.19-4 would reduce impacts regarding stormwater drainage facilities to less than significant.

Construction, operation, maintenance, and decommissioning of Alternative D would cause the same types of impacts related to public services as the Proposed Action. The construction and decommissioning workforces are anticipated to be smaller than the Proposed Action due to the reduced size of the solar arrays; therefore, these phases would result in reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Construction and decommissioning workforces for this alternative also would be on-site for shorter periods of time than for the Proposed Action. Consequently, these temporary increases in population would occur for shorter periods of time.

The permanent operational and maintenance workforce is anticipated to be smaller than the Proposed Action. Therefore, Alternative D would result in slightly reduced effects on the ability of public service providers to maintain acceptable service ratios, response times, and other performance measures. Nonetheless, there would be no substantial difference between this alternative and the Proposed Action.

Because each phase of this Alternative likely would result in a reduced on-site workforce, the significance of potential impacts of this alternative would be the same as for the Proposed Action (no impact).

3.17.6.5 Alternative E: No Action/No Project

If Alternative E were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, the No Action/No Project Alternative would result in no changes to conditions related to public services and utilities; no impact would result.

3.17.6.6 Alternative F: CEQA No Project

Alternative F would generally cause the same types of public services and utilities-related impacts as the Proposed Action during construction, operation and maintenance, and decommissioning. However, under this alternative, water would not be obtained from on-site wells. Instead, water would be acquired from an off-site source and delivered by truck. Although the specific potential water supplier has not been indicated by the Applicant, the Applicant has indicated that water would come from nearby Baker. The only bulk water supplier in Baker is the BCSD. Groundwater in the area surrounding Baker is not adjudicated. Therefore, it is anticipated that purchase of water from an off-site vendor would not result in the need for new or expanded water entitlements to serve the demands of the Project, and no impact would result with respect to water supply entitlements.

3.17.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

If Alternative G were implemented, no Project-specific changes would be implemented on the site and the existing environmental setting would be maintained. As a no-development alternative, Alternative G would result in no changes to conditions related to public services and utilities; no impact would result.

References

Baker Community Services District (BCSD), 2013. Baker Community Services Service Price List. [http://www.bakercsd.com/linked/price%20list%20effective%201-1-13.pdf]

Barstow Unified School District, 2013. [www.barstow.k12.ca.us/index.cfm?fuseaction=menu&menu_id=1] Accessed July 5, 2013.

BLM, 2010. California Desert Conservation Area Plan Amendment / Final Environmental Impact Statement for the Ivanpah Solar Electric Generating System. July. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.19048.File.dat/1-CDCA-Ivanpah-Final-EIS.pdf]

BLM, 2012. Stateline Solar Farm Project Draft Environmental Impact Statement/ Environmental Impact Report. November. [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.47817.File.dat/Stateline%20Solar%20Farm%20Draft%20EIS-EIR%20-%20Nov%202012_508.pdf]

BLM and San Bernardino County, 2012.

California Department of Education, 2012. Enrollment by Grade for 2011-12, Baker Valley Unified School District. Educational Demographics Unit. [http://dq.cde.ca.gov/dataquest/] Report generated December 19, 2012.

California Department of Resources Recycling and Recovery (CalRecycle), 2012a. Facility/Site Summary, Barstow Sanitary Landfill (36-AA-0046). [www.calrecycle.ca.gov] Accessed December 19, 2012.

CalRecycle, 2012b. Jurisdiction Diversion/Disposal Rate, San Bernardino County, Unincorporated, 2011. [http://www.calrecycle.ca.gov/LGCentral/Reports/DiversionProgram/JurisdictionDiversionDetail.aspx?JurisdictionID=428&Year=2011] Accessed December 26, 2012.

CalRecycle, 2013. Construction/Demolition and Inert Debris Tools and Resources Calculations. [http://www.calrecycle.ca.gov/swfacilities/CDI/Tools/Calculations.htm] Accessed July 8, 2013.

Federal Railroad Administration (FRA), 2011. Final Environmental Impact Statement and Final Section 4(f) Evaluation for the Proposed DesertXpress High-speed Passenger Train Victorville, California to Las Vegas, Nevada. March. [http://www.fra.dot.gov/Page/P0401]

National Fire Protection Association, 2010a. NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2010 Edition. [http://www.nfpa.org/itemDetail.asp?categoryID=999&itemID=24346&URL=Codes%20&%20Standards/Code%20development%20process/] Accessed August 16, 2013.

National Fire Protection Association, 2010b. NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, 2010 Edition. [http://www.nfpa.org/itemDetail.asp?categoryID=999&itemID=24347&URL=Codes%20&%20Standards/Code%20development%20process/] Accessed August 16, 2013.

RMT, 2011a. Preliminary Hydrology Study Report (Revised), Soda Mountain Solar Project, March 1, 2011.

RMT, 2011b. Hydrogeological Conditions and Groundwater Modeling Report, Soda Mountain Solar Project, March 1, 2011.

San Bernardino County, 2007. County of San Bernardino 2007 General Plan, as amended.

San Bernardino County, 2012. Countywide Integrated Waste Management Plan, Five-Year Review Report, November 1997, Revised November 2012.

San Bernardino County, 2013. Construction Waste Management Plans, [www.sbcounty.gov/dpw/solidwaste/ConstrWasteMgmt.asp] Accessed July 9, 2013.

San Bernardino County Fire Department (SBCFD), 2012a. [www.sbcfire.org] Accessed December 19, 2012.

SBCFD, 2012b. San Bernardino County Fire Department Annual Report, July 2011-June 2012.

San Bernardino County Sheriff-Coroner Department (SBCSCD), 2011. San Bernardino County Sheriff's Department Annual Report, 2011. [http://www.sbcounty.gov/sheriff/annualreports/2011/2011%20Annual%20Report.pdf]

SBCSCD, 2012. About Us. [www.sbcounty.gov/sheriff] Accessed December 18 and 19, 2012.

San Bernardino County Solid Waste Management Division (SBCSWMD), 2012. Solid Waste Management. [http://www.sbcounty.gov/dpw/solidwaste/default.asp] Accessed December 18, 2012.

TRC Solutions, 2013. Hydrogeological Conditions and Groundwater Modeling Report Addendum, Soda Mountain Solar Project, May 2013.

U.S. Department of Energy (DOE), 2011. Final Environmental Assessment for Department of Energy Loan Guarantee to Mojave Solar, LLC for the Abengoa Mojave Solar Project near Barstow, California. July. [http://lpo.energy.gov/wp-content/uploads/2010/10/Abengoa-Mojave-Final-EA.pdf]

This page intentionally left blank

3.18 Visual Resources

3.18.1 Introduction

This section introduces the regulatory framework, the affected environment, and the impact assessment of the Proposed Action and alternatives on visual resources. The BLM manages the public lands for their scenic values through its authorities under FLPMA that include the regulation of use, occupancy, and development of public lands. FLPMA requires the BLM to consider and manage scenic values in balance with multiple resources. Scenic values are to be managed in a manner that best meets the present and future needs of the American public while preventing unnecessary or undue degradation. Following is a description of the visual resource assessment that was conducted based on the Proposed Action. The visual resource assessment will result in a determination of plan conformance, the identification of direct and indirect effects, and the recommendation of mitigation measures.

3.18.2 Regional and Local Environmental Setting

The Project site is located in the southern end of the Basin and Range physiographic region in the western Mojave Desert within San Bernardino County, California.[1] The study area is defined as all land areas from which any element of the Project would be visible, i.e., the Project's viewshed. The Project site straddles I-15 within a broad perched valley surrounded by the Soda Mountains. The landscape character consists primarily of gently sloping, large alluvial fans emanating into the valley, which are bisected by I-15, two transmission lines, and an underground gas pipeline. The existing transmission lines run parallel along the northwest side of I-15. The transmission line further from the highway and less noticeable is the 500 kV LADWP transmission line, while a SCE 115 kV line is located closer to the highway. The most prominent features of the transmission lines due to the distance and material are the dark, wooden vertical single utility poles. The Project site's topography is characterized by smoothly undulating and relatively flat alluvial fan surface to incised young and active drainages cut into the elevated older alluvial fan surfaces (Wilson Geosciences, 2011). As described in Section 3.3, *Biological Resources – Vegetation*, creosote desert scrub covers the majority of the surface floor, with soil exposed along occasional and random exposed roads and washes. The valley is visually contained by the Soda Mountains. Along I-15, the valley is bounded by the Rasor Road interchange to the west and the Zzyzx Road interchange to the east. To the west of the I-15/Rasor Road interchange, and approximately 400 feet below it in elevation, is the Cronese Valley. Soda Lake and the town of Baker are located to the east of the I-15/Zzyzx Road interchange and approximately 300 feet below it in elevation. Due to these elevation changes, in addition to the ridgelines of the Soda Mountains, Cronese Valley, Soda Lake, and Baker are visually disconnected from the site.

[1] California's geomorphic provinces and the physiographic regions of the U.S. are naturally defined geologic regions that display a distinct landscape or landform. These divisions are based on unique, defining features such as geology, topographic relief, climate, and vegetation. The distinction between California's geomorphic provinces and the physiographic regions of the U.S. is in the scale at which they are defined.

The Mojave National Preserve (NPS) is located east of the Project site. The Mojave National Preserve was established in 1994 with the passage of the California Desert Protection Act and was previously the East Mojave National Scenic Area. The Preserve protects 1.6 million acres of diverse desert habitat. The landscape contains a variety of habitats including cactus gardens, native desert grasslands, pinyon-juniper forest, and ancient white fir forest. The Mojave National Preserve's mission is to "preserve, protect, and promote the unique natural beauty, ecological integrity, and rich cultural history of Mojave National Preserve." A portion of the Preserve boundary is immediately southeast of the Project site and is visible in the foreground/ middleground distance zone. The Mojave National Preserve lands are adjacent to I-15 and portions of the Soda Mountains ridgelines along the western boundary of the Preserve.

The visual character of the landscape within the region has substantial variability based on the location of the viewer and other variables, such as seasonal climate, atmospheric and lighting conditions, cultural modifications, and the visibility, presence, and extent of character-defining visual features. The visual character of the Project site can be broadly generalized within two primary contexts: the natural landscape and the built environment (i.e., areas where cultural modifications dominate, or nearly dominate the visual character of an area).

3.18.2.1 Natural Landscape

Context photographs of the natural landscape of the Soda Mountain Valley are provided in Figures 3.18-1 and 3.18-2 from different vantage points. Generally, the landscape can be characterized as a broadly enclosed valley that is unencumbered by intervening features. From low angles of view, foreground and middleground views are greatly shortened/diminished, forming a continuous horizon line that distinctly separates the valley floor from background views of the foothills and mountains, although the prominence of the line can be blurred by distance, atmospheric haze, and/or interrupted by intervening desert scrub. In this visual context, viewers are drawn to background views of the mountains, which stand in sharp contrast to the landscape character elements of form, color, and texture of the valley floor. Landscapes such as these are unencumbered and wide in scale, and accurate perceptions of distance are difficult to determine. The primary travel route through the site, I-15, generally provides viewers low-angle perspectives of the valley, and viewer attention is most typically drawn to the Soda Mountain range.

As viewers in the landscape gain elevation, the shape, texture and colors of the valley floor begin to attract greater attention as it occupies a greater portion of the view. In elevated locations with close-range views of adjacent mountains, the landscape begins to take on a focal character, as the jagged, pyramidal outlines of the mountains and the converging desert washes draws viewer attention toward the middle of the scene. In views toward the valley for travelers driving south along I-15 from Zzyzx Road, the distance and scale of the valley floor become increasingly apparent as the highway curves around adjacent mountains in the foreground distance, and distant mountain ranges lose some degree of dominance in the scene, especially in circumstances of haze or cloudiness. There are also intermediate to high-angle views from Blue Bell Mine Road. Within the valley of the Soda Mountains, Cronese Valley, and surrounding mountain ranges, high-angle views are accessible on foot in a few locations and intermediate-angle views are experienced as

the proposed North Array comes into view when traveling south along I-15. See Figure 2-1 for the proposed array locations. However, the majority of views when traveling along I-15 are low-angle.

3.18.2.2 Built Environment

The built environment's effect on the visual character of the landscape includes numerous foreground and middleground elements that stand in visual contrast to the natural character of the surrounding environment. The greatest degree of development in the valley are two transmission lines, an electrical distribution line, and associated vertical structures that parallel the northwest side of I-15 in an organized pattern. There are also unpaved roads in the valley, which are low-lying and not immediately discernible to viewers, especially those travelling along I-15. I-15 in itself is a large cultural modification to the landscape as a large linear paved feature with traveling vehicles. It is a divided highway with a total of four lanes separated by an unvegetated median, approximately 100 feet in width. The speed limit is 70 mph within the valley. Associated structures include bridges, fences, reflectors and signs, and an overpass at the Rasor Road interchange. There is also an overpass at the Zzyzx Road interchange, but it is not visible from the Project site, nor is the Project site visible from this location. A gas station and convenience store with associated signs, parked vehicles, and other scattered buildings is located on the southeast side of I-15 at the Rasor Road interchange.

3.18.2.3 Project Viewshed and Key Observation Points

The Project viewshed (shown in Figure 3.18-3) was developed using computer-generated viewshed tools, based on numerous points that model the location and height of the proposed solar plant site, and a 10-meter resolution (horizontal) USGS digital elevation model. In addition to estimating the extent and angle of visibility, the viewshed calculation is useful in determining which existing roadways and other publicly accessible vantage points are located within the viewshed of the Project. A Key Observation Point (KOP) is defined by the BLM as one or a series of points on a travel route or at a use area or a potential use area, where the view of a management activity would be most revealing. Based on the study area, the location of public roadways, BLM facilities, and other public vantage points, the BLM and NPS selected 13 KOPs for evaluation as described below in Section 3.18.4.2. The purpose of the KOPs is to capture representative views of the Project site, to be used in visual simulations of the Project, and as an aid in preparing visual contrast ratings of the Project. An interdisciplinary team from BLM and NPS discussed and considered 29 KOPs (September 11, 2012). The BLM Barstow Field Office determined that 16 KOPs should be further considered. Of these 16 KOPs, three locations were determined to not have a view of the Project site due to topography and distance. Therefore, 13 KOPs were selected. Four of the KOPs are along I-15. Six of the KOPs are on BLM lands. Three of the KOPs are on NPS lands within the Mojave National Preserve.

BLM guidelines for the selection of the KOPs stress commonly traveled routes or other observation points and are found in Handbook H-8431-Visual Resource Contrast Rating (BLM, 1986b). However, during the scoping process for this PA/EIS/EIR, several commenters, including the NPS, expressed concern about the visual impact that would occur as a result of the Project and

called for visual resource studies to identify the Project's impact to surrounding landscapes and scenic vistas. The NPS also expressed concern about the effect that lighting would have on the visual landscape surrounding the Project area. To facilitate general goals of the Viewshed/Visual Quality section of the Mojave National Preserve General Management Plan, three points within the Mojave National Preserve that are not located along commonly traveled routes were selected upon request of the NPS (KOPs 13, 14, and 19).

General considerations about the remainder of selected KOPs emphasized views from publicly accessible locations, including I-15 and designated travel routes, and:

1. Scenic overlooks, important vantage points
2. Historic destinations
3. Initial views to the proposed project area
4. Angle of observation
5. Number of viewers
6. Length of time the project is in view
7. Relative project size
8. Season of use
9. Light conditions

The locations of the KOPs are shown in Figure 3.18-5 and the visual characteristics of each viewpoint and the Project-related visual contrast are fully detailed in this section.

3.18.2.4 Regulatory Framework

The BLM's VRM Policy implements the requirements of FLPMA and other sources for managing scenic resources. Pursuant to FLPMA, the BLM has developed and applied a standard visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. BLM Manual M-8400-Visual Resource Management (BLM, 1984), Handbook H-8410-Visual Resource Inventory (BLM, 1986a), and Handbook H-8431-Visual Resource Contrast Rating (BLM, 1986b) set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance to the established objectives for BLM-administered public lands. The following describes the three primary elements of the BLM's VRM Policy.

Visual Resource Inventory

The Visual Resource Inventory (VRI) is the agency's official record of the existing status and condition of visual resources on BLM-administered lands and they are conducted according to guidance in BLM Handbook H-8410. There are three factors inventoried: scenic quality, public sensitivity, and distance zones. Each of these factors is mapped into rating units that are evaluated and scored then combined following a matrix to determine the VRI Class (H-8410-1, Illustration 11). There are four VRI classes (I through IV). VRI Classes II through IV are derived by the method previously mentioned and represent a summary understanding of visual values. VRI Class II represents the highest combination of factor scores obtained from inventory and VRI Class IV represents the lowest combination of factor scores. VRI Class I is an exception being that it is assigned to areas based on a management decision and not on inventory scores. VRI Class I is assigned to areas where a management decision has been made previously to maintain a natural landscape such as national Wilderness Areas or "wild" sections of Wild and Scenic

Rivers. VRI classes are informational in nature and provide the basis for considering visual values in the resource management planning process. They do not establish management direction. Following are descriptions of the three inventory factors:

Scenic Quality: Scenic Quality Rating Units (SQRUs) are delineated based on common characteristics of the landscape. There are seven criteria used for inventorying the landscape's scenic quality within each SQRU: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and degree of cultural modification. Each factor is scored for its respective contribution to the scenic quality, the scores are summed, and the unit is given a rating of A (highest), B, or C (lowest) based on the final score.

Sensitivity Level: Sensitivity Level Rating Units (SLRU) are delineated and evaluated for public sensitivity to landscape change. Criteria used for determining level of sensitivity within each unit includes types of use, amount of use, public interest, adjacent land uses, special areas, and other factors. Each criterion is ranked high, medium, or low and an overall sensitivity level rating then is assigned to the unit.

Distance Zones (visibility): The third factor is visibility of the landscape evaluated from where people commonly view the landscape. The distance zones are divided into foreground/middleground (3 to 5 miles); background (5 to 15 miles); and seldom seen (beyond 15 miles or topographically concealed areas within the closer range distance zones).

Establishing Management Objectives

Visual Resource Management (VRM) classes (defined in Table 3.18-1) are determined by considering both VRI class designations (visual values) along with applicable resource allocations, demands, and, management decisions. Management objectives for each VRM class set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The allowable levels of visual change for VRM Classes I through IV are decreasingly restrictive. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape.

TABLE 3.18-1
VISUAL RESOURCE MANAGEMENT CLASSES

VRM Class	Objective
Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The VRM classes are land use plan decisions that guides future land management actions and subsequent site-specific implementation actions. The VRM class designations are to be assigned to all BLM public land. The VRM class designations may be different than the VRI classes assigned in the inventory and should reflect a balance between protection of visual values while meeting energy and other land use or commodity needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction, or its designation as a utility corridor.

While the applicable resource management plan for the study area is the CDCA Plan, it does not contain a visual resource element, and has not established VRM classes. For a description of the CDCA Plan as it relates to visual resources, see Section 3.18.2.1. When a project is proposed and there are no resource management plan-approved VRM objectives, interim VRM classes must be established for the purpose of establishing a baseline for analysis. These classes are developed using the process just described, but may be restricted in geographic scope to areas affected by the proposed action.

Evaluating Proposed Actions

Proposed implementation actions are evaluated for conformance to the VRM class objectives through the use of the Visual Resource Contrast Rating process set forth within BLM Handbook H-8431-1.

3.18.2.5 Visual Resource Inventory of the Project Area

A current VRI exists covering all of the BLM-administered lands within the Barstow Field Office including the area of the Proposed Action (BLM, 2010a). Following is information about each inventory factor.

Scenic Quality Ratings

Scenic quality is a measure of the visual appeal of a tract of land. In the VRI process, public lands are given an A, B, or C rating based on the apparent scenic quality which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. During the rating process, each of these factors is ranked on a comparative basis with similar features within the physiographic province. A Scenic Quality Rating Unit (SQRU) is a planning area that has been delineated on a basis of similar physiographic characteristics: similar visual patterns, texture, color, variety, etc., and areas which have similar impacts from cultural modifications. The size of SQRUs may vary from several thousand acres to 100 or fewer acres, depending on the homogeneity of the landscape features and the detail desired in the inventory. According to the Barstow Field Office VRI, one SQRU covers the Project area. The rating was determined based on four Inventory Observation Points (IOPs 34, 35, 36, and 37). For the entire unit, the inventory and mapping identified a Scenic Quality Rating of B-Medium (BLM, 2010a).

SQRU No. 12 – Avawatz Mountains

4. SCORE			Scenic Quality Classification (check one)
	Rating	**Explanation or Rationale**	☐ A – 19 or more
a. Landform	3.5	Mountain	
b. Vegetation	3	Pine at upper elevations	☒ B – 12 - 18
c. Water	0	Not visible	
d. Color	1.5	Soil and vegetation contrast	☐ C – 11 or less
e. Adjacent Scenery	3	Panoramic valley and mountains	
f. Scarcity	2	Common	☐ Rehab
g. Cultural Modification	-0.5	Power line	☐ Special Area
Total	12.5		

SOURCE: BLM, 2010a

Description: Its form is characterized by large, rugged mountains with pyramidal peaks and complex features. Its sparse vegetation is low in form, and monotone grey in color. Existing structures include roads and power lines. (BLM, 2010a)

Visual Sensitivity

Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern: type of users, amount of use, public interest, adjacent land uses, special areas (i.e., Wilderness Areas, Wild and Scenic Rivers, Scenic Roads or Trails, Areas of Critical Environmental Concern). Sensitivity Level Rating Units (SLRUs) are delineated on a case-by-case basis; there is no standard procedure. The boundaries are based on the factor that is driving the sensitivity consideration. The VRI assigned a sensitivity level of medium to the Project area (SRLU No. 54 – Rasor). This rating was based on relatively low levels of recreation use (primarily OHV users). (BLM, 2010a)

SLRU No 54 – Rasor

	H/M/L	**Explanation of Rating**
Type of Use	H	History buffs, organized groups
Amount of Use	M	Not highly used as a historic route retracing
Public Interest	H	Increasing interest
Adjacent Land Uses	L	OHV area
Special Area Sensitivity	M	Traveled for a scenic western experience
Other Factors	NP	Not present
Overall Rating	M	Within an OHV area

SOURCE: BLM, 2010a

Description: OHV area with moderate use from history buffs and organized groups; follows a split route of the Old Spanish Trail. (BLM, 2010a)

Distance Zones

According to the VRI (BLM, 2010a, Map 4-1), all portions of the Project site are within the foreground/middleground zone because I-15 and other public routes of travel are located within a distance of 5 miles.

Visual Resource Inventory Classes

Based on the scenic quality, visual sensitivity, and distance zone described above, and on the VRI classification matrix in Table 3.18-1, all portions of the Project site are rated as VRI Class III. This indicates the lands affected by the Project have a moderate visual value. The VRI class boundaries are shown in relation to the Project area in Figure 3.18-4.

3.18.2.6 Interim Visual Resource Management Class Recommendations

As discussed above, there are currently no VRM Classes established for lands under BLM jurisdiction within the CDCA Plan area. The designation and adoption of Interim VRM Classes conducted in support of a specific project is a BLM Field Office Manager decision. On September 30, 2013, the Barstow Field Office determined that the interim VRM Class for the Project area is Class III. The cultural modifications within the landscape preclude a VRM Class II landscape and VRM Class IV does not apply as the Project setting is mostly undisturbed with its natural beauty and harmony dominating the views.

3.18.3 Applicable Laws, Regulations, Plans, and Standards

3.18.3.1 Federal

California Desert Conservation Area Plan

Under FLPMA Section 601, the BLM has developed the CDCA Plan to “provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality.” Central to the CDCA Plan is the establishment of Multiple Use Classes that govern the management of the public lands based on the sensitivity of the resources and types of uses for each geographic area. As discussed in greater detail in Section 3.9, *Lands and Realty*, multiple use classes are divided into four categories, each of which have specific guidelines for the management of specific resource or activity areas contained and discussed in each of the CDCA Plan elements.

Section 2.4.1 describes the land use designations of the Project site, which is within the BLM’s California Desert District and within the planning boundaries of the CDCA Plan. The CDCA Plan does not include a stand-alone visual resource plan element; however, visual values are addressed

in the CDCA Plan's recreation element. According to the recreation element, the BLM will take the following actions to effectively manage for activities involving the alteration of the natural character of the landscape (BLM, 1999):

1. The appropriate levels of management, protection, and rehabilitation on all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple use class guidelines.

2. Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using the BLM's contrast rating process.

Federal Land Policy and Management Act

The FLPMA requires that the public lands be managed in a manner that will protect the quality of scenic values (43 USC §1701(a)(8)). In order to meet its responsibility to maintain the scenic values of public lands, BLM developed the VRM system. BLM's VRM policy is set forth in Manual 8400 (BLM, 1984), with guidance provided in Manual H-8410-1 Visual Resource Inventory (BLM, 1986a), and H-8431 Visual Resource Contrast Rating (BLM, 1986b). Additional guidance is contained in BLM Washington Office Instruction Memorandum 2009-167, Application of the Visual Resource Management Program to Renewable Energy.

FLPMA requires coordination with local planning (Title II, §202 (b)(9)). Although all Project lands are in public ownership, the BLM is coordinating with San Bernardino County in the preparation of this PA/EIS/EIR.

Mojave National Preserve General Management Plan

The General Management Plan for the Mojave National Preserve catalogs general goals and policies for Preserve management, including the protection of scenic resources (NPS, 2002). To date, the NPS has not adopted specific guidelines related to preservation of visual resources or evaluating impacts of projects within or near the Preserve. The General Management Plan states that NPS will, at a future date, prepare more specific guidelines to establish visual consistency and themes in facility development. Guidelines will also be created for reaching visual compatibility with surrounding landscapes, significant architectural features, and site details. The primary objective of these guidelines will be to create harmony between the built environment and the natural environment.

The following management direction is provided in the General Management Plan that affects visual resources (NPS, 2002):

Viewsheds / Visual Quality:

1. Encourage compatible adjacent land uses and seek to mitigate potential adverse effects on park values by actively participating in planning and regulatory processes of neighboring jurisdictions, other federal, state, and local agencies, and Native Americans.

2. Prepare guidelines for the built environment to establish visual consistency and themes in facility development and to create harmony between the built environment and the natural environment.

3. Prepare a communication management plan to address the NPS goals and the need to establish sites for communication equipment.

Night Sky: The NPS will partner with communities and local government agencies to minimize reflected light and artificial light intrusion on the dark night sky, recognizing the essential component that a carpet of stars against a black night sky is for a natural outdoor experience. The NPS will strive to set the best example in all developments that involve the use of artificial outdoor lighting, ensuring that such lighting is limited to basic safety requirements and shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. Baseline light measurements will be established to monitor changes over time.

There are two General Management Plan land use designations within the Preserve from which the Project site may be seen. As described in the General Management Plan (NPS, 2002), these designations and their desired characteristics are:

Natural Areas: Natural areas of the Preserve that occur outside of designated wilderness provide an informal, self-guided desert learning experience for visitors. People are encouraged to get out of their vehicles and walk to features. The pace is slow with low to moderate levels of noise. Visitors typically focus on specific resources with few visual intrusions. Visitors experience a sense of learning through onsite interpretation or other means. The length of stay at each site is relatively short in comparison to the time visitors spend in the preserve. There is a moderate amount of social crowding and moderate interaction at points of interest and along dead-end trails. Guided ranger walks are occasionally provided for visitors at some locations. Development is limited to items such as low interpretive panels, small directional signs, and hardened dirt paths. Fences are used as a last resort to protect resources if other management efforts do not work. The tolerance for resource degradation is low to moderate, depending on the sensitivity of the resource. The degree of on-site visitor and resource management is moderate and increases or decreases with visitation levels.

Wilderness: Wilderness, as a desired future condition, is a subset of the natural environment, where protection of the natural values and resources is the primary management goal. Restrictions on use of these areas are imposed by law and policy in order to provide a primitive environment free from modern mechanization and motorized travel. The landscape offers a high degree of challenge and adventure for visitors. The visual quality of the landscape contributes significantly to the visitor experience and needs to be protected. The tolerance for resource degradation is low, with the exception of designated trail corridors, where a slightly higher level of degradation is allowed within a few feet of the trail and at points where camping occurs. A minimal amount of resource and visitor management is present.

The General Management Plan also addresses scenery-related effects of external development on adjacent lands. In part, the plan provides the following direction:

To fulfill the mandate to preserve park resources unimpaired for future generations, adopting strategies and actions beyond park boundaries has become increasingly necessary. Because ecological processes cross park boundaries, and parks typically do not incorporate

the entire ecosystem or scenic vista, many activities proposed or existing on adjacent lands have the potential to significantly affect park resources, programs, visitor experiences and wilderness values.

Recognizing these issues, the park staff will work cooperatively with others to anticipate, avoid, and resolve potential conflicts and to address mutual interests in the quality of life for community residents.

Old Spanish National Historic Trail

The Old Spanish National Historic Trail links Santa Fe and Los Angeles across six states and 2,700 miles. The Old Spanish Trail was designated by Congress as a National Historic Trail in December 2002 (Public Law 107–325). By memorandum from the Secretary of the Interior, the Old Spanish National Historic Trail is jointly administered by BLM and NPS, working in partnership with other federal, state, and local government agencies, as well as private landowners who manage or own lands along the trail route (BLM, 2013a). The Armijo Route of the Old Spanish Trail route follows the Mojave River into the Mojave National Preserve, then travels on the east side of the Soda Mountains through Zzyzx to Baker (BLM, 2006).

3.18.3.2 State

California Scenic Highway System

California's Scenic Highway Program was created by the Legislature in 1963. Its purpose is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a State Scenic Highway.

I-15 through the Project area is identified by Caltrans as an Eligible State Scenic Highway. However, in order for a route to be designated as a State Scenic Highway, it must first be nominated for designation by the County. I-15 has not been nominated for designation by San Bernardino County for State Scenic Highway status.

3.18.3.3 Local

San Bernardino County General Plan

Although San Bernardino County is the largest county in the contiguous United States, the land use jurisdiction of the County is limited to private lands. Lands owned and controlled by BLM are outside the land use jurisdiction of the County Board of Supervisors and are referred to as

"non-jurisdictional" lands. Nevertheless, many of the issues identified in the San Bernardino County General Plan cover the entire County.

Open Space Element

The Open Space Element of the San Bernardino County General Plan includes goals and policies specific to the County's "Desert Region," in which the Project site is located, that directly address visual resources in the County. Those relevant to the Project include:

> ***Goal OS 4*:** The County will preserve and protect cultural resources throughout the County, including parks, areas of regional significance, and scenic, cultural and historic sites that contribute to a distinctive visual experience for visitors and quality of life for County residents.
>
> ***Goal OS 5*:** The County will maintain and enhance the visual character of scenic routes in the County.
>
> ***Policy OS 5.1:*** Features meeting the following criteria will be considered for designation as scenic resources:
>
> a. A roadway, vista point, or area that provides a vista of undisturbed natural areas.
>
> b. Includes a unique or unusual feature that comprises an important or dominant portion of the viewshed (the area within the field of view of the observer).
>
> c. Offers a distant vista that provides relief from less attractive views of nearby features (such as views of mountain backdrops from urban areas).
>
> ***Policy OS 5.2:*** Define the scenic corridor on either side of the designated route, measured from the outside edge of the right-of-way, trail, or path. Development along scenic corridors will be required to demonstrate through visual analysis that proposed improvements are compatible with the scenic qualities present.
>
> ***Policy OS 5.3:*** The County desires to retain the scenic character of visually important roadways throughout the County. A "scenic route" is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County.

I-15 through the Project area is a designated County scenic route. However, this designation does not mean the route has been nominated by the County as a State Scenic Highway and, in fact, the County has not nominated this segment of I-15 for State Scenic Highway status.

Conservation Element

The Conservation Element of the San Bernardino County General Plan addresses lighting as follows:

> ***Goal D/CO 3:*** Preserve the dark night sky as a natural resource in the Desert Region communities.
>
> ***Policy D/CO 3.1:*** Protect the night sky by providing information about and enforcing existing ordinances:

a. Provide information about the Night Sky Ordinance and lighting restrictions with each land use or building permit application.

b. Review exterior lighting as part of the design review process.

Policy D/CO 3.2: All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.

3.18.4 Analytical Methodology

There are two levels of analysis associated with the Proposed Action. The first tier is the disclosure of potential effects associated with the designation of the Interim VRM Class, which was determined by BLM Barstow Field Office staff with assistance from its environmental consultant. This is a general analysis and discussion based on the range of land uses allowed within the CDCA. The second tier of analysis relates to visual resource effects that could be created when the physical characteristics of the facilities associated with the Proposed Action or alternatives contrast with natural characteristics of the landscape setting. This analysis is used to determine the conformance or nonconformance of the Proposed Action or alternatives with the Interim VRM class objectives.

Contrast is measured by a systematic evaluation of the basic design elements of form, line, color, and texture, in accordance with the BLM's Handbook H-8431-1 Visual Resource Contrast Rating (BLM, 1986b). If the contrast rating reveals nonconformance of the Proposed Action or an alternative with Interim VRM class objectives, and mitigation measures are insufficient to bring it into compliance, then the design would need to be mitigated to the greatest extent possible, and to the VRM class objective at a minimum. If a project cannot be mitigated to meet the VRM class objectives, then the application may be denied or the proposal redesigned or relocated to meet the objective. The assessment of visual contrast is distinct from conclusions of *visual impact* presented in this section. A measure of visual impact includes potential human reactions to the visual contrasts arising from a development activity, based on number of viewers, viewer characteristics, including attitudes and values, expectations, and other characteristics that that are viewer- and situation-specific.

The analysis of contrast lends itself to identify specific design-oriented elements that are causing an issue with plan conformance and inversely, the opportunities to bring a non-conforming project into compliance with the VRM class. The contrast analysis may also be used to identify ways to protect against unnecessary and undue degradation of the visual resources and to reduce impacts that the proposal will cause to scenic values held by the public and stakeholders. The contrast rating system is not intended to be the only means of resolving impacts. It is used as a guide in the analysis, tempered by common sense, to ensure that every attempt is made to minimized potential visual impacts. The basic philosophy underlying the system is: The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. (BLM, 1986b)

The Proposed Action and alternatives are evaluated for conformance with the following VRM objectives consistent with the Interim VRM classification determined for the Project site:

> **VRM Class III:** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Since the overall VRM goal is to minimize visual impacts, mitigation measures are recommended for all adverse contrasts that could be reduced, even if the Proposed Action or alternatives meet VRM objectives. In addition to permanent visual contrast created in the landscape, the Project is analyzed for adverse effects of lighting and glare, as well as temporary construction disturbances.

3.18.4.1 Visual Contrast Rating Process

The degree to which the Project adversely affects the visual quality of a landscape relates directly to the amount of visual contrast between it and the existing landscape character. The degree of contrast is measured by separating the landscape into major features (land, water, vegetation, structures) then assessing the contrast introduced by the Project in terms of the basic design elements of form,[2] line,[3] color, and texture. The contrast of the Project with landscape elements then is rated as none, weak, moderate, or strong, as defined in Table 3.18-2. The purpose of this method is to reveal elements and features that cause the greatest visual impact, and to guide efforts to reduce the visual impact of a proposed action or activity. This process is described in detail in Handbook H-8431-1, Visual Resource Contrast Rating, and documented using BLM Form 8400-4.

TABLE 3.18-2
VISUAL CONTRAST RATINGS

Degree of Contrast	Criteria	Consistent with…
None	The element contrast is not visible or perceived.	VRM Class I - IV
Weak	The element contrast can be seen but does not attract attention.	VRM Class II - IV
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.	VRM Class III - IV
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.	VRM Class IV only

SOURCE: BLM, 1986b

[2] Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.

[3] Contrast in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their sub-elements (boldness, complexity, and orientation) from existing lines.

The criteria for visual contrast are aligned with the management objectives for each Interim VRM Class. For example, if a project results in a weak visual contrast, it is likely to be in conformance with Interim VRM Class II, whereas a project that results in a moderate contrast would likely be in conformance with VRM Class III objectives but would not conform to VRM Class II objectives.

3.18.4.2 Selection of Key Observation Points

The contrast rating is completed from the identified KOPs. The intent of establishing KOPs is to visualize the contrast created by the Proposed Action from locations most representative of how the public perceives the affected landscape. The "public" may include highway travelers, travelers on local roads, residents in surrounding interspersed private lands, OHV users, dispersed recreational users in surrounding wilderness areas, or users of BLM facilities. The sensitivity of these diverse user groups to changes in the landscape are influenced by a number of factors, including how prominent the view of the Proposed Action is (in terms of scale, distance and angle of observation), the frequency and duration that viewers are exposed to the view, and whether the viewer groups are aware of their surroundings or expectant of high-quality views.

Table 3.18-3 lists all 13 KOPs used in this analysis, describes their general locations, managing agency, disposition, and distance from the Project site, and provides an annotation as to the disposition. Four of the KOPs are along I-15. Five are on BLM land and three are on NPS lands within the Mojave National Preserve. The KOPs were selected to represent a mix of user types and viewer experiences. The visual contrast created by the Project is rated using simulations from each of these KOPs, and will be used to represent the visual change experienced from different locations and viewer types.

3.18.4.3 Visual Simulations

The purpose of preparing simulations is to provide a realistic visual portrayal that demonstrates the perceivable changes in landscape features caused by a proposed management activity as seen by the general public. Simulations are useful to assist in better understanding a project and to effectively evaluate the impacts of a proposed project as used in the VRM contrast rating process to show scale, relative placement of disturbing features, and other important information necessary to determine a VRM class objective. (2M Associates, 2013)

Five KOPs were selected for photo-simulations to best reflect the impacts and Project features as would most often be seen by the general public. Conditions that were specifically used to identify KOPs for photo-simulations completed by 2M Associates included:

1. Represent views from points along travel routes or managed use areas where project features most often seen by the general public would be most revealing. These include I-15 and Rasor Road leading to the Rasor OHV Recreation Area boundary.

2. Exemplify specific Project features. In particular, this involves all the solar array areas, the substation, berms that would manage the surface stormwater, the operation and maintenance facility, and the relocated Rasor Road as seen from each point where it would diverge from the existing road alignment and at the Rasor OHV Recreation Area boundary where an information kiosk would likely be located.

TABLE 3.18-3
KOP LOCATION AND CHARACTERISTICS

ID	Location	Managing Agency	Distance and Direction of View	Primary User Type	Comments
KOP 1	I-15	BLM Caltrans	0.2 miles Northeast	Motorists	Gateway view to Project area. Very high number of viewers. South array area in immediate foreground.
KOP 2	I-15	BLM Caltrans	1.2 miles West	Motorists	First view of North array area traveling south. Very high number of viewers.
KOP 4	I-15	BLM Caltrans	0.15 miles Northeast	Motorists	Two potential views looking on either side of I-15. Very high number of viewers. Specific considerations include view of proposed channel diversion berms (Marl Ditch) and proposed substation.
KOP 5	I-15	BLM Caltrans	0.25 miles Northwest	Motorists	Gateway view to Project area. Specific considerations include view to substation.
KOP 6	Blue Bell Mine Road	BLM	2.7 miles South	Recreational users	First view of Project area traveling south.
KOP 7	Blue Bell Mine Road	BLM	0.2 miles South	Recreational users	View of Project in immediate foreground.
KOP 8	Rasor OHV Area	BLM	1.2 miles Northwest	OHV users	Representative of other views within higher elevations of the OHV area. Near border with Mojave National Preserve.
KOP 13	Mojave National Preserve Boundary	NPS	0.4 miles West	Dispersed recreational users	Combined with KOP 14, most important locations from NPS perspective. View similar to KOP 5. Designated “Natural Area.” Access not signed. Access route up drainage. Light use, on the magnitude of possibly two visitors per year.
KOP 14	Mojave National Preserve Boundary	NPS	0.7 miles Southeast and Northwest	Dispersed recreational users	Combined with KOP 13, most important locations from NPS perspective. View similar to KOP 5. Designated “Natural Area.” Access not signed. Access route up drainage. Light use, on the magnitude of possibly two visitors per year.
KOP 17	Cave Mountain	BLM	8.1 miles Northeast	Recreational users	On list of Mojave Desert mountain climbs. Includes distinctive high rock cairn. Partially accessed via power line road then up drainages.
KOP 19	Mojave National Preserve: Old Dad Mountain	NPS	17.6 miles Northwest	Recreational users	On list of Mojave Desert mountain climbs. Designated wilderness area.
KOP 28	I-15 at Rasor Road overcrossing	BLM	0.2 miles West	Motorists	View of Rasor Road relocation and operation and maintenance facility complex.
KOP 29	Rasor Road	BLM	0.1 miles East	OHV users	View from point where Rasor Road would be realigned. New kiosk location.

SOURCE: 2M Associates, 2013

The following figures present the existing conditions and photo-simulations of the Project after construction without applying mitigation measures:

Figure 3.18-10 (KOP 1): I-15 traveling north slightly east of the Rasor Road interchange with views of the South and East array areas.

Figure 3.18-11 (KOP 4): I-15 traveling north adjacent to Project site with views of the East Array area and flood control berm.

Figure 3.18-12 (KOP 5): I-15 traveling south with views of the North Array area and substation facilities.

Figure 3.18-13 (KOP 28): I-15/Rasor Road overcrossing with views toward the relocated Rasor Road including the administrative and maintenance facility complex.

Figure 3.18-14 (KOP 29): At the point where the relocated Rasor Road would tie back into the existing road.

The simulations show the scale of the Project, relative placement of features, and other changes in form, line, color and texture. Simulations were not prepared for all KOPs assessed in this report. In some instances this was because the distance of the KOP from the Project area, combined with the viewing angle and atmospheric conditions, would render visibility of the Project area negligible (e.g., KOP 19). In other instances, although the Project would be highly visible from a KOP, a simulation would disproportionately portray perceived impacts because of lack of access to and/or extremely low public use at the KOP, characteristics that normally would disqualify the location as a KOP under VRM guidelines (e.g., KOP 13 and KOP 14). (2M Associates, 2013)

Figure 3.18-5 shows the KOP locations and viewing directions.

3.18.5 Applicant-Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects to visual resources. The impact analysis assumes that these APMs would be implemented as part of the Project.

APM 42: Where appropriate, a paint color acceptable to the BLM shall be used on project buildings to blend more naturally with the existing setting.

APM 43: Lighting on the Project site shall be dark sky-compliant. Lighting shall be limited to areas required for operations or safety, directed on site to avoid backscatter, and shielded from public view to the extent practical. Lighting that is not required during nighttime hours shall be controlled with sensors or switches operated such that lighting will be on only when needed.

3.18.6 Direct and Indirect Effects

3.18.6.1 Alternative A: Proposed Action

The Project would convert 2,222 acres of naturally appearing desert valley to an industrial facility characterized by geometric forms and lines and industrial surfaces that are dissimilar to the surrounding natural landscape character. The majority of the developed area would be covered with solar PV panels. The remainder of the area would include a high-voltage substation and switchyard northwest of I-15 and southwest of the North Array, as well as operation and maintenance buildings and associated facilities.

The Project would employ approximately 1.7 million flat-plate polycrystalline silicon solar panels grouped into tracking arrays as described in Chapter 2. Examples of solar PV developments are shown in Figures 3.18-6 through 3.18-8. Figure 3.18-6 shows ground level and elevated views of the Silver State North solar PV facility near Primm, Nevada, along with a close-up view of the panels. The contrasting color of the inverter boxes can be seen in this figure, in addition to photographs illustrating the effective application of color to the inverter boxes as visual mitigation in Figure 3.18-8.

As discussed above, the primary tool used to analyze visual impacts of the Project is the BLM's visual contrast rating system, which was used to analyze the visual impacts of the Project from 13 KOPs. Figures 3.18-10 through 3.18-14 present both the existing and simulated conditions at five of the KOPs. See Section 3.18.4.1 for a discussion of the rationale behind the KOPs selected for simulations. Documentation of the visual contrast ratings (BLM Form 8400-4, Visual Contrast Rating Worksheet) is included in Appendix G, and the structures' degree of contrast is summarized below in Table 3.18-4 based on the visual contrast analysis (2M Associates, 2013), which was reviewed and verified by the BLM, the County, and their environmental consultant.

The Project would present a high contrast in form, line, and color, particularly as seen from I-15 and other nearby KOP locations. Table 3.18-5 summarizes the contrast rating from the KOPs used in this analysis.

Major contrasts created by the Project common to all nearby KOPs include:

1. The rectilinear edge that is created by the overall layout of the solar arrays and its contrast with the surrounding random pattern and relatively even vegetation textures of the desert.
2. The dark gray color of the PV panels as contrasted with the sand, light tan, and brown colors of the desert soils and mountain backdrop.
3. The white color of the rear surface of the collectors. While this color is not yet determined, it will likely be white.
4. The aluminum frames and corrosion-resistant steel tracker structures the panels would be mounted on.
5. The north-south alignment of the PV panels that in most cases are viewed at an angle such that they create a linear texture in the solar array areas.

TABLE 3.18-4
VISUAL CONTRAST RATING SUMMARY - STRUCTURES

ID	Location	Contrast				Contrast Summary
		Form	Line	Color	Texture	
KOP 1	I-15	Moderate	Strong	Strong	Moderate	Grading would not substantially alter the overall form of the land. The cumulative form of the solar arrays would be low and horizontal and their geometric lines would contrast with the random pattern of the desert floor vegetation. Views of distant mountains would not be blocked. Due to distance, the cleared routes for the buried 34.5 kV collector lines and the substation would not significantly contrast. Depending on sun angle, the conductors would reflect and contrast with backdrop during some portions of day.
KOP 2	I-15	Weak	Strong	Strong	Moderate	Immediate foreground is disturbed from previous mining activity. Grading would not substantially alter the overall form of the land. Geometric lines of the array areas would contrast with the even patterns of the desert floor vegetation. Views of distant mountains would not be blocked. The color of the solar arrays, inverters, and fencing would contrast with the natural colors of the landscape.
KOP 4	I-15	Weak	Strong	Strong	Moderate	Grading would create some low-formed terraces, but not substantially alter the overall form of the land. Form of solar arrays low and horizontal. Geometric lines of engineered diversion berms would contrast with landscape. Lines created by vegetation removal would contrast with even pattern of desert floor. Views of distant mountains would not be blocked. The colors of the solar arrays, inverters, and fencing would contrast with natural colors of the landscape. The substation would contrast in form and color.
KOP 5	I-15	Weak	Strong	Strong	Moderate	Grading would create straight edges, but not substantially alter overall color or texture of land. Form of solar arrays would create canted plane as topography rises. Geometric lines of arrays would contrast with even pattern of desert floor and vegetation. Views of distant mountains would not be blocked. The colors of the solar arrays, inverters, and fencing would contrast with natural colors of the landscape.
KOP 6	Blue Bell Mine Road	Weak	Moderate	Moderate	Moderate	The view is oriented towards the East and South Solar Array areas from an approximate 2.5- to 5.0-mile distance. Distance mutes contrast of form, color, and texture. Lines created by removal of vegetation along solar array areas and collector route would contrast with desert floor. North Array would not be seen.
KOP 7	Blue Bell Mine Road	Strong	Strong	Strong	Moderate	View is directly north of North Solar Array and in immediate foreground of East and South Solar Array areas. The PV collectors would be parallel to view and contrast with graded bare earth in array areas. Views of distant mountains would not be blocked. Geometric lines and patterns of arrays would contrast with randomness of vegetation. Color of solar arrays, inverters, and fencing would contrast with natural colors of the landscape. Distance would mute contrast of color and texture of East and South arrays. Mid-day sun/shadow patterns would create linear texture. Lines created by vegetation removal along solar array edges would contrast with landscape.

TABLE 3.18-4 (Continued)
VISUAL CONTRAST RATING SUMMARY - STRUCTURES

ID	Location	Contrast				Contrast Summary
		Form	Line	Color	Texture	
KOP 8	Rasor OHV Area	Weak	Moderate	Moderate	Moderate	View is oriented to South Arrays from 1.7- to 3.5-mile distance. Observer position is superior looking at alluvial fan canted toward KOP. Distance somewhat mutes contrast of color and texture. Lines created by removal of vegetation along array edges and connector route would contrast with landscape. Geometric forms of solar array area would contrast with smooth lines of wash and bordering ridgelines.
KOP 13	Mojave National Preserve Boundary	Weak	Strong	Strong	Moderate	I-15 and its traffic movement and sound dominate view. Grading within solar array areas create low, leveled areas with geometric edges, but do not substantially alter overall form of land. Form of arrays is low and horizontal. Lines created through vegetation removal along array edges would contrast with landscape. Views of distant mountains would not be blocked. Color of solar arrays, inverters, and fencing would contrast with natural color of landscape. Texture of organized and geometric arrays would contrast with random texture of vegetation. 34.5 kV collector route clearing clearly evident, creating contrast with landscape. Depending on sun angle, conductors would reflect and contrast with landscape.
KOP 14A*	Mojave National Preserve Boundary (looking southwest)	Strong	Strong	Strong	Strong	Observer position is superior, 885 ft above East Arrays. Due to elevation, overall scale of Project and geometric form of arrays would be emphasized. Ground color and PV panel color contrast that would vary in intensity throughout day depending on rotation of PV panels. Vegetation removal from 34.5 kV collector routes and access roads would contrast with landscape.
KOP 14B*	Mojave National Preserve Boundary (looking northwest)	Strong	Strong	Strong	Strong	Observer position is superior, 950 ft above North Array. Due to elevation, overall scale of Project and geometric form of arrays is emphasized. Within planar form of array area, ground color and PV panel color contrast that would vary in intensity throughout day depending on rotation of PV panels. Vegetation removal from 34.5 kV collector routes and access roads would contrast with landscape.
KOP 17	Cave Mountain	None	None	Weak	None	Portions of the East and South Arrays may be seen. Due to distance (8.1 miles), contrast in form, line, and texture would not be noticeable. Distance and atmosphere would mute color contrast. Line created by I-15 remains dominant cultural modification in the view.
KOP 19	Mojave National Preserve: Old Dad Mountain	None	None	Weak	None	Portions of the North Array may be seen. Due to distance (17.6 miles), contrast in form, line, and texture would not be noticeable. Distance and atmosphere would mute color contrast.
KOP 28	I-15 at Rasor Road Crossing	Strong	Strong	Moderate	Moderate	Operation and maintenance area in open view. Water tank, access route, and leveled area would contrast with hill. Form of water tank backdropped by mountains, which draws attention to color of structures. Realignment of Rasor Road would contrast with existing soft lines of landscape. Contrast in forms and textures of operation and maintenance facilities, other than water tank, are extension of existing development at interchange.

TABLE 3.18-4 (Continued)
VISUAL CONTRAST RATING SUMMARY - STRUCTURES

ID	Location	Contrast				Contrast Summary
		Form	Line	Color	Texture	
KOP 29	Rasor Road	Weak	Strong	Strong	Moderate	Observer position inferior to Project features. Realigned Rasor Road, fence, and brine pond berms would be seen approximately 1,000 feet away with solar array area beyond. Inverters may be silhouetted against sky.

NOTE:
* KOP 14 affords views of the South and East Array areas (14A) and the North Array area (14B).

SOURCE: 2M Associates, 2013

TABLE 3.18-5
VIEWING TIMES OF PROPOSED PROJECT FROM ROUTES

Route	Direction	Speed (mph)	Time Project is in View (Approximate Minutes)
I-15	Northeast	70	4.5
I-15	Northeast	70	4.8
Rasor Road	West and east	20	6.5
Blue Bell Mine Road	South	10	10.8

SOURCE: 2M Associates, 2013

6. The line created by security fencing and disturbed vegetation parallel to I-15, the relocated Rasor Road, and Blue Bell Mine Road. This line would be accentuated by the reflective qualities of hot-dipped galvanized fencing.

7. The form and pattern of the inverter enclosures rising above the PV panels.

8. The lines of diversion structures (berms) and channels to manage the area surface hydrology.

9. The reflective qualities of the substation as seen from I-15.

The only proposed overhead electrical lines would be the lines connecting the switchyard and existing 500 kV lines. The switchyard would be situated beneath the lines and would not extend outside the requested ROW boundary. This would represent a very minor contrast with existing conditions that would be common to all nearby KOPs. The slight incremental increase in contrast would be cumulative due to the presence of two existing transmission lines and an electrical distribution line that run parallel to I-15.

Table 3.18-5 shows the amount of time Project facilities would be in view when traveling on nearby roads. Portions of the Project that would be within view from I-15 would last for approximately 4.5 minutes when traveling at 70 miles per hour. When traveling south there is an additional view of the North Array area lasting approximately 20 seconds. The travel time along

the realigned Rasor Road for visitors going to or returning from the Rasor OHV Recreation Area is approximately 6.5 minutes if traveling 20 miles per hour. When traveling south, the travel time along Blue Bell Mine Road from first views of the Project across the North Array is approximately 10.8 minutes traveling at 10 miles per hour.

Overall, the proposed solar field would cause the greatest visual contrast in the character elements of line, color, and texture. The color would be muted from distant viewpoints such as KOPs 17 and 19. For viewpoints superior to the site, including KOPs 13 and 14, the facility would create sharp edge contrasts that are straight and geometric, and uncharacteristic of the surrounding landscape. For KOPs at the same or similar elevations, the low angle of view would greatly diminish the dominance and scale of the Project. This is due to perspective foreshortening, which reduces the apparent size of surfaces of areas or objects, when seen obliquely or at low viewing angles. The line contrasts from such viewpoints are less apparent because they are often coincident with the flat horizon line of the valley floor, although a moderate color contrast may still remain.

The Proposed Action would not meet VRM Class III objectives. The assessment of contrasts from 10 of the 13 KOPs would be strong to moderate/strong. Specifically, visual contrast would be strong to moderate/strong from I-15, Blue Bell Mine Road, and the Mojave National Preserve boundary. The visual impact of the facility from several of the KOPs would be noticeable to and could attract the attention of a casual observer, and in some cases would dominate the visual character of the landscape. The Project would be the most highly exposed from KOPs along I-15, especially for motorists traveling north, as represented by KOPs 1 and 4.

The following analysis discusses the visual effects of the three phases of the Project that have not been otherwise addressed above, as well as additional mitigation measure proposed to reduce visual contrasts.

Construction

During the construction period, earth-moving activities and construction materials, equipment, trucks, and parked vehicles could be visible on the site. Construction would occur over 24 to 30 consecutive months, during which a number of activities would take place, including large-scale vegetation removal, earthwork, as well as foundation and equipment installation. These construction activities could result in a degree of visual contrast within the landscape that is greater than the operation and maintenance phase discussed above for each KOP. This is because the color of the underlying earth (light tan) stands in greater contrast within the landscape than the dark grey or black, non-reflective surfaces of the solar panels that would be installed. However, the overall degree of visual impact would be somewhat lessened because the area covered by any one phase of construction would be smaller compared to full build-out of the Project, and the visual effects would be temporary.

Visual effects of construction could also include the generation of large quantities of airborne dust as well as nighttime construction lighting. The affected viewers would be motorists on I-15, in addition to a low to moderate level of OHV and other dispersed recreational users. Although

the construction period is estimated to be close to 2.5 years, construction would be phased, so that it would not occur in any one place for the entire period. Further, construction activities would be conducted in a manner that minimizes dust emissions, including visible dust, as described in APMs 1 through 8 in Table 2-5. These measures would include limiting the speed of vehicles, surfacing construction access roads, and controlling wind erosion on soil stockpiles and exposed earth.

When nighttime construction activities take place, illumination would be provided that meets state and federal worker safety regulations. To the extent possible, the nighttime construction lighting would be directed downward or toward the area to be illuminated, as described in Section 2.4.2.11, and would be shielded from public view to the extent practical as described in APM 43. Task-specific lighting would be used to the extent practical while complying with worker safety regulations.

Areas disturbed by construction activities that would not be needed during operation and maintenance of the Project would be revegetated according to Mitigation Measure 3.18-2. Finally, earthwork and vegetation manipulation strategies in Mitigation Measures 3.18-1, 3.18-2, and 3.3-2 would assist in toning down the contrast created in earth-moving and vegetation clearing. Adverse visual effects associated with generation of large quantities of airborne dust as well as nighttime lighting during the construction period activities at both the solar field and along linear routes would be reduced with the implementation of Mitigation Measures 3.2-1, 3.2-2, 3.18-1, and 3.18-2. The general visual contrast created by vegetation stripping and the presence of construction materials, equipment, and partially constructed facilities would contribute to the visual contrast apparent in the landscape, which is addressed in the previous section from the perspective of the 13 KOPs.

Operation and Maintenance

During operation and maintenance, visual effects would be caused by the visible elements of the Project. The discussion below focuses on the visual effects that are not captured by visual simulations (nighttime lighting and reflected sunlight/glare), or that are unique to the operation and maintenance phase. In addition, because visual design measures may degrade over time, and in some circumstances, would require monitoring and maintenance, Mitigation Measure 3.18-3 is included to ensure the visual mitigation measures are maintained properly over the life of the Project.

While the potential for glint or glare and nighttime lighting is a component of visual contrast, these issues are treated separately because the simulations used in the visual contrast rating process model the daytime visual change, and do not consider the effect of temporary glare.

Operational Lighting

Project operation would require on-site nighttime lighting for safety and security as discussed previously and in Section 2.4.2.11. Lighting of Project facilities would be dark sky-compliant. Lighting would be limited to areas required for operations or safety, directed on-site to avoid backscatter, and shielded from public view to the extent practical. Lighting that is not required

during nighttime hours would be controlled with sensors or switches operated such that lighting would be turned on only when needed (APM 43). Figure 3.18-9 provides an example of effective nighttime lighting measures with downcast lighting and angled fixtures, though there may be more lighting than necessary at the facility shown. These light sources would be concentrated in a relatively small (4-acre) operation and maintenance area on the southwestern corner of the Project site near the Rasor Road interchange, and a substation situated on 10 acres on the northwest side of I-15, southwest of the North Array area and adjacent to the LADWP 500 kV transmission line, as shown in Figure 2-1. Under normal circumstances, the Project solar field would not be illuminated. While the level of light generated by the Project is expected to be low, especially from the most common public viewpoints, the Project would nevertheless be in an area with very few existing structures, and the use of uncontrolled or excessive lighting could be noticed by nearby motorists on I-15.

Mitigation Measure 3.18-1 requires the preparation of a lighting plan that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operation. The lighting plan will include numerous measures to prevent unnecessary use of lights, minimize light intensity, and prevent light spillage and reflectance to off-site areas. (2M Associates, 2013)

The implementation of these measures would minimize the amount of lighting potentially visible off-site to the extent feasible. While these measures would not totally eliminate the light visible by surrounding user groups, facility lighting would be minimized and controlled such that it would not be a nuisance and would not detract from the ability for affected viewers to enjoy their surroundings or view the night sky. The operation and maintenance area would be located adjacent to the commercial gas station near the Rasor Road interchange, where travelers are typically accustomed to experiencing unnaturally lit areas. On the north side of the freeway, the substation would remain the dominant and most noticeable existing sources of light within the affected viewsheds and would draw attention.

Glint and Glare

Unlike large fields of parabolic mirrors, which have been known to produce fairly intense glint[4] and glare[5] at various times of the day, the use of PV technology is generally regarded as causing minimal glint and glare impacts. Nevertheless, some glare is possible from the surface of the PV panels and other Project components (especially metallic components) that reflect light depending on panel orientation, sun angle, viewing angle, viewing distance, and other factors. For example, Sullivan et al. (2012 as cited in BLM, 2013b) observed glare from a slightly elevated viewpoint at a distance of approximately 2 miles from panels and ancillary components at a partially built PV facility in Nevada. Even though the panels to be used would be a uniform black color, from certain angles and times of day, the panels may appear grey or silvery white due to glare (Sullivan et al., 2012 as cited in BLM, 2013b). Figure 3.18-7 illustrates the apparent color changes of the observed PV facility with differing sun angles and viewing geometry.

4 A flash of light, also known as a specular reflection, produced as a direct reflection of the sun in the parabolic mirror surface.

5 A continuous source of excessive brightness, relative to ambient lighting, also known as diffused reflection.

Potentially affected observers would be travelers on I-15, users of nearby OHV routes, and visitors to adjacent mountains and the Mojave National Preserve. It is possible that back reflected light or light not absorbed by Project facilities could produce minor glare, particularly when the viewer is positioned in line with the sun. This glare could occur in any one place for several hours (e.g., a sunny afternoon) but is unlikely to be visually distracting or nuisance causing. It is possible, however, that glare produced by the Project would be more intense than any other natural or cultural features in an observer's perspective. Glare produced by diffuse reflections would increase the color contrast of the Project in the landscape, but would not be sufficiently intense or distracting as to increase any of the contrast ratings in Table 3.18-4 to "strong."

Several measures are available that would reduce the potential for and frequency of glare from the solar fields. Mitigation Measure 3.18-1 requires the development of a Glint and Glare Assessment, Mitigation, and Monitoring Plan. This measure would also require reflective surfaces to be painted or treated so long as it would not impair proper function of the equipment or structure. Further, Mitigation Measure 3.18-3 would ensure that surface treatments are maintained during operation and maintenance so as to prevent degradation of colored or treated surfaces. These mitigation measures would reduce the extent of reflective surfaces within the solar fields, but would not prevent spread reflections off the face of the solar panels. Therefore, the color contrast of the solar panels during certain times of the day when the viewer is positioned in line with the sun would momentarily increase, but not to such an extent as to result in a change in the severity of the contrast rating in Table 3.18-4.

Decommissioning

Decommissioning would remove Project-related structures and infrastructure so that affected lands could naturalize. However, until vegetative restoration is achieved, adverse visual impacts would be similar to those described in the construction-phase impacts, because large areas would be devoid of desert scrub vegetation. Implementation of Mitigation Measures 3.18-1 and 3.18-4 would aid greatly in reducing the visual effects of decommissioning. Mitigation Measure 3.18-4 would require the Decommissioning and Site Reclamation Plan to include reclamation of the area of disturbed soils used for laydown, Project construction, and siting of the other ancillary operation and support structures. Further, Mitigation Measure 3.18-4 would reduce the amount of disturbed area and blend the disturbed areas into the characteristic landscape. It would require replacement of soil, brush, rocks, and natural debris over disturbed areas. Newly introduced plant species would be of a form, color, and texture that blends with the landscape. These measures would ensure the visual impacts of decommissioning are minor and short-term.

Impacts to Special Designation Areas

In 2012, 2M Associates completed an extensive analysis of the potential impacts to the Mojave National Preserve. Based upon the viewsheds (Appendix G) and photography, the BLM and its environmental consultant determined that the Project would not block views of the Mojave National Preserve from existing highways or designated routes of travel. Further, there is no point within the Preserve from which the entire Project site would be visible, though large areas within the Preserve would potentially afford views of some portions of the solar array areas and/or the

substation site. However, the combined effect of distance and atmospheric conditions would mute the detail and contrast of Project features against the backdrop of the Soda Mountains. With increased distance from the Project, perceptibility would decrease. Thus, as potential viewpoints within the Preserve increase in distance from the Project, the Project would become correspondingly smaller and harder to see.

Foreground/Middleground Distance Zone (up to 5 miles)

Foreground/middleground visibility of the Project from within the Preserve is limited to:

1. Portions of the western slope of the Soda Mountains that are in close proximity to the Project's North and South Array areas. This southern arm of the Soda Mountains provides an effective foreground/middleground screen from the Project site for nearby routes of travel such as Zzyzx Road or destination areas such as Soda Spring or the Desert Studies Center. The cumulative total of the area from which the Project may be seen from within the Preserve in the foreground/middleground distance zone covers approximately 350 acres. This represents 0.0002 percent of the 1.6-million-acre Preserve. The area is designated as a Natural Area within the Mojave National Preserve General Management Plan.

2. Preserve lands to the southeast of the Project area may view the North Array area from an inferior viewing position. These lands include portions of the Old Spanish National Historic Trail, the Mojave Road, and designated Wilderness Area lands around Soda Lake.

Foreground/middleground views of the Project site from elsewhere in the Preserve would be blocked by the Soda Mountains.

KOPs 13 and 14 are located within this boundary area on the edge of the Preserve. NPS staff indicated that there may be only one or two people who might hike to the edge of the Preserve boundary each year. In addition, because public access to this general area potentially may impact the presence of bighorn sheep, Preserve staff have indicated a desire to avoid encouraging human access into these mountains.

Accessing these KOPs involves cross-country hiking. The route is entirely within the Preserve and follows a wash that parallels I-15 to KOP 13 and then up a canyon to KOP 14. The canyon route from KOP 13 up to KOP 14 is visually removed from the East and South Solar Array areas of the Project area until within a few feet of the mountain ridgeline on which KOP 14 is located.

There are no signs, parking areas, or trails to KOP 13 or KOP 14 to facilitate a self-guided learning experience for the general public and none are planned by NPS. The route to KOP 13 is moderately difficult while the climb to KOP 14 is very rugged. There is a high level of noise emanating from I-15. There are no on-site visitor or resource management activities visible from the KOPs. Visitation levels are extremely low, if any, over an extended period of time, and no visitation records are maintained.

Views from KOP 13 include I-15 in the immediate foreground with the North Array located on the alluvial fans between I-15 and the backdrop Soda Mountains. A portion of the North Array would be seen and would be similar to the view from KOP 5.

Views from KOP 14 are panoramic and are accented with mountain peaks and ridgelines. The panorama spans I-15 from north of Halloran Summit to the Rasor Road interchange and includes the town of Baker. The Project would be seen virtually in full view. The Project would not block any views from the Preserve. The contrast in color and pattern created by the Project would be strong but with limited effect from the public's perspective because of the inaccessibility of the KOP at the edge of a mountain range that bounds and visually protects the remainder of the Preserve.

Background Distance Zone (5 to 15 miles)

Portions of the Project site may be seen from the background and seldom seen distance zones. Portions of the North Array, and to a lesser extent the substation, may be seen from within areas of the Preserve east of the Project site. The South Arrays might be seen from selected lower elevation areas in the south of the Preserve. Other portions of the Project site are shielded from view by the south Soda Mountains.

KOP 19 (Mojave National Preserve, Old Dad Mountain) is representative of background/seldom seen distance views. In the vast majority of background/seldom seen viewshed locations within the Preserve, views are expansive such that while a portion of the Project site that might be seen, it would be less than 1 percent of the total view, and when combined with atmospheric conditions, difficult to notice at such distances.

Contrast

The view from KOP 13 is dominated by the sights and sounds of I-15 and its continuous traffic. The view is similar to that a motor vehicle driver would have from KOP 5. The western portion of the North Array would be seen. Grading within the solar array areas would create the appearance of low-formed terraces with straight edges, but not substantially alter the overall form of the land. The overall form of the solar arrays would retain a low profile, creating a textured canted plane as the topography rises. The lines created along the rectilinear edges of the array areas through removal of vegetation would contrast with the even pattern of the desert floor and existing vegetation. Views of distant mountains would not be blocked. The lines and patterns of the solar arrays would be rank and file and contrast with the randomness of the surrounding vegetation. The color of the solar arrays, potential colors of the inverter enclosures, and glare from silver galvanized fencing would strongly contrast with the flat light browns of the desert soils and olive greens of vegetation.

The observer position from KOP 14 looking in any direction is superior. The KOP is approximately 885 feet above the East Arrays and approximately 950 feet above the North Array. Because of height, the overall scale of the Project and rectilinear form of the solar arrays would be emphasized. Within the overall planar form of the array area, the ground color and PV panel color would strongly contrast to create obvious linear patterns that would vary in intensity during the day from a combination of dark gray to flat off-white depending on the rotation of the PV panels. Vegetation removal associated with the underground 34.5 kV collector lines and access roads would appear as light tan lines that contrast with the surrounding vegetated landscape.

The observer position from KOP 19 on top of Old Dad Mountain is superior and would provide the maximum visibility of the Project site compared to lower Preserve locations. These locations would include Kelbaker Road, Seventeen Mile Point, and Kelso Road. At the distances of these locations from the Project site, any form, line, and texture changes created by Project components would be backdropped by mountains and would not be noticeable. A very weak contrast may be created through a change of color. However, distance and atmosphere would mute the general color contrast such that it would be barely noticeable. (2M Associates, 2013)

3.18.6.2 Alternative B

The direct and indirect impacts of Alternative B would be similar in nature, but reduced compared to the impacts of the Proposed Action, as the size of the facility and the duration of construction would be reduced. Alternative B would consist only of the East and South Arrays as described for the Proposed Action, as shown in Figure 2-8. The North Array would not be constructed. The substation and switchyard would be constructed in the same location as the Proposed Action, except that no collector lines would feed into the substation from the north. Only the collector lines from the East and South arrays, combined into a single route before crossing I-15, would feed into the substation. The operation and maintenance area buildings and brine ponds would be constructed as proposed in the Proposed Action. Primary site access to Alternative B would be via the alternative realignment of Rasor Road. Access to the substation would be provided in the same manner as for the Proposed Action, i.e., via Zzyzx Road and Blue Bell Mine Road.

The area occupied by the solar arrays would be reduced by approximately 26 percent. Because the construction duration under Alternative B would be reduced, the visual impacts that are unique to the construction and decommissioning phases (grading, fugitive dust, construction-related lighting, etc.) would be the same in type and intensity, but would be reduced in duration and geographic extent. During operation and maintenance, the views from KOP 7 along Blue Bell Mine Road would experience the greatest reduction of impact, as the only solar arrays visible would be the East and South Arrays on the southeast side of I-15. The superior views of the valley from KOPs 13 and 14 would also perceive less impact. Views from KOPs 2, 5, and 19 would experience less impact due to the removal of the North Array area. The impact would only be slightly minimized, if at all, from KOPs 1 and 4, where the viewer is at a low angle and the South and East array areas command the viewer’s attention to the foreground. However, impacts would be diminished as motorists travel along I-15 north of KOP 4 due to the removal of the North Array. The alternative Rasor Road realignment route would be located further from most KOPs, and views of most of the route would be blocked by topography. This route would not be more visible or create greater contrast from any KOP than the Applicant-proposed Rasor Road realignment. The visual contrast ratings presented in Table 3.18-4 would not change for KOPs 6, 8, 17, 28, and 29. Because the location of the substation would not change, all impacts regarding views of the substation would be identical to those of the Proposed Action. All mitigation measures identified for the Proposed Action would result in a similar degree of reduction in the apparent visual contrast caused by Alternative B.

Alternative B would not meet VRM Class III objectives. The assessment of contrasts from Alternative B would be strong to moderate/strong from KOPs 1, 4, 28, and 29. The visual impact of the facility from these KOPs would be noticeable to and could attract the attention of a casual observer, and in some cases would dominate the visual character of the landscape.

3.18.6.3 Alternative C

The direct and indirect impacts of Alternative C would be similar in nature, but reduced compared to the impacts of the Proposed Action, as the size of the facility and the duration of construction would be reduced. The Alternative C solar plant site would consist only of the North and South Arrays as shown in Figure 2-9 and as described for the Proposed Action. The East Array would not be constructed. The substation and switchyard would be constructed in the proposed location; however, no collector line would be constructed from the East Array. The operation and maintenance area buildings and brine ponds would be constructed as proposed under the Proposed Action. Access to the South array could be provided either via the Proposed Action realignment of Rasor Road or the Alternative B realignment; however, the analysis of Alternative C in Chapter 3 assumes that the Proposed Action (Applicant-proposed) realignment would be used.

The area occupied by the Project would be reduced by approximately 17 percent. Because the construction duration under Alternative C would be reduced, the visual impacts that are unique to the construction and decommissioning phases (grading, fugitive dust, construction-related lighting, etc.) would be the same in type and intensity, but would be reduced in duration and geographic extent. During operation and maintenance, the view from KOP 4 would experience the greatest reduction of impact, as only the North Array area would be visible, which would appear as a low, horizontal band of dark color contrasting with the landscape. Impacts would also be reduced from KOPs 1, 6, 7, 13, 14, and 17. The visual contrast ratings presented in Table 3.18-4 would not change for KOPs 2, 5, 8, 19, 28, and 29. All mitigation measures identified for the Proposed Action would result in a similar degree of reduction in the apparent visual contrast caused by Alternative C.

Alternative C would not meet VRM Class III objectives. The assessment of contrasts from Alternative C would be strong to moderate/strong from KOPs 2, 5, 28, and 29. The visual impact of the facility from these KOPs would be noticeable to and could attract the attention of a casual observer, and in some cases would dominate the visual character of the landscape.

3.18.6.4 Alternative D

The direct and indirect impacts of Alternative D would be similar in nature, but reduced compared to the impacts of the Proposed Action, as the size of the facility and the duration of construction would be reduced. The components and configuration of Alternative D are shown in Figure 2-10. The Alternative D solar plant site would consist of the North Array as described for the Proposed Action, and the East and South Arrays would be reduced in size. The substation and switchyard would be constructed in the proposed location; however, no collector line would be constructed from the East Array. The operation and maintenance area buildings and brine ponds

would be constructed within the footprint of the reduced South Array, located at the intersection of Rasor Road and Arrowhead Highway. Under Alternative D, no realignment of Rasor Road would occur. Instead, the existing Rasor Road (a BLM-designated open route) would be used for site access on the southeast side of I-15.

The area occupied by the Project would be reduced by approximately 30 percent. Because the construction duration under Alternative D would be reduced, the visual impacts that are unique to the construction and decommissioning phases (grading, fugitive dust, construction-related lighting, etc.) would be the same in type and intensity, but would be reduced in duration and geographic extent. The view from KOP 29 may experience some reduction of impact, as the arrays would only be located to the right of the existing Rasor Road versus the Proposed Action, which would displace Rasor Road with additional PV panels extending to the south. However, the PV panels on the left side of the road in the Proposed Action would mostly be screened by topography and vegetation. Nevertheless, the visual impact from the South Array area (on the right side of the road) would still be minimized. Additionally, Rasor Road would not be relocated, eliminating the need to clear vegetation for the road alignment. Impacts would also be reduced for the viewpoints from which the minimized East and South Array areas are visible. These include KOPs 1, 4, 6, 7, 8, 13, 14, 17, and 28. The visual contrast ratings presented in Table 3.18-4 would not change for KOPs 2, 5, and 19. All mitigation measures identified for the Proposed Action would result in a similar degree of reduction in the apparent visual contrast caused by Alternative D.

Alternative C would not meet VRM Class III objectives. The assessment of contrasts from Alternative C would be strong to moderate/strong from KOPs 2 and 5. The visual impact of the facility from these KOPs would be noticeable to and could attract the attention of a casual observer, and in some cases would dominate the visual character of the landscape.

3.18.6.5 Alternative E: No Action/No Project

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not approve the groundwater well permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. Because the Project would not be approved, no new structures or facilities would be constructed, operated and maintained, or decommissioned on the site, and no related ground disturbance or other Project impacts would occur. The BLM would continue to manage the land under its land use jurisdiction consistent with the site's multiple use classifications as described in the CDCA Plan.

Under this Alternative, the visual appearance of the site would not change from existing conditions. The No Action Alternative would cause no change relative to baseline conditions and would not result in the visual impacts described for the Proposed Action.

Alternative E would meet VRM Class III objectives.

3.18.6.6 Alternative F: CEQA No Project

Alternative F differs from the Proposed Action and Alternatives B, C, and D only in the respect that the County would deny the requested groundwater well permit application, thereby necessitating water to be transported by truck to the site to meet construction, operation, maintenance, and decommissioning water demands. Additional visual impacts would result from the amount of traffic required to provide water to the site.

Alternative F would not meet VRM Class III objectives for the same reasons described for Alternative A, B, C, and D, respectively.

3.18.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project and would amend the CDCA Plan to identify the site as unsuitable for future solar development, and the County would not approve the groundwater well permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. Because the Project would not be approved, no new structures or facilities would be constructed, operated, maintained, or decommissioned on the site, and no related ground disturbance or other Project impacts would occur. The BLM would continue to manage the land under its land use jurisdiction consistent with the site's multiple use classifications as described in the CDCA Plan, with the exception that no solar development would be allowed on this site.

Under this Alternative, the visual appearance of the site would not change from existing conditions. Alternative G would cause no change relative to baseline conditions and would not result in the visual impacts described for the Proposed Action.

Alternative G would meet VRM Class III objectives.

3.18.7 Cumulative Effects

Impacts resulting from construction, operation, maintenance, and decommissioning of the Project could result in a cumulative effect on visual resources in combination with other past, present, or reasonably foreseeable future actions. Direct and indirect effects of the Project are analyzed above. Overall, visually complex, man-made industrial landscapes would contrast greatly with the surrounding generally naturally appearing lands, with the exception of locations where large renewable energy facilities have been built. However, in some instances, siting a new facility in a previously developed landscape may exceed the landscape's visual absorption capability, and thereby create more negative impacts than sting the facility in an undeveloped area (BLM, 2013b). As discussed below, the cumulative scenario would have a moderate to major (depending on visual sensitivity and visual exposure factors) adverse impact on the I-15 view corridor. The

cumulative scenario would present an unavoidable and adverse impact for travelers along I-15 that could not be feasibly mitigated.

The geographic scope of the cumulative effects analysis for visual resources consists of the viewshed of the I-15 corridor, and locations from which a viewer could see the Proposed Action along with views of other projects. Large visual impacts within the viewshed would be associated with solar energy due to major modification of the character of the existing landscape. Mitigation measures recommended for this and other renewable energy projects would have a limited ability to appreciably reduce visual impacts from highly exposed areas, such as I-15. The large-scale nature of projects in the cumulative scenario, in addition to the fact that one of the cumulative projects includes 475-foot-tall power towers, results in a cumulative scenario that would have adverse impacts on the visual values in the visual resources cumulative geographic scope.

Cumulative visual impacts could occur as long as the Project contributes to visual changes to the landscape that are visible or perceived by the public, either within the same viewpoints, or as a noticeable element in a cumulative viewing experience (e.g., an OHV travel route, a drive on I-15, or a local road); thus, the temporal scope of the cumulative effects analysis includes the construction, operation and maintenance, and decommissioning and restoration phases.

Existing conditions within the area of cumulative effects analysis reflect a combination of the natural condition and the effects of past actions and are described in Section 3.18.2. Numerous existing cultural modifications are visible from the I-15 corridor, including transmission lines, pipelines, 4-wheel drive tracks, and widely scattered facilities and structures. However, the general character is of an unimpaired, isolated desert landscape. Existing large-scale solar projects that have been constructed include the Ivanpah Solar Electric Generating System Project 4.5 miles southwest of Primm, Nevada along I-15. The project consists of three 475-foot-tall solar power tower receivers that emit a bright light when in operation during the day. The towers are surrounded by large, concentric, highly reflective heliostat fields that direct sunlight to the receiver. The Silver State North PV Solar project is located in Nevada, along the I-15 corridor in Ivanpah Valley. It was constructed on 618 acres of BLM-administered land, and was the first large-scale solar energy facility on public lands to provide power to the grid.

Current and reasonably foreseeable future actions making up the cumulative scenario are identified in Table 3.1-3. Among them, solar projects such as the Abengoa Mojave and Stateline projects are expected to result in synergistic visual impacts for travelers along I-15, as well as additive visual impacts to dispersed recreational users on BLM lands and local roads. Visual changes as a result of other types of projects in the cumulative scenario, including the Silurian Valley Wind Project, Silurian Valley Solar Project, XpressWest High Speed Passenger Rail Project, Calnev Pipeline Expansion Project, Joint Port of Entry project, and various communications sites would be visible to travelers on I-15. If all of the solar projects included in Table 3.1-3 were to be implemented, they would convert roughly 15,200 acres within the I-15 corridor viewshed roughly between Primm, Nevada and Victorville, California (approximately 145 miles) from an undeveloped desert to a more industrialized appearance. The Proposed Action would convert an additional 2,222 acres of undeveloped land, which would represent 12.8 percent

of the total cumulative effect. Alternative B would convert 1,647 acres (9.8 percent of the total cumulative effect), Alternative C would convert 1,823 acres (10.7 percent), and Alternative D would convert 1,717 acres (10.2 percent). Alternatives E and G would have no impact on visual resources, and therefore would not contribute to cumulative effects. Alternative F would result in the same conversion of land as the site layout alternative selected (i.e., the Proposed Action or Alternative B, C, or D), and would result in additional truck trips to and from the site, contributing incrementally to the industrialized appearance of the site.

The section of I-15 between Afton Road and Zzyzx Road is described as a series of rocky hills leading to distant mountains, with very limited signs of visual disturbance outside the freeway corridor. The combined effect of large-scale landscape alterations that would be visible along the length of I-15 within the CDCA Plan area could substantially degrade the visual character and the general scenic appeal of the expansive landscape character of the desert. However, in many cases, the apparent scale of the projects from motorists' perspective could be diminished greatly by favorable topographic relationships and distance. Because the landscape is currently undeveloped and valued by visitors for its isolated and unspoiled conditions, the addition of numerous new large-scale solar projects would degrade the scenic experience for many travelers along I-15.

Potential cumulative effects on visual resources could occur during any phase of the Project, including the proposed 24- to 30-month construction period. Cumulative construction disturbances could include traffic, temporary facilities and equipment, and dust from earth moving and exposed soil. Operation and maintenance-related cumulative visual impacts of solar power projects would result from nighttime security lighting as well as increased vehicle and personnel activity in the area relative to baseline conditions. Decommissioning and restoration activities would contribute visual impacts to cumulative conditions until the completion of this phase. At that time, the Project's contribution to cumulative impacts to visual resources would cease and the landscape on the Project site would be returned to its original condition. Given the number of projects built and proposed along the I-15 corridor, the disturbed areas within the landscape would contribute to the cumulative impact.

3.18.8 Mitigation Measures

Mitigation Measure 3.18-1: Siting and Design. Visual design elements shall be integrated into the construction plans, details, shop drawings and specifications; these shall include, but not be limited to, grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural plans. Visual design elements within the plans shall be measureable and monitored while under construction, while operational, and when decommissioned.

The plans shall include a Glint and Glare Assessment, Mitigation, and Monitoring plan that accurately assesses and quantifies potential glint and glare effects and determines the potential health, safety, and visual impacts associated with glint and glare. The assessment shall be conducted by qualified individuals using appropriate software and procedures. The assessment results shall be made available to the BLM in advance of Project approval. (BLM, 2013b)

A careful study of the site shall be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered as well as seasons of peak visitor use (September 15 to April 15). Visual design elements to be integrated into construction plans, details, shop drawings and specifications must at a minimum include:

1. *Locate or screen solar collectors to avoid off-site glare* – Where significant off-site glare is unavoidable, employ materials to reduce the effect such as fencing with privacy slats, earthen berms, or vegetative screening,

2. *Vary the grid layout to reduce contrast caused by long straight roads* – Employ an off-set in the grid layout to reduce visual contrast caused by long straight roads and, to the extent possible, arrays. The result shall be that no road extends from one side of the solar field to the other in a straight line. To further reduce contrast caused by exposing un-oxidized soils and rock in roadways, at select locations of concern from KOPs, spot applications of a product such as Permeon shall be used to dull and darken the ground plane in a short time.

3. *Minimize project footprint and associated disturbance* – Perimeter clearing for a patrol road (typically 20 feet) inside and outside of the Project fenceline shall be minimized (maximum 16 feet) with consideration of the local fire regime. Vegetation shall not be fully cleared but cut to 6-inch height to retain texture over the ground plane.

4. *Color treat structures to reduce contrasts with the existing landscape* – In order to ensure the implementation of APM 42 and supplement its requirements to address adverse impacts, the Applicant shall color treat all operation and maintenance facilities, rear surfaces of the collectors, frames, tracker structures, PCS, and water tank facilities using a BLM standard environmental color that is identified through a site study for color and texture selection and approved by the BLM. Grouped structures shall be treated with the same color. Further:

    a. Security fencing shall be coated with black poly-vinyl or other visual contrast reducing color.

    b. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.

    c. Materials, coating, or paints having little or no specular or reflective qualities shall be used on structures including, but not limited to, buildings, tanks, fences, fence railings, poles, aboveground pipes and culverts, and reverse sides of signs and guardrails. Substation equipment shall be specified with a low-reflectivity neutral finish. Insulators at substations and on takeoff equipment shall be non-reflective and non-refractive. The surfaces of substation structures shall be given low-reflectivity finishes with neutral colors that contrast minimally with the surrounding landscape. Chain-link fences are to have a dulled, darkened finish to reduce contrast.

5. *Lighting* – In order to ensure the implementation of APM 43 and supplement its requirements to address adverse impacts, all permanent lighting, except as required to meet minimum safety and security requirements, shall use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the light source), and must meet the Illuminating Engineering Society (IES) glare requirement limiting intensity of light from the luminaire in the region between 80 and 90 degrees from the ground. All fixtures must be mounted properly, at the proper angle. Further:

a. Construction and permanent lighting – Except as required to meet safety and security requirements, lighting shall be minimized during construction and operation. Lighting shall be mounted and directed to focus light only on the intended area, and to avoid light spill and off-site light trespass. Lights pointing upward or horizontal are to be avoided. During construction, localized and portable lighting shall be used where and when the work is occurring. Lighting is to be powered by generators and have switches to cut power when lighting is not required by construction.

b. Facility lighting – Lighting for facilities shall not exceed the minimum number, intensity, and coverage required for safety and basic security. Lighting shall be amber in color when accurate color rendition is not required. Use low-pressure sodium lamps or yellow LED lighting, or equivalent. No bluish-white lighting shall be used in permanent outdoor lighting.

c. Area lighting – All area lighting shall be divided into separately controlled zones to focus lighting on smaller areas where tasks are being performed and to avoid illuminating unused space. Area lighting is to be controlled by timers, sensors, or switches available to facility operators. The facility operators are to identify those components/structures that do not require continuous lighting for safety reasons. Area lights are only to be switched on when there is a specific need (e.g., cleaning panels at a solar facility, persons occupying an area, or alarm situation).

d. Lighting plan – A lighting plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operation. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security, and shall not cause excessive reflected glare. Low-pressure sodium light sources shall be used to reduce light pollution. Full cut-off luminaires shall be used to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the Project boundary. Lights in highly illuminated areas that are not occupied on a continuous basis shall be equipped with switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The lighting plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts.

6. Vegetation and ground disturbance associated with access road construction, and distribution line installations shall be minimized and take advantage of existing clearings wherever feasible.

7. Along all off-site access roads, all off-site distribution line corridors, and all internal access roads 16 feet or wider, graveled surfaces, areas to be permanently cleared of vegetation, and (if applicable) cut slopes shall be treated with rock stains or other color treatment appropriate with the surrounding landscape.

8. Openings in vegetation for facilities, structures, and roads shall be feathered and shaped to repeat the size, shape, and characteristics of naturally occurring openings.

9. The distribution line shall utilize nonspecular conductors and nonreflective coatings on insulators.

Mitigation Measure 3.18-2: Construction. A pre-construction meeting with BLM landscape architects or other designated visual/scenic resource specialists shall be held before construction

begins to coordinate on the VRM mitigation strategy and confirm the compliance checking schedule and procedures. Final design and construction documents will be reviewed for completeness with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The construction documents shall include, but not be limited to grading, drainage, revegetation, vegetation clearing, and feathering plans, and must demonstrate how VRM objectives will be met, monitored, and measured for conformance.

1. The Applicant shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving existing, native vegetation to the extent feasible; utilizing undulating surface-disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation.

2. Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin.

3. Existing rocks, vegetation, and drainage patterns shall be preserved to the extent feasible.

4. Brush-beating or mowing or using protective surface matting rather than removing vegetation shall be employed where feasible.

5. Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas.

6. The visual color contrast of graveled surfaces shall be reduced with approved color treatment practices.

7. No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate surveyor construction activity limits.

8. All stakes and flagging shall be removed from the construction area and disposed of in an approved facility.

Mitigation Measure 3.18-3: Operation and Maintenance. Terms and conditions for VRM mitigation compliance should be maintained and monitored for compliance with visual objectives, adaptive management adjustments, and modifications as necessary and approved by the BLM landscape architect or other designated visual/scenic resource specialist. Minimum measures are as follows:

1. The Applicant shall maintain revegetated surfaces until a self sustaining stand of vegetation is re-established and visually adapted to the undisturbed surrounding vegetation. No new disturbance shall be created during operation without completion of a VRM analysis and approval by the AO.

2. Interim restoration shall be undertaken during the operating life of the Project as soon as possible after disturbances.

3. Painted facilities shall be kept in good repair and repainted when color fades or flakes.

4. Color-treated solar panel backs/supports shall be kept in good repair, and retreated when color fades and/or flakes.

Mitigation Measure 3.18-4: Decommissioning and Site Reclamation. A Decommissioning and Site Reclamation Plan, covering visual impact mitigation measures, shall be in place prior to construction, and reclamation activities should be undertaken as soon as possible after disturbances occur and be maintained throughout the life of the Project. The following decommissioning/reclamation activities/practices shall be implemented to partially mitigate visual impacts associated with solar energy development, where feasible:

1. Pre-development visual conditions, and the B-Quality scenery (BLM, 2010a) and integrity shall be reviewed, and the visual elements of form, line, color, and texture shall be restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the better visual quality and most ecologically sound outcome.

2. A Decommissioning and Site Reclamation Plan shall be developed, approved by the BLM, and implemented. The plan shall require that all aboveground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the Project's visual mitigation and reclamation objectives.

3. Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscapes. The Applicant shall contour to a rough texture (i.e., use large rocks/boulders, grade uneven surfaces, and/or vegetation mulches/debris) in order to trap seed and to discourage off-road travel, thereby reducing associated visual impacts.

4. A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of decommissioning activities enabling direct transplanting shall be utilized. Where feasible, native vegetation shall be used for revegetating to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.

5. Stockpiled topsoil shall be reapplied to disturbed areas, and the areas shall be revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where applicable, or by using a mix of native and non-native species if necessary to ensure successful revegetation. Gravel and other surface treatments shall be removed or buried.

6. Rocks, brush, and vegetal debris shall be restored whenever possible to approximate preexisting visual conditions.

7. Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes.

8. A decommissioning VRM Monitoring and Compliance Plan shall be prepared by the Applicant and approved by the BLM that establishes the schedule and terms for monitoring and the conditions and methods of measurement for determining compliance.

3.18.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, residual impacts to visual resources will remain. The Project would not only alter the physical characteristic of the landscape, but also would change the scenic values and experiences of visually sensitive users. The Mojave Desert is valued by many for its largely untouched expanse and tranquil setting in a quickly developing world. The Project would contribute to the transformation of the Project site from a largely natural landscape to more industrialized in character. Nearby landscapes such as the Mojave Natural Preserve, which contains a ridgeline boundary within the viewshed of the Project, would experience residual effects with the transformation of the valley of the Soda Mountains at the base of the ridge.

Visitors traveling to the Mojave Natural Preserve from the south would view the Project in advance of reaching the Preserve, thereby disrupting an experience of traveling through a natural desert landscape to reach the Preserve. Additionally, the experience of visitors with historic interests who enjoy exploring the Blue Bell Mine and traveling through a natural desert landscape would be affected as they could be traveling immediately adjacent to the North Array, and would have views of the South and East Arrays as they travel along portions of Blue Bell Mine Road. Local residents, who have chosen to live in this area because of their preference for undeveloped desert open space, would be affected by the Project's contribution to changing the scenic character and values. Other visually sensitive viewers who would experience residual effects of the Project may include tourists traveling between Las Vegas and Los Angeles, and OHV users who choose to visit the Rasor OHV Area for its remote setting and quality of open space.

The implementation of Mitigation Measures 3.18-1 through 3.18-4 would reduce, but not eliminate, adverse cumulative impacts to visual resources visible from the KOPs and the I-15 corridor. These residual impacts of the Project and alternatives would be unavoidable.

3.18.10 CEQA Significance Thresholds and Determinations

Based on CEQA Guidelines Appendix G Section I, a project would have a significant impact on visual resources if it would:

a) Have a substantial adverse effect on a scenic vista;

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) Substantially degrade the existing visual character or quality of the site and its surroundings; or

d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

3.18.10.1 Alternative A: Proposed Action

a) Impact Vis-1: The Project would have an adverse impact on a scenic vista. (Less Than Significant with Mitigation Incorporated)

The San Bernardino County General Plan does not specifically identify scenic vista points in the vicinity of the Project. However, Policy OS 5.1 of the general plan states that roadways, vista points, or areas that provide a vista of undisturbed natural areas will be considered for designation as scenic resources. According to the general plan, a "scenic route" is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County. I-15 within the vicinity of the Project is a county-designated scenic route. As such, for purposes of this analysis, I-15 is considered to provide views of scenic vistas for motorists on the roadway.

The Project would be visible from I-15, Blue Bell Mine Road, Rasor Road, the Rasor OHV Area, the Mojave National Preserve boundary, Cave Mountain, and Old Dad Mountain. KOPs have been identified at all of these locations, which (except for I-15) are not identified in County planning documents as scenic vistas but are treated as such for purposes of this analysis. I-15 experiences the most use, with an estimated 28,000 vehicles per day (Caltrans, 2012) as described in Section 3.16, *Transportation and Travel Management*. The ridgeline of the Soda Mountains (which is the boundary of the Mojave National Preserve), Cave Mountain, and Old Dad Mountain would experience the most visual impacts in line and color contrasts and receive very few visitors, on the magnitude of possibly two visitors per year.

Sensitivity varies with types of users. For example, a commercial driver along I-15 may view the landscape differently than a family visiting for recreational purposes or a resident who prefers the expansive and undeveloped nature of this area. Travelers along I-15 include commuters between the Los Angeles region and Las Vegas, commercial truck traffic, local commuters, and tourists. Rasor Road is used almost exclusively by the OHV community. Blue Bell Mine Road is used by tourists interested in the cultural history of mining and by OHV enthusiasts.

The Project would permanently convert approximately 2,222 acres of naturally appearing desert valley to an industrial facility characterized by geometric forms and lines and industrial surfaces that are dissimilar to the surrounding natural landscape character. The visual changes to the existing landscape would occur over a wide geographic area and in locations with varying degrees of visual sensitivity. Overall, the proposed solar field would cause the greatest visual contrast in the character elements of line, form, and color. The large scale of the Project would create a visual contrast in color, line, and texture from distant viewpoints, such as KOPs 6, 8, 13, 14, 17, and 19 as shown in Figure 3.18-5. The solar field would create a visual contrast in color relative to the surrounding landscape, and the facility would create sharp edge contrasts that are straight and geometric in relation to the soft and irregular lines of the surrounding landscape. This is particularly true as the observer gains elevation relative to the Project site. For KOPs at the same or similar elevations, the low angle of view would greatly diminish the dominance and scale of the Project. This is due to perspective foreshortening, which reduces the apparent size of surfaces of areas or objects, when seen obliquely or a low viewing angles. The line contrasts from

such viewpoints are less apparent because they are often coincident with the flat horizon line of the valley floor, although a moderate color contrast may still remain. During much of the year, the visual contrast of the facility could be reduced because of diminished visibility caused by haze and dust, and less frequently by rain and clouds.

As shown in Table 3.18-4, due to the size, orientation, and low horizontal form of the Project components, the Project would not block views of the surrounding mountain ranges. However, due to the undeveloped nature of this location, the visual impact of the facility from several of the KOPs would be noticed, the Project could attract the attention of a casual observer, and in some cases dominate the visual character of the landscape. The Project would have the greatest impact from viewpoints along I-15, especially for motorists traveling north, as representative of KOPs 1 and 4, shown in Figures 3.18-10 and 3.18-11.

In summary, the impact of construction, operation, maintenance, and decommissioning of the Project on scenic vistas would be adverse, but it would not dominate the landscape character from the main vantage points in the study area. Even so, this would be a significant impact to scenic vistas. With implementation of Mitigation Measures 3.18-2 (Construction), 3.18-3 (Operation and Maintenance), and 3.18-4 (Decommissioning and Site Reclamation), this impact would be less than significant.

The analysis of potential cumulative effects to scenic vistas considers the impacts of the Project in combination with those of other projects in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that, like the Project, would be visible from I-15, Blue Bell Mine Road, Rasor Road, the Rasor OHV Area, the Mojave National Preserve boundary, Cave Mountain, and Old Dad Mountain. The temporal scope of impacts would include all phases of the Project, because it would remain visible until decommissioning and site reclamation activities are complete. Of the cumulative projects shown in Figure 3.1-1, this analysis assumes that the following projects could contribute incremental impacts to a synergistic cumulative impact on scenic vistas: the Stateline Solar Farm, Ivanpah Solar Electric Generating System, Silurian Valley Wind Project, Silurian Valley Solar Project, XpressWest High Speed Passenger Rail Project, and the Calnev Pipeline Expansion. Together, these projects would cause a substantial change in the character of views from I-15 from a predominantly natural landscape to industrial uses for much of the distance between the Nevada/California line to Barstow. This would be a significant cumulative effect.

Impact Vis-2: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on a scenic vista. (Significant and Unavoidable)

The County has considered the relatively low-profile nature of the Project relative to views of other projects in the cumulative scenario and nonetheless has determined that the Project's contribution to the significant cumulative effect to scenic vistas would be cumulatively considerable. For example, the visual resources analysis of the Ivanpah project, which is provided in Section 4.13 of the July 2010 Final EIS for that project (BLM, 2010b), describes multiple approximately 460-foot towers that would be lit day and night by an additional 5 to 10 feet of FAA-required strobe lighting, an approximately 92-foot-tall air-cooled condenser, 16-acre

substation, and other large, distinctly industrial features. Similarly, the Silurian Valley Wind Project proposes to construct up to 133 wind turbine generators, each of which would be approximately 400 to 480 feet tall at the maximum extension of the rotor blades and mounted on a reinforced concrete foundation (Pacific Wind, 2011). No further mitigation measures have been identified that would reduce the significance of the Project's contribution to cumulative effects such that it would be less than cumulatively considerable. The significant adverse cumulative impact to daytime views of scenic vistas would remain significant and unavoidable. Potential night sky effects are considered under criterion d, below.

b) The Proposed Action would not damage scenic resources within a state scenic highway. (No Impact)

There are no designated State Scenic Highways from which the Project would be visible (Caltrans, 2013). Therefore, construction, operation, maintenance, and decommissioning of the Project would have no impact with respect to damaging scenic resources within a state scenic highway. Because the Project would cause no impact to scenic resources within a state scenic highway, it could not cause or contribute to a cumulative effect in this regard.

c) Impact Vis-3: The Project would degrade the existing visual character or quality of the site and its surroundings. (Less Than Significant with Mitigation Incorporated)

Because the Project would be visible primarily from locations that also provide views of scenic vistas, potential impacts to the existing visual character or quality of the site and its surroundings are analyzed under criterion a. For the reasons described under criterion a, the impact of construction, operation and maintenance, and decommissioning of the Project on the visual character and quality of the site and its surroundings would be significant. However, as discussed above, with implementation of Mitigation Measures 3.18-2 (Construction), 3.18-3 (Operation and Maintenance), and 3.18-4 (Decommissioning and Site Reclamation), this impact would be reduced to less than significant.

Impact Vis-4: The Project would cause a cumulatively considerable contribution to significant adverse cumulative impacts on the existing visual character or quality of the site and its surroundings. (Significant and Unavoidable)

See the cumulative analysis described for criterion a: The rationale and conclusion provided there apply equally to consideration of the Project's incremental contribution to cumulative impacts to the existing visual character or quality of the Project site and its surroundings. No further mitigation measures have been identified that would reduce the significance of the Project's contribution to cumulative effects such that it would be less than cumulatively considerable. The Project's cumulatively considerable contribution to significant cumulative effects in this regard would remain significant and unavoidable.

d) Impact Vis-5: The Project would create a new source of light and glare that could adversely affect views in the area. (Less Than Significant with Mitigation Incorporated)

The Project would create a new source of light and glare that could adversely affect views in the area. The Project may require temporary lighting during construction and decommissioning and would require on-site nighttime lighting during operation and maintenance as described in Chapter 2. These light sources would be primarily concentrated at the site entrance and operation and maintenance building at the southwestern corner of the Project site and substation and switchyard southwest of the North Array on the western edge of the Project site. Some portable lighting also could be required for maintenance activities that must be performed at night. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required; and all lights would be hooded and directed to minimize backscatter and off-site light, as proposed by APM 43.

While the level of light generated by the Project is expected to be low, the Project would be in an area with few existing structures, with the exception of the service station at the Rasor Road interchange. Because of the undeveloped nature of the Project area and its surroundings, the presence of a large industrial facility requiring nighttime lighting would be considered a new source of substantial light or glare.

Daytime glare attributed to untreated bare-metal structures and PV panel surfaces associated with the Project could also contribute to the visual contrast of the Project in the environment. The use of PV technology is generally regarded as causing minimal glint and glare impacts. Solar PV employs glass panels that are designed to minimize reflection and reflect as little as 2 percent of the incoming sunlight (FAA, 2010). Nevertheless, some glare is possible from the surface of the PV panels and other Project components (especially metallic components) that reflect light depending on panel orientation, sun angle, viewing angle, and viewing distance. For example, Sullivan et al. (2010 as cited in DOI, 2010) observed glare from a slightly elevated viewpoint at a distance of approximately 2 miles from panels and ancillary components at a facility in Nevada. An example is shown in Figure 3.18-7.

Potentially affected observers would be travelers on I-15, users of the Rasor OHV area, visitors to Blue Bell Mine Road, and visitors to the Soda Mountains. It is possible that back reflected light or light not absorbed by Project facilities could produce minor glare, particularly when the viewer is positioned in line with the sun. This glare could occur in any one place for several hours (e.g., a sunny afternoon) but is unlikely to be visually distracting or nuisance causing. It is possible that glare produced by the Project would be more intense than any other natural or cultural features in an observer’s perspective. This could result in a significant impact. Implementation of Mitigation Measure 3.18-1, which requires measures to reduce glare and nighttime lighting effects, would reduce this potential impact to less than significant.

Impact Vis-6: Project-specific sources of light and glare would cause a cumulatively considerable contribution to significant adverse cumulative impacts relating to views, including views of the night sky, in the area. (Significant and Unavoidable)

The analysis of potential cumulative effects relating to light and glare considers the impacts of the Project in combination with those of other projects in the cumulative scenario (see Section 3.1.5 and Table 3.1-1) that, like the Project, would create new sources of light or glare that could combine with the effects of the Project. The temporal scope of potential cumulative effects would include all phases of the Project, from construction through decommissioning. Several of the cumulative projects shown in Figure 3.1-1 are expected to create new sources of light and glare, particularly including the Ivanpah Solar Electric Generating System and Silurian Valley Wind Project, which include multiple structures that would require FAA strobes or other safety lighting, and also including each of the other projects that would involve security or task lighting during its construction, operation, maintenance, or decommissioning. Collectively, the cumulative projects would cause a substantial change in the amount of light in the Project area. This would be a significant cumulative effect.

All artificial outdoor lighting necessary for the Project would be limited to basic safety requirements and shielded to the maximum extent possible to keep light on the intended subject and out of the night sky. Nonetheless, the Project's less-than-significant contribution to cumulative effects would by cumulatively considerable. No further mitigation measures have been identified that would reduce the significance of the Project's contribution to cumulative effects such that it would be less than cumulatively considerable. The significant adverse cumulative impact to views, including views of the night sky, would remain significant and unavoidable.

3.18.10.2 Alternative B

As analyzed in Section 3.18.6.2, the aesthetic impacts of Alternative B would be similar in nature, but reduced compared to those of the Proposed Action in proportion to its reduced footprint. However, the significance of Alternative B's impacts with respect to effects on scenic vistas, State Scenic Highways, the visual character and quality of the site, and light and glare would be the same as the Proposed Action, and Mitigation Measures 3.18-1 through 3.18-4 also would apply to this alternative. For the reasons discussed above, the cumulative impact of Alternative B would be substantially the same as that of the Proposed Action.

3.18.10.3 Alternative C

As analyzed in Section 3.18.6.3, the aesthetic impacts of Alternative C would be similar in nature, but reduced compared to those of the Proposed Action in proportion to its reduced footprint. However, the significance of Alternative C's impacts with respect to effects on scenic vistas, State Scenic Highways, the visual character and quality of the site, and light and glare would be the same as the Proposed Action, and Mitigation Measures 3.18-1 through 3.18-4 also would apply to this alternative. For the reasons discussed above, the cumulative impact of Alternative C would be substantially the same as that of the Proposed Action.

3.18.10.4 Alternative D

As analyzed in Section 3.18.6.4, the aesthetic impacts of Alternative D would be similar in nature, but reduced compared to those of the Proposed Action in proportion to its reduced footprint. However, the significance of Alternative D's impacts with respect to effects on scenic vistas, State Scenic Highways, the visual character and quality of the site, and light and glare would be the same as the Proposed Action, and Mitigation Measures 3.18-1 through 3.18-4 also would apply to this alternative. For the reasons discussed above, the cumulative impact of Alternative D would be substantially the same as that of the Proposed Action.

3.18.10.5 Alternative E: No Action/No Project

Under CEQA, Alternative E would not result in any impacts from Project construction, operation and maintenance, or decommissioning, because this alternative would not result in a change from existing conditions. Accordingly, it could not cause or contribute to any cumulative impact.

3.18.10.6 Alternative F: CEQA No Project

As described in Section 3.18.6.6, the increase in truck traffic under Alternative F would result in additional visual impacts due to the increased presence of trucks on and near the Project site. However, CEQA significance determinations would be the same as described above for the Proposed Action, or Alternative B, C, or D, depending on the alternative selected by the BLM, and the same mitigation measures would apply. For the reasons discussed above, the cumulative impact of Alternative F would be substantially the same as that of the Proposed Action and other action alternatives, respectively.

3.18.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under CEQA, Alternative G would not result in any impacts from Project construction, operation, maintenance, or decommissioning, because this alternative would not result in a change from existing conditions. Accordingly, it could not cause or contribute to any cumulative impact.

References

2M Associates, 2013. Soda Mountain Solar Project Visual Resource Technical Report.

BLM, 2013a. Old Spanish Trail. [http://www.blm.gov/ut/st/en/prog/blm_special_areas/national_scenic_and/olsp.html] Accessed August 14, 2013.

BLM, 2013b. Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands, First Edition. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/energy/renewable_references.Par.1568.File.dat/RenewableEnergyVisualImpacts_BMPs.pdf] The following reference from this report was used as a secondary source in this PA/EIS/EIR:

Sullivan, R., et al., 2012, "Visual Impacts of Utility-scale Solar Energy Facilities on Southwestern Desert Landscapes," Proceedings, National Association of Environmental Professionals, 37th Annual Conference, May 21–24, 2012, Portland, OR.

BLM, 2010a. Visual Resource Inventory, Bureau of Land Management, Barstow Field Office.

BLM, 2010b. California Desert Conservation Area Plan Amendment / Final Environmental Impact Statement for Ivanpah Solar Electric Generating System. July. Available online: [http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.19048.File.dat/1-CDCA-Ivanpah-Final-EIS.pdf]

BLM, 2006. Old Spanish National Historic Trail. [http://www.oldspanishtrail.org/assets/downloads/Barstow.pdf]

BLM, 1999. California Desert Conservation Area Plan of 1980, as amended.

BLM, 1986a. Manual H-8410-1, Visual Resource Inventory. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.31679.File.dat/H-8410.pdf]

BLM, 1986b. Manual 8431, Visual Contrast Rating. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.79462.File.dat/8431.pdf]

BLM, 1984. Manual 8400, Visual Resource Management. [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.34032.File.dat/8400.pdf]

California Department of Transportation (Caltrans), 2012. *2011 Traffic Volumes on California State Highways*. [http://traffic-counts.dot.ca.gov/index.htm] Accessed June 2013.

Caltrans, 2013. Scenic Highways San Bernardino County. [http://www.dot.ca.gov/hq/LandArch/scenic_highways/sberna.htm] Accessed July 25, 2013.

Federal Aviation Administration (FAA), 2010. Technical Guidance for Evaluating Selected Solar Technologies on Airports. November.

National Park Service (NPS), 2002. Mojave National Preserve General Management Plan.

Pacific Wind, 2011. Plan of Development Silurian Valley Wind Project. May.

San Bernardino County, 2013. County of San Bernardino 2007 General Plan. [http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP61813.pdf]

U.S. Department of the Interior (DOI), 2010. BLM and Department of Energy, Draft Programmatic Environmental Impact Statement Solar Energy Development in Six Western States, (December, 2010). The following reference from this report was used as a secondary source in this PA/EIS/EIR:

Sullivan, R.G., et. al., 2010. Visual Characteristics of Utility-Scale Solar Energy Facilities: Field Observation Report, in press.

Wilson Geosciences, 2011. Geologic Characterization Report for the Proposed Caithness Soda Mountain Solar Facility near Baker, San Bernardino, California. Prepared by Ken Wilson, Wilson Geosciences, Inc., for RMT, Inc., and Caithness Soda Mountain, LLC.

3.19 Water Resources

3.19.1 Introduction

This section describes the existing surface and groundwater hydrology and water quality conditions in the Project area that could be affected by the proposed Project construction, operation and maintenance, and decommissioning. Also described here are the existing laws and regulations applicable to potentially affected water resources. The current condition and quality of these water resources was used as the baseline against which to assess and describe the potential effects of the Proposed Action and alternatives. Because pollutants can be transported downstream or downgradient to sensitive receiving waters, the effects of Project implementation on downstream receiving waters also were considered. In some cases, compliance with existing laws and regulations would serve to reduce or avoid certain effects that otherwise might occur.

3.19.2 Regional and Local Environmental Setting

The Project is located in the desert area of San Bernardino County. The desert area is an assemblage of mountain ranges interspersed with long, broad valleys that often contain dry lakes, the terminus of surface water drainage basins. Many of these mountains rise from 1,000 to 4,000 feet above the valleys. Due to the persistent winds that blow throughout the year, large portions of the desert surface have been modified into a mosaic of pebbles and stones known as desert pavement. A major water resource of the region is the Mojave River. The Mojave River travels north and east away from its source headwaters in the San Bernardino Mountains. The Mojave River generally ends its surface flow at Soda Dry Lake south of the town of Baker. The majority of the Mojave River is characterized by a dry riverbed that only on occasion reveals the water normally flowing beneath the riverbed (San Bernardino County, 2011). Short reaches of the Mojave River, such as Afton Canyon, are perennial and represent where the Mojave River Aquifer is forced to the surface by less permeable underlying rock formations (San Bernardino County, 2011).

The Project site lies south and west of Baker within an undeveloped intermontane desert valley composed of alluvial fan deposits and surrounded by the Soda Mountains (Soda Mountain Solar, LLC, 2012). Elevations in the Project area range from approximately 1,550 feet in the north to 1,250 feet in the southeast. The Soda Mountains north and west of the Project area reach an elevation of approximately 3,600 feet. Lower mountains to the south and east of the Project area form a discontinuous border reaching elevations of approximately 2,400 feet.

3.19.2.1 Climate and Precipitation

The region has a typical desert climate characterized by extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. Summer high temperatures in the desert area typically exceed 100 degrees Fahrenheit. Winter temperatures are more moderate, with mean maximum temperatures in the 60s and lows in the 30s. The valleys between mountain ranges experience very high temperatures, while the adjacent mountains often experience much

cooler temperatures, particularly at their summits. The differences in elevation and topography are in part responsible for variations in temperature and precipitation.

Most of the precipitation occurs between December and March. However, occasional heavy precipitation occurs in the summer due to monsoonal like rain events. With the possible exception of some of the higher elevations in the mountains, precipitation throughout the Desert area is typically less than 4 inches per year, usually of short duration and high intensity. The resulting flash floods rapidly modify the terrain that is exposed to the erosive surface runoff. Unusually heavy or persistent rains often result in the temporary filling of a number of dry lakes in the region until the surface water evaporates or infiltrates the subsurface. Persistent winds blow throughout the year. (San Bernardino County, 2011)

The average annual precipitation in the nearby Soda Lake Basin ranges from 3 to 5 inches (DWR, 2003), but is higher in the surrounding mountains. The mountainous portion of the Project vicinity is estimated to receive an annual average of 4.855 inches per year (Panorama Environmental, Inc., 2013a). The town of Baker, 6 miles northeast of the Project area, has an annual average rainfall of 4.10 inches per year and maximum monthly recorded precipitation of 3.43 inches (RMT, Inc., 2011a). Baker is located in an area lower in elevation than the Project site (elevations in Baker range from about 950 to 1,000 feet and in the Project area range from 1,250 to 1,550 feet). The difference in the estimated average rainfall between Baker and the Project site is attributed to the difference in elevation and topography between the two areas (Panorama Environmental Inc., 2013a).

3.19.2.2 Surface Water Hydrology, Drainage, and Flooding

The Project site is located within the Soda Lake Watershed. The Soda Lake Watershed is a watershed within the Mojave Sub-Basin (Figures 3.19-1 and Figure 3.19-2), which includes the Mojave River, Mojave River Wash, Soda Lake, and Silver Lake. Soda Lake and Silver Lake are desert basins with no outlet that periodically fill with water after a storm event to form temporary lakes. The Mojave River Watershed encompasses approximately 4,500 square miles and is located entirely within San Bernardino County. The primary geographic and surface hydrologic feature of the watershed is the Mojave River. The Mojave River channel transects the watershed for approximately 120 miles until it reaches Silver Lake near the community of Baker. Much of the Mojave River flow is underground in the confined riverbed channel. The Mojave River channel is typically dry downstream of the Mojave Forks Dam except in select locations where groundwater is forced to the surface by geologic structures (San Bernardino County, 2003). Water quickly percolates into the porous sands of the Mojave River bed. Soda Lake, south of Baker, periodically is supplied with water during rare winter storm events, when the Mojave River flows past Barstow, through the Mojave Valley, and through Afton Canyon to Soda Lake (RMT, Inc., 2011a; 2011b). During periods of exceptional rainfall, Soda Dry Lake will overflow into Silver Dry Lake, north of Baker (Figure 3.19-2). At its closest approach, the Mojave River flows approximately 3 miles to the east of the Project area.

The Project site is located in the valley portion of the Soda Lake Watershed (Figure 3.19-2), which is composed of both gently sloping valleys surrounded by steeper mountainous areas. Project area terrain consists of predominantly south- to east-sloping (at 2 to 4 percent) alluvial

deposits (RMT, Inc., 2011c). Alluvium is an unconsolidated sedimentary deposit derived from weathering, erosion, and transport and deposited by a stream or other body of running water. As stream flow exits from canyons in upper watersheds, it spreads out like a fan and sediment settles out to build up the fan area. As the flow spreads out, its velocity slows down with the increasing surface area forming fan-shaped wedges of predominantly sand, gravel, cobbles, and boulders.

The mountainous areas upgradient of the Project site have distinct channels caused by erosive forces over time. Downgradient of the mountain front, the landscape is dominated by alluvial fans, with braided channels created by major storm events (RMT, Inc., 2011a). Soda Lake and Silver Lake are located east and northeast of the Project Area, respectively, and Cronese Lake and watershed is west of the Project site, across a surface water divide (RMT, Inc., 2011b). There are no perennial water sources within the Project area or surrounding valleys, with one exception (Soda Mountain Solar, LLC, 2012). The closest year-round surface water feature is Soda Spring, on the west side of Soda Lake and the east slope of the Soda Mountains. Soda Spring is approximately 4 miles east of the Project area (Figure 3.19-3) and is separated from the Project site by the eastern Soda Mountains (Soda Mountain Solar, LLC, 2012).

Topography and Surface Water Drainage

The valley in which the Project area is located is surrounded by low mountains, with broad alluvial fans overlying the bedrock along the mountain fronts (RMT, Inc., 2011b). The valley is characterized by steeply sloping alluvial sediments in the upper reaches of the alluvial fans gradually leveling off as they approach the floor of the valley. Sediments will likely be coarser and, therefore, more permeable at higher elevations, closer to the mountain front, than at lower elevations. A large watershed exists upgradient of the Project area to the west and north contributing the majority of surface drainage within the Project area. Surface drainage occurs through braided channels, shallow flow, and overland sheet flow runoff. Water draining from the Soda Mountains during rain events is conveyed through the Project area through a series of these unnamed braided desert washes. Ephemeral drainages are present throughout the Project area. Surface drainage flows predominantly east and southeast from the main Soda Mountains mass in the west, and is interrupted at I-15, where drainage is directed to several culverts that pass under the freeway. Surface water is only available within the Project area during and shortly after rain events (Soda Mountain Solar, LLC, 2012). Historical migration of drainage channels across the Project area was evaluated through a review of historical aerial photos dating from 1953 to the present. Review of these photos indicates that drainage across the Project area has changed very little over the past 50-plus years (RMT, Inc., 2011c).

The valley includes two drainage basins, Basin A (north) and Basin B (south), (Figure 3.19-2) that encompass a combined area of approximately 32,946 acres (51 square miles). There are two ephemeral surface water outlets to the valley, located northeast and southeast of the Project Area (Figure 3.19-2). I-15 bisects both basins A and B within the Project site, acting as a structure that collects and redirects the historic stormwater runoff flow patterns that existed before the interstate was constructed into several culverts that pass under the freeway (RMT, Inc., 2011a; Wilson Geosciences, 2011) (Figure 3.19-4). During storm events, precipitation runoff from Basin A in the northern portion of the drainage basin is funneled into the northeast surface water outlet along the north side of I-15. Runoff from Basin B in the southern portion of the basin flows through an

outfall that exits the site to the southeast (RMT, Inc., 2011a). Basin A outfalls into Soda Lake after crossing I-15, just east of the Zzyzx Road exit. Basin B outfalls into the Mojave River Wash and Soda Lake (RMT, Inc., 2011a). A drainage divide is present at the junction of these two main washes east of I-15 at approximately elevation 1,370 feet (Wilson Geosciences, 2011). To a lesser extent, additional drainage flows from the bounding lower mountains on the south, east, and north.

Flooding and Erosion

The Project site has not been classified by the Federal Emergency Management Agency (FEMA) as a Flood Hazard area, and the site has not been mapped by FEMA. The Project site is classified as Zone D by FEMA, "Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted." The County also has not designated the Project site as a Flood Hazard area, and the nearest mapped Flood Hazard areas are Soda Lake and Silver Lake (San Bernardino County, 2010).

The Project site is located on Quaternary alluvial deposits that vary in age from recent (decades to millennia) to very old (tens of thousands of years), with the older deposits forming the more elevated surfaces (for detailed discussion of soils, see Section 3.7, *Geology and Soil Resources*). Alluvium is generally a mixture of gravel, sand, and silt deposited by water. The heavier gravel tends to deposit on steeper slopes (near local mountains), whereas silt and sand tends to deposit on the flatter terrain that is more prevalent in the lower valley areas. The majority of the Project area is composed of very old deposits. Active washes cut through these older deposits and are characteristic of recent deposition. These recent deposits are also the areas of high erosion and flood potential, and can be unstable (RMT, Inc., 2011a).

The surface soils of the Project site are generally covered with sandy and gravelly soils. The percentage of gravel-sized and larger particles ranges from approximately 10 to 50 percent, and the percentage of fine-grained silts or clays ranges from 5 to 20 percent (Section 3.7).

A Geologic Field Reconnaissance Report (RMT, Inc., 2011c) prepared for the Project included investigation of scour and infiltration potential in the Project area and at locations of existing culverts along I-15. Field reconnaissance included observations with respect to lithology, presence of cemented soils, stratigraphy and morphology of the sedimentary deposits, approximate channel cut depth, and steepness of channel cut slopes. In addition, the presence of desert varnish, desert pavement, and vegetation were recorded. Desert varnish or desert polish is a black or red patina on stable rock surfaces created by accumulation of a combination of clay and microbes that oxidizes the manganese (to create black varnish) or iron (to create red varnish) in the clay. Red varnish is prevalent in highly arid areas such as the Mojave Basin. Desert pavement is a natural assemblage of relatively large, closely packed and interlocking rock clasts (pebbles, cobbles, etc.) that have been cemented and exposed to the effects of solar radiation and wind over time. It can generally be characterized as having carbonate cement, or caliche, in the A soil horizon. The presence of desert pavement is an indication of an older, stable surface that has not been recently eroded. The presence of established, mature vegetative cover along an incised channel bank is an indication that the channel is relatively old, thus giving time for soil to develop and for plants to establish roots in the sediments (RMT, Inc., 2011c).

An assessment of erosion and scour in the Project area included a field study of scour conditions in existing channels, and a visual analysis of degree of erosion outside of existing channels. The channel study included observations and measurements that were recorded at four I-15 culvert locations (RMT, Inc., 2011c). Excessive scour at I-15 culverts was not identified.

Stormwater runoff within the Project area causes ongoing scour and erosion, both vertical and lateral. High runoff and discharge velocities are capable of transporting substantial sediment volumes, including large boulders. At each I-15 crossing, both vertical and lateral scour and erosion are partially controlled by the culvert structures, and sediment has accumulated within the culverts, partially filling them. Therefore, potential channel migration, scour, and erosion within the Project area on the southeast side of I-15 (downstream of the culverts) are generally reduced by these manmade structures (RMT, Inc., 2011c). Figure 3.19-5 provides an overview of flood and erosion potential at the Project site based on this site specific investigation (Wilson Geosciences, 2011).

3.19.2.3 Groundwater

The Project site is located in the upland Mojave Desert region of the South Lahontan Hydrologic Region within the Soda Lake Valley Groundwater Basin, near the intersection of the Silver Lake Valley Groundwater Basin and the Cronese Valley Groundwater Basin (DWR, 2003; RMT, Inc., 2011a). The South Lahontan Hydrologic Region includes 76 groundwater basins. Much of this hydrologic region is public land with very low population density. Within these areas, there has been little groundwater development and little is known about the basins (DWR, 2003).

The 381,000-acre Soda Lake Valley Groundwater Basin (Basin No. 6-33; DWR, 2003) is located in a valley in northeast San Bernardino County (Figure 3.19-6). The basin is bounded by the Mark and Kelso Mountains on the east, the Bristol and Cady Mountains on the south, the Soda and Cave Mountains on the west, and a low divide with the Silver Lake Basin on the north. These areas drain towards Soda Lake and Silver Lake (Panorama Environmental, Inc., 2013a). The regulated (upper) Mojave River Basin also drains into Soda Lake along with inferred associated groundwater flow. Overall groundwater flow out of Soda Lake is inferred to move north/northwest, through Silver Lake and possibly into Death Valley. (Bedinger, et al, 1984) The Project site is located in the west portion of the basin, surrounded by the Soda Mountains. It is tributary to the overall groundwater flow out of Soda Lake. Basin No. 6-33 has not been adjudicated and overdraft[1] conditions within the basin have not been identified (DWR, 1980; Panorama Environmental, Inc., 2013a). No Urban Water Management Plan or other groundwater management plan has been adopted for Basin No. 6-33 or the subbasin in which the Project is proposed (Panorama Environmental, Inc., 2013a).

In the South Lahontan Hydrologic Region groundwater typically occurs in unconfined alluvial aquifers ranging from tens to hundreds of feet thick (RMT, Inc., 2011a). In most smaller basins, groundwater is found in unconfined alluvial aquifers; however, in some of the larger basins, or

[1] Defined in the San Bernardino County's Desert Groundwater Management Ordinance and used for calculation of safe yield by Panorama Environmental, Inc. (2013a) as "(t)he condition of a groundwater supply in which the average annual amount of water withdrawn by pumping exceeds the average annual amount of water replenishing the aquifer in any ten year period, considering all sources of recharge and withdrawal."

near dry lakes, aquifers may be separated from the ground surface and/or from each other by aquitards that cause confined groundwater conditions (DWR, 2003). Depths of the basins range from tens or hundreds of feet in smaller basins to thousands of feet in larger basins. Well yields vary in this region depending on aquifer characteristics and well location, size, use, and age (DWR, 2003). Quaternary alluvium is the major water-bearing unit in Soda Lake Basin and is present to a maximum thicknesses of 400 feet (DWR, 2004). The sediments of the Project site are characterized as unconsolidated, poorly bedded gravel, sand, and silt underlying relatively steep alluvial fans bordering the fronts of the adjacent mountains (USGS, 1955). The sediments are estimated to be "moderately to poorly water-yielding" with relatively thin saturated water zones (USGS, 1955).

Soda Mountain Subbasin

The Project is located within a subbasin of the Soda Lake Valley Groundwater Basin (area outlined in blue in Figure 3.19-6). The subbasin generally is separated from the rest of Basin No. 6-33 by mountains to the south and east (Soda Mountain Solar, LLC, 2012; Panorama Environmental, Inc., 2013a). The potential for groundwater to be present beneath the Project area is high due to the upslope watershed and surface drainages into the basin, the annual rainfall in the area, the relatively rapid infiltration rates for the surficial deposits, and the general characteristic of subsurface coarse-grained alluvial materials to retain (porosity) and transport (permeability) subsurface water (Wilson Geosciences, 2011).

The direction of groundwater flow within the subbasin is expected to generally mimic the slope of the surface topography. Groundwater flow in the northern Basin A is expected to be south, then east toward and through a bedrock gap in the Soda Mountains, continuing to Soda Lake to the east (TRC, 2013). Groundwater flow in the southern Basin B is expected to be south, then east toward the terminus of the Mojave wash to the southeast (TRC Solutions, 2013; Soda Mountain Solar, LLC, 2012; Panorama Environmental, Inc., 2013a). Geologic mapping indicates that the alluvium in the subbasin is surrounded by volcanic and granitic geologic units (Figure 3.19-7). These geologic units are believed to be relatively impermeable, although fractures may allow some limited groundwater permeability (Panorama Environmental, Inc., 2013a). Because the subbasin is surrounded by mountains, groundwater likely flows from the subbasin to the remainder of Basin No. 6-33 through the aforementioned bedrock gaps in the mountains to the northeast and southeast (Figure 3.19-6).

The subbasin is topographically higher than areas to the east (RMT, Inc., 2011b). Groundwater elevations within the subbasin estimated from geophysical data are approximately 150 to 300 feet higher than those measured by the U.S. Geological Survey (USGS) in Basin No. 6-33 (Panorama Environmental, Inc., 2013a). Specifically, the estimated[2] elevation of groundwater for the Project area is 1,232 to 1,170 feet amsl in the subbasin, while groundwater elevations outside the subbasin measured by the USGS at wells located near the eastern end of Rasor Road (Figure 3.19-3) lower in Basin No. 6-33 range from 945 feet to 958 feet amsl. Similarly, Soda Spring is located on the bank

[2] Groundwater depth estimates were derived from Transient Electromagnetic soundings conducted within the Project area to delineate vertical changes in geologic formation electrical resistivity to depths of at least 350 feet to aid in selecting a potential water well investigation site (Wilson Geosciences, 2011).

of Soda Lake within Basin No. 6-33 at an elevation of approximately 948 feet amsl. It is associated with an outcrop of carbonate rock and an inferred fault. Either the rock type or faulting could be a significant factor in the spring's existence.

Subbasin Geology

The Soda Mountain subbasin is approximately 32,946 acres (51 square miles) in size. Geologic mapping indicates that the Project area overlies alluvium, which is the primary water-bearing geologic unit in the subbasin (Panorama Environmental, Inc., 2013a). This finding was preliminarily confirmed by geophysical and geotechnical data collected in the Project area (RMT, Inc., 2011b; 2011c). The alluvium within the subbasin covers an area of approximately 12,632 acres (19 square miles) across the lower elevations of the valley (Figure 3.19-7). The average thickness of the alluvium, as estimated from site specific geophysical data, is approximately 423 feet (Panorama Environmental, Inc., 2013a). The remaining 20,314 acres (32 square miles) within the subbasin consist of the mountains surrounding the valley.

Subbasin Storage

Subsurface geologic conditions within the subbasin were evaluated using the results of the geophysical studies performed in the Project area (Panorama Environmental, Inc., 2013a; RMT, Inc., 2011b). The results indicate that the depth to bedrock in the northern portion of the aquifer is approximately 332 feet below ground surface (bgs) ±26 feet, and the water table is present within the alluvium at a depth of approximately 182 feet bgs ±13 feet (Panorama Environmental, Inc., 2013a). In the southern portion of the aquifer, depth to bedrock was estimated to be at least 500 feet bgs and the water table is present within the alluvium at approximately 354 feet ±30 feet or deeper (Panorama Environmental, Inc., 2013a). The aquifer is unconfined, as determined from available geotechnical boring and geophysical data.

The storage volume of the subbasin was estimated by multiplying the total volume of the aquifer by a reasonable estimate of specific yield for the basin. The acreage of the alluvium is 12,632 acres, the average thickness of the saturated alluvium (as estimated from the geophysical sounding results) is approximately 99 feet, and the specific yield of the aquifer is estimated at 0.1 (RMT, Inc., 2011b). The storage of the subbasin thereby is estimated to be approximately 125,000 acre-feet.

Subbasin Recharge

Recharge for the area primarily occurs as runoff from the surrounding mountains onto alluvial fan deposits of the surrounding valleys. In arid and semiarid climates, the most significant component of recharge to basin aquifers is thought to occur along the mountain front. Traditionally called "mountain-front recharge," this process describes the contribution of mountainous to the recharge of aquifers in adjacent basins (Wilson and Guan, 2004). In general, mountain-front recharge estimates are based on the general precipitation characteristics of the local mountains or by calibration of a basin groundwater flow model. Basin aquifer recharge in arid basins is typically focused along stream channels and the mountain front; in many cases mountain-front recharge is the dominant source of replenishment (Wilson and Guan, 2004).

Many studies have been conducted to determine mountain-front recharge (Panorama Environmental, Inc., 2013a). A 2004 study (Wilson and Guan) included an analysis of quantitative assessments of

mountain-front recharge using multiple methods. Recharge rates ranged from 38 percent for highly permeable rock to 0.2 percent for a system where recharge was dominated by streamflow. In systems similar to the project area and consisting of weathered and fractured granitic rock and metamorphic rock, recharge ranged from 7.8 to 8.8 percent (Panorama Environmental, Inc., 2013a). Studies within the Mojave Basin and Death Valley found that 10 percent of runoff becomes recharge (Panorama Environmental, Inc., 2013a). An estimate of 7.8 percent for mountain-front recharge is comparable to the value of approximately 10 percent of runoff becoming recharge in the Mojave Desert and is assumed for the Soda Mountain subbasin as a conservative estimate based on the results of these studies (Panorama Environmental, Inc., 2013a).

To determine recharge, precipitation data for the Project area were obtained from the PRISM Climate Group (Oregon State University) and overlain on the bedrock portions of the subbasin (Panorama Environmental, Inc., 2013a). Only bedrock areas were considered for recharge because valley floor precipitation does not contribute significantly to recharge. The 20,314-acre mountainous portion of the subbasin receives approximately 4.855 inches (0.405 foot) of rain annually (based on a weighted average over the elevation ranges represented), which equates to 8,219 acre-feet per year (AFY) of precipitation. Using a recharge rate of 7.8 percent, the WSA estimated mountain-front recharge at 641 AFY (Panorama Environmental, Inc., 2013a).

The Soda Mountains subbasin is geographically and topographically isolated and does not receive much, if any, inflow from adjacent groundwater basins. Consequently inflow/outflow from the basin was not included in estimates of groundwater availability or recharge (Panorama Environmental, Inc., 2013a). Based on BLM staff's experience elsewhere in arid and semi-arid regions of southern California, recharge rates ranging from 3 percent to 10 percent of precipitation are a reasonable range. Assuming this range for rates of recharge, the low-end (3 percent) and high-end (10 percent) recharge rates result in a total input of 376 to 1,330[3] AFY of recharge (TRC Solutions, 2013).

Groundwater Use

Municipal and irrigation well yields in the Soda Lake Valley Basin are the highest among the three basins, averaging 1,100 gpm, with a maximum of 2,100 gpm, whereas yields in the Cronese Valley Basin average 340 gpm, with a maximum of 600 gpm (DWR, 2003). No well yield estimates are available for the Silver Lake Valley Basin. Depth to water data range from 7 to 25 feet bgs for wells in Soda Lake Valley Basin, from 18 to 52 feet bgs in Cronese Valley Basin, and from 4 to 77 feet bgs in Silver Lake Valley Basin. As discussed above, a greater depth to the water table is expected in the Project area, because it is in an upland area that is farther from local discharge zones such as the area dry lakes (RMT, Inc., 2011a).

No wells currently are known to be within the Project area. Four wells are located within 5 miles of the Project area. These are shown on Figure 3.19-3 and include:

[3] Total inputs from recharge based on the 3 to 10 percent range for recharge is based on specific model parameters used for assessing groundwater impacts (TRC Solutions, 2013) as detailed in Appendix H.

1. The Rasor Road service station well located on the gas station property at the Rasor Road exit from I-15.
2. Wells 012N008E27N002A and 012N008E35A001S (identified in the USGS National Water Information System database), located 4 and 4.5 miles southeast of the Project area, respectively, on Rasor Road.
3. The Desert Studies Center well located near Soda Spring on the west shore of Soda Lake.

The Soda Mountain subbasin aquifer is not currently in a state of overdraft, nor is it projected to be (Soda Mountain Solar, 2012; Panorama Environmental, Inc., 2013a). This is largely based on an evaluation that there is very limited current usage and there are no planned future uses of groundwater within the subbasin other than the Project (Panorama Environmental, Inc., 2013a). The only existing groundwater use in the Soda Mountain subbasin is the groundwater well installed at the Rasor Road service station near the southwest corner of the proposed southern array (Figure 3.19-3). The well at the Rasor Road service station is a 760-foot-deep water supply well screened in bedrock that is hydrologically separated from the saturated alluvium in the valley (RMT, Inc., 2011b). Reports of yields from this well range from just 1,500 gpd (1.7 AFY) (RMT, Inc., 2011a) to 10 to 12 gpm (16 to 19 AFY) (Panorama Environmental, Inc., 2013a). Groundwater withdrawal at the Rasor Road service station would be expected to remain constant due to the limited well productivity. Sediments in the center of the Project area are believed to be significantly thicker than at the Rasor Road area, based on topography and distance to the nearest bedrock outcrops. A greater thickness of sediments increases the potential of encountering a higher yielding aquifer. There are no other uses of groundwater within the subbasin. The next closest water supply well outside the Project area is approximately 4 miles southeast of the Project's southern boundary, where the water table is close to the surface, and the well reportedly yields an ample supply of water (Caithness Soda Mountain, LLC, 2011). This location is lower in elevation than the Project area, and appears to be in the ephemeral stream bed of the Mojave River Wash (Caithness Soda Mountain, LLC, 2011).

3.19.2.4 Groundwater Quality

The chemical character of the groundwater varies throughout the South Lahontan Hydrologic Region, but most often is dominated by calcium or sodium bicarbonate (DWR, 2003). Near and beneath dry lakes, sodium chloride and sodium sulfate-chloride-rich water is common. In general, groundwater near the edges of valleys contains lower total dissolved solids (TDS) content than water beneath the central part of the valleys or near dry lakes (DWR, 2003). Drinking water standards are often exceeded due to high TDS, fluoride, and boron contents. The USEPA lists 13 sites of contamination in this hydrologic region. Of these, three military installations in the Antelope Valley and Mojave River Valley groundwater basins are federal Superfund sites because of volatile organic chemicals and other hazardous contaminants (DWR, 2003). None of these sites are located within or upgradient of the Project area.

The Desert Studies Center (Center) is located along Zzyzx Road on the west side of Soda Lake, southeast of the Project site. The Center is separated from the Project site by the Soda Mountains and is therefore outside of the Soda Mountain subbasin. A well located at the Center was sampled in May 2000 and TDS were quantified at 1,890 milligrams per liter (mg/L) (Soda Mountain

Solar, LLC, 2012). The data for the Center well are provided here because there are limited water quality data available for the Project area. Several USGS wells are present in the region surrounding the Project site, although none are located within the Soda Mountain subbasin.

Soda Mountain Subbasin Groundwater Quality

Limited groundwater quality data are available for the Project site due to the absence of wells in the valley. There are no groundwater wells within the alluvial portions of the Soda Mountain subbasin and no groundwater sampling has been conducted within the aquifer (Soda Mountain Solar, LLC, 2012). There are no known hazardous materials sites in the Soda Mountain subbasin. The only intensive land use within the basin that may affect water quality is the I-15. Vehicle pollutants are unlikely to have a substantial effect on groundwater quality due to the depth to groundwater within the basin (Soda Mountain Solar, LLC, 2012). Water quality at the Rasor Road service station well, which is screened in bedrock (Caithness Soda Mountain, LLC, 2011) and hydrogeologically separated from the saturated alluvium of the valley, has TDS concentrations of approximately 3,000 mg/L and requires use of a reverse osmosis system to produce potable water (RMT, Inc., 2011b; Panorama Environmental, Inc., 2013a).

In September 2010, a geophysical survey (RMT, Inc., 2011b) collected subsurface resistivity data that were used to estimate water quality (Soda Mountain Solar, LLC, 2012). Resistivity is the inverse of conductivity. Conductivity is directly correlative to TDS (i.e., higher conductivity is indicative of higher TDS and, conversely, lower resistivity is also indicative of higher TDS). Data from the geophysical investigation indicate that the resistivity of the saturated subsurface differs between the northern and southern portions of the valley, consistent with the interpretation of different groundwater flow directions in the two portions of the valley (RMT, Inc., 2011b), as discussed above. Groundwater at the northern end of the Project site has very low resistivity (4 ohm-meters), indicating a high conductivity and a high concentration of TDS. Groundwater in the southern portion of the Project site has slightly higher resistivity values (15 ohm-meters), indicating relatively high TDS concentrations but lower than at the northern location (Soda Mountain Solar, LLC, 2012). TDS values for Project well water are anticipated to be in the range of 800 to 1,200 parts per million, based on the pattern of TDS values in the surrounding area (RMT, Inc., 2011a). As described in Chapter 2, a water quality sample would be collected from the proposed test well and analyzed for TDS by a State of California-certified laboratory. The need for an RO facility to treat groundwater would be based on the test results.

3.19.3 Applicable Laws, Regulations, Plans, and Standards

3.19.3.1 Federal

Jurisdictional Areas

Ephemeral dry washes are defined by shelving and/or scour resulting in an established bed, bank, and channel. Such features on the Project site are not regulated by the U.S. Army Corps of Engineers (USACE) due to their isolated nature (USACE, 2013). They are, however, subject to California Department of Fish and Wildlife (CDFW) and State Water Resources Control Board (SWRCB) jurisdiction as Waters of the State. For more detailed discussion of Waters of the State

in the Project area and the area of ephemeral dry washes subject to direct disturbance from proposed activities, see Section 3.3.2.4.

Clean Water Act

In 1972, the Clean Water Act (CWA, 33 USC 1251-1376) established the basic structure for regulating discharges of pollutants into the Waters of the United States and gave the USEPA the authority to implement water pollution control programs. The CWA sets water quality standards for contaminants in surface waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways and to manage polluted runoff. While no Waters of the United States occur on the Project site, in California, the USEPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and programs that minimize adverse impacts relating to construction site stormwater runoff, to the SWRCB and the nine Regional Water Quality Control Boards (RWQCBs). Water quality regulations and standards applicable to the Project are discussed further under the discussion of state regulations, below.

Executive Order 11988 and the Federal Emergency Management Agency

Under Executive Order 11988, FEMA is responsible for management of floodplain areas. FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e., the 100-year flood event).

California Desert Conservation Area Plan

The CDCA Plan and multiple-use classes applicable to the Project site are described in Section 3.9, Lands and Realty. Specifically with respect to water resources, the CDCA Plan requires that areas designated Multiple-Use Class L be managed to provide for the protection and enhancement of the surface and groundwater resources, except for instances of short-term degradation caused by water development projects. For areas designated Class M or I, the CDCA Plan requires management to minimize the degradation of water resources. For all areas, best management practices (BMPs) developed by the BLM shall be used to avoid degradation and to comply with Executive Order 12088, which requires all federal agencies to be in compliance with environmental laws and fully cooperate with USEPA, state, interstate, and local agencies to prevent, control, and abate environmental pollution.

3.19.3.2 State

Senate Bill 901, 610, and 267, Water Supply Assessment

Senate Bill (SB) 901 was enacted in 1995 to ensure that cities and counties assess the adequacy of available water supplies to meet projected water demand prior to approving certain types of new

land development projects. SB 901, also known as the WSA law, requires that before a project is granted approval, the city or county must request preparation of a WSA by the public water supplier that will serve the proposed project. The provisions of SB 901 were codified in Water Code Sections 10910 through 10915.

SB 610 was enacted in 2001 to improve the WSA process and expand the scope of development projects triggering the WSA procedure. The primary goal of SB 610 was to improve the linkage between water use and land use planning to ensure that land use decisions for specific large development projects have adequate information to assess whether sufficient water supplies are available to meet project demands. The 2001 bill also required additional information with respect to groundwater supplies. In 2011, SB 267 was enacted to revise the definition of a project to include new renewable energy projects. Section 10912(a)(7)(B) of the Water Code specifies that a proposed photovoltaic generation facility is not a "project" subject to the provisions of SB 610 if the facility would demand no more than 75 acre-feet of water annually.

During all Project phases, potable water would be trucked in from off-site and is not included in estimates of groundwater consumption. The operational non-potable water demand for the Project is estimated to be 31.4 AFY. The Project's construction non-potable water demand is estimated to be 192 AFY for three years Because the Project's annualized non-potable water demand is approximately 46 AFY over 33 years, it demands less than 75 acre-feet of water annually and is not subject to the provisions of SB 610. A WSA nonetheless has been prepared to assist the BLM and the County in evaluating potential water supply impacts (Panorama Environmental, Inc., 2013a, included as Appendix H-1).

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while each of the nine RWQCBs conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish a regional basin plan with water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional basin plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the state, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans. The basin plan for this location is discussed below in the local regulations subsection.

Lahontan Regional Water Quality Control Board

On the regional level, the Project falls under the jurisdiction of the Lahontan RWQCB (LRWQCB), which is responsible for the implementation of state and federal water quality

protection statutes, regulations, and guidelines. The LRWQCB adopted, and the SWRCB approved, the Water Quality Control Plan for the Lahontan Region (Basin Plan) to define how the quality of surface water and groundwater in the region should be managed to provide the highest water quality as reasonably possible. The Basin Plan lists the various beneficial uses of water within the region; describes the water quality which must be maintained to allow those uses; describes the programs, projects, and other actions which are necessary to achieve the standards established in this plan; and summarizes plans and policies to protect water quality. Beneficial water uses are of two types: consumptive and non-consumptive. Consumptive uses are those normally associated with human activities, primarily municipal, industrial and irrigation uses that consume water and cause corresponding reduction and/or depletion of water supply. Non-consumptive uses include swimming, boating, waterskiing, fishing, hydropower generation, and other uses that do not significantly deplete water supplies. Beneficial uses associated with the Soda Lake Hydrologic Subarea in the vicinity of the Proposed Action are described for Soda Lake and for the Mojave River. These beneficial uses include municipal and domestic supply (MUN); agricultural supply (AGR); groundwater recharge (GWR); water contact recreation (REC-1); non-contact water recreation (REC-2); cold freshwater habitat (COLD); wildlife habitat (WILD); and water quality enhancement (WQE).

The Project area drains eastward toward the Mojave River. The Project is not subject to federal jurisdiction under the CWA due to the isolated nature of the waters on the site, because the project area does not drain to a water of the U.S., and because the ephemeral washes qualify as Non-Relatively Permanent Waters. There is no interstate commerce use of the waters within the watershed or downstream and therefore no nexus to federal jurisdiction (USACE, 2013). Because there are no Waters of the U.S. present on the Project site, the CWA and consequently the State National Pollutant Discharge Elimination System (NPDES) program and Construction General Permit (Order No. 2009-0009-DWQ) with associated Storm Water Pollution Prevention Plan (SWPPP) requirements do not apply, regardless of the size of disturbance.

However, Waters of the State are present on the Project site in the form of desert washes (Figure 3.3-2). The state has jurisdiction over activities that occur in Waters of the State subject to Porter-Cologne. The Applicant will be required to obtain a permit for dredge and fill (described below) for the Project due to installation of posts and grading in the Waters of the State (drainages). The LRWQCB will require that a SWPPP or BMP Plan (similar to a SWPPP) be prepared as a part of the dredge and fill permit. Monitoring and reporting will also be required.

General Permit R6T-2003-004

General Permit R6T-2003-004, General Waste Discharge Requirements for Small Construction Projects, including Utility, Public Works, and Minor Streambed/Lakebed Alteration Projects throughout the Lahontan Region, Excluding Lake Tahoe, regulates construction activity and may be used to regulate dredged and fill material discharges in State waters of the Lahontan Region when the Clean Water Act is not applicable (as determined by the USACE). Land disturbance includes clearing, grading, or disturbances to the ground, including excavation and stockpiling, within the footprint of the structure to be constructed, and any staging and access areas that disturb native soil conditions. Potential pollutant discharges from projects covered under the permit consist of products of erosion, construction waste materials, dewatering waste, turbid

water and waste earthen materials from work within surface waters, and small amounts of petroleum products from construction equipment.

California Fish and Game Code Section 1602

Fish and Game Code Section 1602 protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the CDFW in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state, or local governmental agency, or public utility to notify the CDFW before beginning any activity that will:

1. Substantially divert or obstruct the natural flow of any river, stream or lake;
2. Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
3. Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Preliminary jurisdictional evaluations for waters of the state have been completed in support of the Project. These evaluations will be made permanent during final engineering and design of the Project. Acquisition of a Streambed Alteration Agreement, if required, would occur prior to construction of the Project, thus maintaining compliance with Section 1602. A Streambed Alteration Agreement is required in the event that the CDFW determines the activity could substantially adversely affect an existing fish and wildlife resource.

California Water Code Section 13751

Water Code Section 13751 requires a Report of Well Completion to be filed with the California Department of Water Resources (DWR) within 60 days of well completion. New wells must comply with DWR Well Standards as described in Water Resources Bulletins 74-81 and 74-90.

California Water Code Section 4999

Pursuant to Part 5 of Division 2 of the Water Code, wells in the counties of San Bernardino, Riverside, Los Angeles, and Ventura that extract groundwater in excess of 25 acre-feet in any year must file with the Regional Board, within six months of the succeeding calendar year, a “Notice of Extraction and Diversion of Water” on a form provided by the board.

California Water Code Section 1200

This law classifies surface water and groundwater into three categories: surface water, percolating groundwater, and “subterranean streams that flow through known and definite channels.” Only surface water and subterranean stream water are within the permitting jurisdiction of the State Water Resources Control Board (SWRCB). Appropriation of those waters requires a SWRCB permit, and is subject to various permit conditions.

In establishing whether there is a condition of subterranean streams, the SWRCB uses a finding that there must be evidence of bed and banks and water flowing along a line of a surface stream (Sax, 2002). Based on a review of the known and estimated subsurface conditions at the Project site, there is no evidence to support that the groundwater is flowing in subterranean streams, and therefore, no permit for appropriation is required from the SWRCB.

27 California Code of Regulations Section 20200

Title 27 of the California Code of Regulations (§20200 et seq.) provides a waste classification system that applies to wastes that cannot be discharged to Waters of the State. Applicable facilities include brine ponds, as well as various other types of disposal. The proposed brine ponds would be designated as Class II surface impoundments. Therefore, the brine ponds must meet regulatory requirements (27 Cal. Code Regs.§20200 et seq.), which would require permitted approval from the LRWQCB and/or the California Department of Public Health. The LRWQCB can prescribe individual or general waste discharge requirements (WDRs) as part of permit approval. Under Title 27, the discharger must obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from Class II surface impoundments, such as the proposed brine ponds, and also must conduct a monitoring and response program (including for groundwater and surface waters), approved by the LRWQCB. The LRWQCB can specify in the WDRs the specific type or types of monitoring programs required and the specific elements of each monitoring and response program. When closing or decommissioning Class II surface impoundments (both mandatory closure or at the end of the active life of the Unit) the discharger must adhere to a closure and post-closure plan that is approved by the LRWQCB to ensure no impairment of beneficial uses of waters as described in the Basin Plan.

3.19.3.3 Local

San Bernardino County Groundwater Ordinance No. 3872

The County adopted this ordinance to help protect water resources in unregulated portions of the desert while not precluding its use. The ordinance requires a permit to locate, construct, operate, or maintain a new groundwater well within the unincorporated, unadjudicated desert region of San Bernardino County. CEQA compliance must be completed prior to issuance of a permit, and groundwater management, mitigation, and monitoring may be required as a condition of the permit. The ordinance states that it does not apply to “groundwater wells located on Federal lands unless otherwise specified by inter-agency agreement.” The BLM and County entered into a Memorandum of Understanding (MOU), which establishes that the BLM will require conformance with this ordinance for all projects proposing to use groundwater from beneath public lands within the County.

San Bernardino County Technical Guidance Manual for Onsite Wastewater Treatment Systems

The San Bernardino County Department of Environmental Health has published guidelines for the minimum setback and location of septic systems (2007). The guidelines provide guidance to project contractors, engineers, designers, and installers working towards the implementation of

on-site wastewater treatment systems within San Bernardino County. According to the manual, installation of the proposed septic system would require a setback of at least 50 feet between the system and the nearest groundwater well. There are no existing or proposed groundwater wells within this distance of the proposed septic system.

San Bernardino County General Plan

The following policies identified in the Conservation (CO) and Circulation and Infrastructure (CI) elements of the San Bernardino County General Plan are relevant to this analysis (San Bernardino County, 2007).

> ***Policy D/CO 1.8.*** Require future development to utilize water conservation techniques.
>
> ***Policy D/CI 2.1.*** Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.
>
> ***Policy D/CI 3.9.*** The County shall encourage the use of pervious paving materials on all commercial, industrial and institutional parking areas, where feasible. Large parking areas should consider using landscape as depressions to receive and percolate runoff as an alternative.
>
> ***Policy D/CI 3.10.*** Encourage the retention of natural drainage areas unless such areas cannot carry flood flows without damage to structures or other facilities.
>
> ***Policy D/CI 3.12.*** Require commercial or industrial operations with discharges other than standard domestic waste to submit a report for County and Regional Board review. This report shall identify non-domestic or industrial wastes contained in wastewater and shall quantitatively evaluate the potential for water quality impacts from the discharge.

3.19.4 Analytical Methodology

This section briefly discusses the methods and data used in analyzing the potential direct, indirect, and cumulative impacts of the Proposed Action and alternatives on water resources. The analysis of impacts of the build alternatives relating to water resources considers hydrology, groundwater, and water quality. The hydrologic impact assessment addresses the effects of the Project on surface and sub-surface (groundwater) hydrology and the protection of hydrologic resources. Surface hydrology includes both overland, undirected flow and deliberately channeled surface water flow. Hydrologic resources include hydrologically significant areas such as existing natural watersheds, drainages, and springs.

The analysis of water resources-related effects is based on review of the following technical studies, which were prepared in support of the Proposed Action for compliance with state and federal regulations:

1. Caithness Soda Mountain, LLC, 2011. Plan of Development, Soda Mountain Solar Project, (including Appendix D: Draft Water Quality Management Plan) (March 15).
2. RMT, Inc., 2011a. Preliminary Hydrology Study Report (Revised), Soda Mountain Solar Project (March 1).

3. RMT, Inc., 2011b. Hydrogeologic Conditions and Groundwater Modeling Report, Soda Mountain Solar Project (March 1).

4. RMT, Inc., 2011c. Geologic Field Reconnaissance Report: Percolation, Stormwater Runoff, and Channel Scour Potential, Soda Mountain Solar Project (April 4).

5. Diaz Yourman & Associates (DYA), 2010. Preliminary Geotechnical Investigation (Phase 1), Soda Mountain Solar Project (March 1).

6. Wilson Geosciences, Inc., 2011. Geologic Characterization Report, Soda Mountain Solar Project (March 1).

7. Soda Mountain Solar, LLC, 2012. Groundwater Well Permit Application, Soda Mountain Solar Project, San Bernardino County, California (September).

8. Panorama Environmental Inc., 2013a. Water Supply Assessment Soda Mountain Solar Project San Bernardino County, California (January).

9. TRC Solutions, 2013. Hydrogeological Conditions and Groundwater Modeling Report Addendum (May).

These documents were reviewed by BLM and County analysts with appropriate qualifications to verify their applicability to the Project and whether they adequately support the water resources analysis for the Project. In addition to these documents, this analysis relies on various information sources and maps published by federal and state agencies including the USGS, SWRCB, and the National Oceanic and Atmospheric Administration (NOAA).

Placement of certain Project features could alter existing surface water flows, potentially causing localized flooding, excessive soil erosion, damage to under-sized storm drain culverts, and unnatural hydrologic conditions. The analysis of hydrology and groundwater impacts considers whether the build alternatives would alter an existing surface or groundwater condition and the degree of any such change.

The hydrologic analysis evaluates whether the proposed facilities would encroach on an existing perennial or intermittent waterway and alter the natural flow or substantially change and existing geomorphic feature or process. The analysis considers initial project plans, maps of existing topography, and maps showing hydrologic features. The assessment of soil erosion and its potential to affect water quality considers surface soil characteristics, which are available through Applicant-provided, lead agency-reviewed site-specific studies or published maps available through the Natural Resource Conservation Service (NRCS). Considering that soil erosion is a natural process, the analysis considers whether the build alternatives would temporarily or permanently increase the erosion and sedimentation rates and adversely affect water quality. Flood maps, topographic maps, historic data and observation inform the analysis of flooding and are used to determine whether the build alternatives would cause or be adversely affected by periodic flooding. Particular attention is given to alterations of water flow (including stormflow), such as diversions or impediments to flow and to placement or removal of facilities in areas that are subject to inundation or potential damage by flooding. Flooding impacts are evaluated based on the potential to avoid loss of life and property.

The water quality analysis is based on available groundwater quality data and published information available through the LRWQCB and its Basin Plan and considers the potential for the build alternatives to degrade water quality during construction and operation by sediment or other contaminants. Site-specific baseline water quality testing was not conducted to support this analysis.

Groundwater extraction for construction, operation, maintenance, and decommissioning could adversely affect subsurface hydrologic resources, such as wells and springs. There are currently no test wells assessing groundwater resources within the Project area (RMT, Inc., 2011a). Therefore, assessment of the potential effects of action alternative-related groundwater extraction on adjacent water users is based on the results of preliminary numerical groundwater modeling (RMT, Inc., 2011b). The groundwater model assists in determining effects such as changes in groundwater levels, altered groundwater flow paths, increased areas of pumping influence around existing wells, and the effect on neighboring wells. In addition, the groundwater impact analysis considers the loss of groundwater recharge by addition of impervious surfaces, which is determined based on the acreage of proposed impervious surface and the characteristics of local recharge. Changes in existing groundwater pumping could alter local or regional groundwater levels; however, changes in local and regional groundwater levels also could be attributable to seasonal or interannual fluctuation.

3.19.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Project or alternatives (see Section 2.4.6 and Table 2-5), including the following APMs to address potential effects to water resources. These measures primarily were intended to avoid or reduce potential direct and indirect Project impacts related to groundwater quality and consumption and stormwater runoff.

> **APM 14:** The Applicant will construct a test well, observation well, and a distance observation well within the project ROW prior to project construction. The distance observation well shall be located approximately 1,000 feet from the test well and within the alluvial aquifer underlying the Project site. The exact location of the test and observation wells will be determined by a professional hydrogeologist or geologist. A test plan will be submitted to San Bernardino County and the BLM a minimum of 14 days prior to performing the aquifer test. The aquifer test shall be conducted upon completion of the test well and observation wells for a minimum of 72 hours, or as determined by the professional hydrogeologist or geologist. During the aquifer test, groundwater shall be discharged from the test well at a rate of approximately 200 gpm (equivalent to maximum project demand of 300,000 gpd). The necessary permit(s) shall be obtained from the Regional Water Quality Control Board prior to the discharge of groundwater.
>
> **APM 15:** The aquifer test data shall be analyzed by a professional hydrogeologist or geologist. The professional hydrogeologist or geologist will determine the number of Project water supply wells required for the Project by calculating the estimated drawdown in two wells using data from the 72-hour aquifer test (see APM 14, above) and assuming a maximum groundwater demand of approximately 300,000 gpd over the 3-year construction period. If one or more of the wells are expected to run dry at the maximum pumping rate, a third well will be required for the Project.

APM 16: A water quality sample will be collected from the test well and analyzed for TDS by a State of California-certified laboratory. The results will be evaluated by the project engineer to determine the need for a reverse osmosis facility to treat the water for panel washing.

APM 17: The groundwater model will be recalibrated using the measured aquifer properties resulting from the 72-hour aquifer test (see APM 14, above). If the results of the recalibrated model indicate that reduction in outflow from the valley would be less than 50 AFY under proposed project conditions, then no further action will be taken. If the recalibrated model predicts reduced outflow from the northeast outlet of the Valley in excess of 50 AFY, APM 18 will be implemented.

APM 18: If, as described in APM 17, the recalibrated model predicts outflow from the northeast outlet of the Valley reduced by an amount in excess of 50 AFY, the Applicant will hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance of BLM and San Bernardino County. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Soda Mountain Valley, in the alluvial aquifer adjacent to Soda Spring and west of Soda Lake, and at Soda Spring during construction of the project. If the Project is shown to cause a decline in groundwater levels of 5 feet or more in the alluvial aquifer near Soda Spring, or there is a decrease in groundwater discharge at Soda Spring as a result of project groundwater withdrawal that results in the water level in the spring decreasing to less than 4 feet deep, which would threaten the tui chub, an evaluation would be conducted to determine if the Project is causing reduced groundwater discharge at Soda Spring. If it is determined that the Project has caused a decrease in the volume of groundwater discharged at Soda Spring such that the spring is less than 4 feet deep, thereby threatening the tui chub habitat, then the Project shall correspondingly curtail withdrawal of groundwater and import a corresponding amount of water from outside of the Soda Mountain Valley.

Groundwater level measurements in the monitoring wells located in Soda Mountain Valley would be compared to the model predictions on an annual basis during construction and every 5 years during Project operation. The groundwater model would be recalibrated if the measured drawdown values in the monitoring wells exceed the predicted values by more than 15 percent. Monitoring would cease after 5 years of operational monitoring if two conditions are met:

1. The monitoring data support the model predictions.
2. The model predicts the reduction in outflow from the northeast outlet will be less than 50 AFY under proposed project conditions, as detailed in APM 17.

APM 19: During the years of construction in which water extractions exceed 25 acre-feet per year, an annual report shall be provided and a fee shall be paid to the State Water Resources Control Board.

APM 20: If crossing existing washes is necessary, then at-grade crossings will be constructed to maintain existing flow channels and sediment transport, thereby leaving stormwater runoff volume unchanged.

APM 21: If the TDS values for Project well water exceed levels for potable water, then potable water shall be provided from another source, such as a tanker truck.

3.19.6 Direct and Indirect Effects

3.19.6.1 Alternative A: Proposed Action

Water Quality

Construction

Project construction would require the use of heavy machinery for vegetation grubbing, grading, and installation of roads, pipelines, generation facilities, transmission facilities, buildings, the solar field, and other facilities. Construction of these facilities would involve the use of bulldozers, graders, semi-trucks, and other heavy machinery, and would involve changes to on-site topography. These activities would potentially loosen existing surface soils and sediments, increasing the potential for erosion during storm events and discharging sediment or other pollutants into waterways. Additionally, the use of construction equipment may involve the accidental release of fuel, oils, lubricants, antifreeze, and other potentially hazardous substances at the construction site. These water quality pollutants could become entrained in surface water during storm events, and/or be infiltrated into groundwater and the underlying aquifer, resulting in the degradation of water quality.

Waters of the State are present on the Project site in the form of desert washes (Figure 3.3-2). Due to the presence of Waters of the State, the Project would be subject to the state Porter-Cologne Act. The LRWQCB often takes jurisdiction over entire alluvial fans that encompass drainages and desert washes due to the braided nature of these drainages and due to the potential for channel migration over time (Panorama Environmental, Inc., 2013b).

Under General Permit R6T-2003-004, the Applicant would be required to obtain a permit from LRWQCB for dredge and fill (described in Section 3.19.3.2, above) for the project due to the installation of solar panel posts and grading in the Waters of the State (drainages). To obtain authorization for stormwater discharges to groundwater and/or surface water associated with land disturbing activities pursuant to the permit, the LRWQCB would require that a SWPPP or BMP Plan be prepared detailing measures to minimize and avoid impacts to water quality that would be implemented during construction as a part of the dredge and fill permit (Panorama Environmental, Inc., 2013b). The permit also would require monitoring and reporting. To obtain coverage under the General Permit, the Applicant would be required to submit a Notice of Intent (NOI) to comply with the General Permit to the LRWQCB prior to commencement of construction activities. The NOI must include a description of specific temporary and permanent BMPs to be implemented to prevent or minimize the discharge of waste from the Project site during and after construction, and would require the Applicant to install temporary erosion control facilities to prevent transport of sediment and other wastes off the property. General Permit R6T-2003-004 implements the Basin Plan (described in Section 3.19.3.2, above), and dischargers regulated by this General Permit must comply with the water quality standards, guidelines, and prohibitions in the Basin Plan. If the LRWQCB determines that the proposed BMPs would not achieve the applicable standards and receiving water objectives, the Applicant could be required to implement additional or alternative BMPs by the LRWQCB. Additionally, all land disturbing activities must be conducted in accordance with the Lahontan Region Project

Guidelines for Erosion Control (Attachment G of the General Permit), which includes specific BMPs for protecting surface water quality from unnatural or accelerated erosion caused by land development. Implementation of a SWPPP or BMP Plan, as required under General Permit R6T-2003-004, would minimize or avoid the degradation of water quality or the violation of water quality standards, especially during major storm events.

Operation and Maintenance

Potential threats to surface water and groundwater quality related to operation and maintenance include: accidental releases to surface or groundwater from the brine ponds that would be used to dispose of reverse osmosis (RO) reject water; leaching of treated wastewater from the proposed septic field into underlying groundwater; potential increases in sediment loads to adjacent washes due to release of sediments from the site during storm events; and accidental spills of hydrocarbon fuels, oils, and greases, antifreeze, and other liquids associated equipment maintenance and usage on site, which could become entrained in stormwater or groundwater.

Accidental Releases from the Brine Ponds. Degradation of surface water quality could occur as a result of releases from the brine ponds due to accidental overtopping of perimeter berms during a storm event. This could result in a release of concentrated brine and associated water quality pollutants from the brine ponds and into adjacent surface runoff, resulting in the degradation of surface water quality. Mitigation Measure 3.19-1, as set forth in Section 3.19.8, would require that the brine pond berms or levees reach at least 2 feet above the highest anticipated flood flows during a 100-year storm event, or at least 2 feet above the highest adjacent ground, whichever is greater, in order to protect the brine ponds from incident flooding events and ensure that the ponds are not inundated by flood flows and subsequently overtop, resulting in a discharge of pollutants into Waters of the State. Implementation of this mitigation measure would minimize risk of spillage of water from the brine ponds onto adjacent areas during major storm events. Additionally, under California Code of Regulations Title 27 (described in Section 3.19.3) the discharger must obtain and maintain assurances of financial responsibility for initiating and completing corrective actions, such as remediation and restoration, for all known or reasonably foreseeable releases from Class II surface impoundments, such as the proposed brine ponds.

Degradation of groundwater quality also could occur as a result of leakage through the proposed brine pond liner. The brine ponds would be constructed with a plastic liner and a leak detection system. The brine ponds would be designed and constructed as a Class II Waste Management Unit in accordance with Title 27 Guidelines, and would be permitted in accordance with Title 27 discharge permit requirements of the LRWQCB, which would require adherence to WDRs and minimum standards for the pond liner. The WDRs would include monitoring of the pond liner to detect leaks, as well as groundwater monitoring. Application of WDRs to the facility by the LRWQCB would be tailored to the anticipated quality of water contained in the brine pond, in order to protect beneficial uses detailed in the Basin Plan from accidental release of pond pollutants. Therefore, adherence to the requirements of Title 27 of the California Code of Regulations and the conditions of the WDRs would ensure that groundwater quality would be protected from degradation due to leakage from brine ponds, consistent with the Basin Plan.

Water Quality Impacts from the Proposed Septic System. Wastewater generated at the operation and maintenance building would be collected and treated by a septic system. The use and application of septic fields is a long established practice as a method of wastewater treatment. The proposed septic system would be designed and permitted in accordance with state and County requirements, such as County requirements for on-site waste water disposal systems (San Bernardino County, 1992). Installation of the septic system would require a permit issued by the San Bernardino County Department of Public Health. As a result, the soils present at the location of the proposed septic system would have to be suitable to support such a system. These types of systems result in wastewater constituents being non-detectable in groundwater within 5 to 10 feet of the bottom of the leach field, depending on the septic system design. Additionally, the septic system and leach fields for the Project would be constructed in accordance with the following requirements:

1. Uniform Plumbing Code (UPC) §15.24.010, Appendix K for Private Sewage Disposal – General and Disposal Fields; and

2. UPC Section 8.124.030 (Approval and Construction Permit for Sewage Discharge) and Section 8.124.050 (Operation Permit for Sewage Disposal).

Additionally, Mitigation Measure 3.7-3 (septic site feasibility test) would require that standard in-situ testing (deep percolation tests) be performed at locations where septic or alternative wastewater disposal systems are proposed and documented (and make available to BLM) that proposed sites for septic or alternative wastewater disposal systems meet all applicable standards. Through adherence to the described regulations and Mitigation Measure 3.7-3, groundwater quality would be protected from degradation. Site-specific investigation has concluded that groundwater, bedrock, or impervious soil does not exist within 12 feet of the ground surface, the site is not located within a flood zone, and the site is large enough to serve the proposed system with applicable setbacks (RMT, Inc., 2011a).

Release of Sediments during Storm Events. Impacts relating to the release of sediments resulting from operation and maintenance of the Project are discussed in detail below under “Storm Drainage and Erosion.” Under the Project, existing runoff patterns would be preserved to the extent possible. APM 20 would ensure that, if crossing existing washes is necessary, at-grade crossings will be constructed to maintain existing flow channels and sediment transport, thereby leaving stormwater runoff volume unchanged. Also, runoff flows would not be diverted around solar fields, but would flow through the solar fields within existing washes and drainage channels. No new channels or diversion structures will be constructed for the Project site and major drainages will be avoided. Berms would be constructed along the edge of key drainages as shown in Figure 2-1. The berms would be located outside main swale flow areas and would be constructed to prevent occasional side channel flows that may develop during high runoff events from entering the solar array field. Once construction is complete, the surface of the soil under the solar panels will generally be the same as the present condition except in areas where soil has been compacted, or rocks have been removed by grading. Vegetation would be allowed to naturally reestablish and may be trimmed during operation and maintenance of the Project as necessary. There would be minor changes to the soil and land cover conditions resulting from vegetation removal, soil compaction, grading, and gravel base for the permanent access roads. The Project does not involve the addition of substantial

areas of impervious surfaces within the solar array area and would therefore not substantially change the runoff conditions. As described in detail under "Storm Drainage and Erosion," below, implementation of Mitigation Measure 3.19-2 would ensure that changes to surface water drainage do not result in a net impact to downstream waterways from erosion or sedimentation during operation and maintenance by requiring the Applicant to develop and implement a comprehensive drainage, stormwater, and sedimentation control plan. Existing flow paths and drainage patterns would not be changed in the post-development condition and it is not anticipated that runoff volumes, peak discharges, or sediment transport, all of which are factors affecting the release of sediments from the site during storm events, would be substantially altered from pre-development conditions.

Accidental Spills of Pollutants. During operation and maintenance, the on-site use of trucks, maintenance equipment, automobiles, and other equipment could result in the accidental release of water quality pollutants. For example, water quality impacts could occur if contaminated or hazardous materials (e.g., oils, greases, fuels) used during operation and maintenance were to contact stormwater and drain off-site, or infiltrate into the underlying aquifer, especially during storm events. Potential spills of hazardous materials would be managed through hazardous materials management measures, described in Section 3.8, *Hazards and Hazardous Materials*, to avoid or minimize the degradation of water quality during operation and maintenance of the Proposed Action.

Decommissioning

Decommissioning impacts generally would be similar to those indicated for construction, with respect to the potential for release of construction related water quality pollutants. As discussed above for construction, decommissioning would involve construction activities and land disturbance and would require coverage under General Permit R6T-2003-004, administered by the LRWQCB. Coverage under the General Permit will require that a SWPPP or BMP Plan be implemented to minimize or avoid impacts to water quality. Implementation of a SWPPP or BMP Plan would minimize the degradation of water quality or the violation of water quality standards, especially during major storm events. As described in detail under "Storm Drainage and Erosion," below, implementation of Mitigation Measure 3.19-2 would ensure that changes to surface water drainage do not result in a net impact to downstream waterways from erosion or sedimentation during operation and maintenance by requiring the Applicant to develop and implement a comprehensive drainage, stormwater, and sedimentation control plan. Additionally, adherence to LRWQCB policies and stipulations of the brine pond WDRs, including applicable decommissioning procedures required under Tile 27 (described in Section 3.19.3, above), would ensure that water quality impacts associated with removal of that facility would be minimized.

Groundwater Supply and Recharge

The Applicant proposes to drill up to three wells on the Project site for non-potable water supply for construction and operation and maintenance. Possible well sites are shown in Figure 2-1. The Applicant estimates that 200,000 gallons per day (gpd)[4] or approximately 192 AFY would be

[4] This assumes a 6-day work week.

needed during construction for dust control and other construction-related uses. Over the 24- to 30-month construction period, total construction water consumption would be approximately 384 to 480 AF. Operational non-potable water needs are estimated to be approximately 31.4 AFY. Construction and operation and maintenance of the Project could affect groundwater supply and recharge if one or more of the following occurs:

1. the affected groundwater basin currently is characterized by long-term overdraft conditions;
2. construction and operation and maintenance activities result in long-term overdraft conditions;
3. substantial drawdown occurs at groundwater wells or surface water features in the area as a result of construction and operational groundwater pumping; or
4. natural recharge to the groundwater basin is affected, such as through the introduction of impervious areas that prevent infiltration.

Groundwater overdraft occurs when the quantity of water removed from a groundwater basin exceeds the rate of recharge to that basin. This effect may be long-term, where substantial permanent new groundwater demands are introduced, or short-term, where new groundwater demand(s) are temporary and the balance of groundwater removal and recharge is restored once the new demand(s) ceases. Overdraft conditions can be temporary and of varying duration, depending upon the location, intensity and duration of groundwater extraction, and the flow properties of the aquifer which control the magnitude and extent of the water level drawdown and recovery responses. Groundwater overdraft causes groundwater levels to decrease. The lowering of groundwater levels can result in reduction of well production rates, damage to wells due to exposure of well screens, and in some cases increased energy costs because additional pumping is required to draw the same volume of water from affected wells.

Creation of new impervious surfaces associated with the Proposed Action could interfere with groundwater recharge by reducing the amount of surface area through which precipitation and surface water percolates to underlying aquifers. New impervious surfaces would result from the implementation of permanent project components, such as the O&M facility and substation. In addition to permanent infrastructure, temporary construction facilities including covered assembly areas and staging areas would also introduce new impervious areas that could affect the rate and distribution of surface water infiltration and percolation to underlying groundwater.

As described in Section 3.19.4, above, analysis of groundwater resources-related impacts is based primarily on the technical studies provided in Appendix H. Where appropriate, a distinction is made between temporary impacts, which would occur during construction only, and long-term impacts, which would occur during all Project phases.

Groundwater modeling was used to help evaluate whether the hydrogeologic conditions at the Project site could sustain the withdrawal of water needed during construction and operation of the proposed facility without causing impacts to nearby water users or water resources located within the Mojave National Preserve (TRC Solutions, 2013). The specific objectives of the groundwater modeling effort related to groundwater-resources impacts from the Proposed Action were as follows:

1. To evaluate whether subsurface conditions would likely allow for one or more groundwater wells to successfully be installed that would yield sufficient quantities of water for Project construction and operation activities.
2. To evaluate whether groundwater withdrawals needed to support Project construction and operation activities would interfere with water use and springs located elsewhere in the region, such as the community of Baker, Soda Spring, and the Rasor Road Service Station.
3. To estimate the number of groundwater wells that may be required to obtain the desired water supplies.

Numerical groundwater modeling is an effective tool to simulate and evaluate the effects of groundwater withdrawal, because the model can be constructed to represent the three-dimensional geometry and hydrogeologic characteristics of the aquifer, using actual (preferred) or estimates of key aquifer parameters. The equations of groundwater flow are then applied using site-specific (preferred) or estimated information on hydraulic parameters, aquifer geometry, and boundary conditions, and the resulting hydraulic head distribution can be compared to measured hydraulic heads. The calibration process involves adjusting aquifer parameters and boundary conditions within reasonable limits until there is a match between measured heads and model-predicted heads. Once the model is calibrated to existing conditions, it can then be used as a preliminary predictive tool to test for future effects of a stress, such as groundwater withdrawal. When hydrogeologic data are scarce, the model can be used to test specific questions using the upper and lower ends of a reasonable range of aquifer parameter values. Information on hydrogeologic baseline conditions is presented in Section 3.19.2.3, above. For detailed discussion of groundwater model setup, assumptions, parameters, and calibration, see Appendix H.

Water supply wells were simulated as operating under the conditions expected during construction and operation and maintenence. Specifically, one and three wells were simulated to be pumping continuously at a combined rate of 192 AFY to accommodate the proposed water use of 200,000 gallons per day, 6 days per week (average continuous withdrawal of 171,000 gallons per day, or 22,913 cubic feet per day) for a period of 3 years (a conservative estimate of the construction duration used for model simulations). Subsequently, one and three wells were simulated with combined extraction of 33 AFY for an additional 27 years (total simulation time of 30 years, the anticipated life of the Project). The locations for the three groundwater extraction wells were selected based on existing hydrogeologic data and borings (discussed in Appendix H) and also based on proximity to Project operational facilities. The three locations are shown on Figure 2-1 and identified as W-1, W-3, and W-4. Location W-4 was selected as the optimal location for simulation of a single water supply well; however, it is likely that two to three wells would be constructed to provide backup water supply and allow for supplemental supply during well maintenance. Simulations were conducted for single well and three-well scenarios to evaluate the feasibility of obtaining sufficient water with acceptable drawdown under these scenarios.

Aquifer recharge (discussed in Section 3.19.2.3) is a difficult parameter to determine directly, and is generally estimated based on area precipitation and evaporation data, or data from groundwater flow model simulations from similar areas (RMT, 2011b). A range of recharge values was used to estimate aquifer recharge for the Project area. At the high end, a recharge value of 0.4 inches/year

was assigned (10 percent of rainfall, with average of 4 inches per year used in model setup) (TRC Solutions, 2013). The low end estimate of recharge used in simulations was 0.12 inches/year (3 percent of annual rainfall). These values bracketed the reasonable estimates of groundwater recharge from direct precipitation for the valley (TRC Solutions, 2013). No additional recharge from infiltration from ephemeral streams was assumed, which underestimated the actual amount of recharge in the valley, and thus was considered a conservative assumption (RMT, 2011b). More details on aquifer parameters used in the model, such as hydraulic conductivity and storage coefficient, are presented in Appendix H. The total input to the aquifer based on the recharge rates described above were estimated to be 376 to 1,330 AFY of recharge (TRC Solutions, 2013). Therefore, the proposed use of water for construction and operation of the Project is within the estimated safe yield of the Soda Mountain Valley. The low-end recharge rate of 376 AFY would be more than the annual Project construction water demand of 192 AFY. The operational demand of 31.4 AFY is also within the safe yield with the low-end recharge rate (TRC Solutions, 2013).

The groundwater pumping simulations show that that there is adequate groundwater in the Soda Mountain Valley to support construction and operation and maintenance of the solar project without adversely affecting nearby wells or sensitive water resources (TRC Solutions, 2013). Groundwater pumping simulations conducted using both the low-end and high-end recharge rates and corresponding low-end and high-end hydraulic conductivity values indicate a decline in the groundwater table of less than 1 foot to approximately 2 feet at the nearest bedrock interface east of the wells after 3 years of construction and over the operational period of the project (TRC Solutions, 2013). The results of the single-well scenario indicate that a single well could support construction water demand with high-end recharge and conductivity values, but would be inadequate under a low-end recharge and low-end hydraulic conductivity scenario. The simulations show that three wells would supply an adequate amount of water for construction under all scenarios. Detailed results for each of the model scenarios are provided below and are summarized in Tables 3 and 4 in Appendix H-3).

Three Wells, High-End Recharge Parameter Set (10 Percent Recharge)

The model results under this scenario indicate a predicted maximum drawdown of about 28 feet, 20 feet, and 25 feet at Wells W-1, W-3, and W-4 respectively after 3 years of pumping at 171,000 gallons per day or 192 AFY (representing the construction phase). Extraction rates would decrease to 31.4 AFY during operation causing the radius of influence to be slightly wider in extent. The maximum drawdown would be approximately 1 foot at the closest bedrock interface east of the wells. The drawdown of 1 foot would not extend beyond the Soda Mountain Valley groundwater subbasin underlying the Project site. Figures 7 and 8 in Appendix H-3 show the resulting drawdown and radius of influence predicted around a water supply well after 3 years of pumping at three wells for the construction phase and after 30 years pumping under the operation phase, respectively, using the high-end parameter set.

Three Wells, Low-End Parameter Set (3 Percent Recharge)

With low-end values of hydraulic conductivity and recharge, the predicted drawdown is much higher at the well locations than with the high-end parameter set. The maximum predicted drawdown is approximately 110 feet, 68 feet, and 91 feet at the model nodes for Wells W-1, W-3, and W-4 respectively. The model results indicate the maximum drawdown at the closest bedrock

interface east of the wells would be less than 1 foot after 3 years of construction. Modeling indicates that under this scenario, the radius of influence resulting from well pumping would not significantly increase during operation. The maximum predicted drawdown is less than 1 foot at the closest bedrock interface to the east of the wells. The drawdown of 1 foot would not extend beyond the Soda Mountain Valley groundwater subbasin underlying the Project site. Figures 9 and 10 in Appendix H-3 show the resulting drawdown and radius of influence predicted around a water supply well after 3 years of pumping at three wells for the construction phase and after 30 years pumping under the operation phase, respectively, using the low-end parameter set.

One Well, High-End Parameter Set (10 Percent Recharge)

The resulting drawdown predicted around a water supply well after 3 years of pumping at one well (W-4) of 192 AFY with the high-end parameter set (10 percent recharge) is a maximum of approximately 80 feet. Modeling indicates that under this scenario, the radius of influence resulting from well pumping would not significantly increase during operation. The model predicts the maximum drawdown at the closest bedrock interface east of the wells would be approximately 2.2 feet. The drawdown of 2.2 feet would not extend beyond the Soda Mountain Valley groundwater subbasin underlying the Project site. Figures 11 and 12 in Appendix H-3 show the resulting drawdown and radius of influence predicted around a water supply well after 3 years of pumping at three wells for the construction phase and after 30 years pumping under the operation phase, respectively, using the high-end parameter set.

One Well, Low-End Parameter Set (3 Percent Recharge)

The model results indicate that with the low-end parameter set, a single well (W-4) would go dry quickly once pumping begins. The results of the model indicate a single well would not be able to sustain the required extraction rate of 192 AFY during the construction phase. The 30-year, one-well scenario was therefore not modeled.

Effects to Local Groundwater Supply

The maximum predicted drawdown associated with the project is approximately 110 feet in the immediate area of Well W-1 under the scenario of three wells pumping assuming a low-end (3 percent) recharge rate and low-end hydraulic conductivity. The area of extent where drawdown of groundwater levels exceeds 1 foot (or 2.2 feet under the one well, high-end parameter set) is limited in extent to the area within close proximity to the well (Figure 9 in Appendix H-3); no existing wells or springs are located within this radius. Additionally, for all wells under all scenarios (other than that assessed for a single well under low-end recharge), the area where groundwater drawdown exceeds 1 foot (or 2.2 feet under the one well, high-end parameter set) would not extend beyond the Soda Mountain Valley groundwater basin underlying the Project site. Figures 7 through 12 of Appendix H-3 present groundwater level decline contours from the proposed production wells at the end of construction and end of operation and maintenance, respectively. Given the current understanding of the hydrogeology, as well as the current understanding concerning existing wells that may be affected by Project-induced drawdown, it is unlikely that groundwater pumping for the Project would cause any nearby wells to go dry or be severely impaired or rendered unusable by declining groundwater levels.

Effects to Soda Mountain Valley Groundwater Outflow and to Soda Spring at Zzyzx

Observed conditions at the site and in the regional groundwater system support the assumption for the presence of low permeability bedrock in Soda Mountain, located southeast of the Project area. The water table in the Soda Mountain Valley is situated approximately 200 to 300 feet above the surface of Soda Lake. Substantial fracturing and groundwater discharge in secondary porosity through the mountains would have drained the Soda Mountain Valley groundwater basin if extensive and connected fracturing existed. The existing model incorporated focused discharge through two outlets from the valley, the northeast and the southeast outlets, that allowed groundwater to flow from the model domain to the east (TRC Solutions, 2013). The model simulated groundwater discharge into Soda Lake through these two outlets. The model area was therefore not surrounded entirely with impermeable boundaries.

Groundwater outflow through the northeast and southeast outlets of the Soda Mountain Valley is thought to contribute additional recharge to the alluvial fans east of the Soda Mountains (TRC Solutions, 2013). This outflow from the valley may flow towards the Soda Lake Playa and evaporate off the playa, or it may combine with local recharge on the east side of the South Soda Mountains and flow towards Soda Spring. Groundwater outflow from the eastern outlets of the Soda Mountain Valley is estimated in the groundwater flow model for existing (steady-state) conditions to be 121.2 AFY with low-end recharge and 424.8 AFY with high-end recharge. Assuming that this flow contributes to local recharge and flows to the spring, the total combined groundwater flow from the eastern side of the Soda Mountains and Soda Mountain Valley groundwater outflow that is available at Soda Spring is estimated to be 147.2 AFY to 511.5 AFY.

Model results indicate that under any of the pumping scenarios described above, the discharge of groundwater from the Soda Mountain Valley would be diminished only slightly by the Project. The maximum potential reduction in flow is modeled to be 4.6 AFY or less after 30 years of pumping three wells under high recharge, equivalent to about 2 percent or less of the current outflow) as shown in Table 4 of Appendix H-3, with a lower level of reduction of 2.6 AFY (0.6 percent reduction) or less during the 3-year construction period for the Project. The groundwater discharge from the Soda Mountain Valley would continue to follow the current presumed flowpaths, including potential flow down the alluvial fans along the east side of the Soda Mountains. It is unknown whether the outflow from the Soda Mountain Valley contributes to groundwater flow at Soda Spring or whether the source of groundwater for Soda Spring is entirely local recharge on the east side of the south Soda Mountains. The northeastern outflow from the Soda Mountain Valley may flow east towards the Soda Lake Playa rather than south towards Soda Spring at Zzyzx. There are approximately 3 to 4 miles of bedrock separating the Project groundwater wells from Soda Spring. A drawdown of 2.2 feet or less at the nearest bedrock interface (as discussed for the one well, high-end recharge scenario, above) is not expected to propagate to a distance of over 3 to 4 miles, particularly through the granitic and volcanic bedrock that comprises the South Soda Mountains. The presence of low-permeability bedrock between Soda Spring and the Project valley indicate that there would be no change in groundwater levels at Soda Spring as a result of 2.2 feet or less of drawdown at the bedrock interface on the west side of the South Soda Mountains. In comparison, groundwater levels in monitoring wells near Zzyzx fluctuate naturally by 1 to 2 feet with no effect on the water level of Soda Spring (TRC Solutions, 2013). The minor reduction in outflow from the Soda Mountain

Valley as a result of project groundwater use would therefore be very unlikely to effect on groundwater flow at Soda Spring (TRC Solutions, 2013).

In considering the information and analysis provided above, it is important to note that groundwater level responses from the Proposed Action are based entirely on a conceptual model of the geology and predictive groundwater modeling results that assume a range of aquifer conditions, groundwater dynamics, and recharge conditions. While predictive groundwater models can be useful tools to further characterize the significance of a response from a proposed change in groundwater extraction, it must be understood that an inherent level of uncertainty remains as well as certain risks related to the limitations of groundwater modeling. Therefore, it can only be concluded that because the predictive models have shown that groundwater levels would decline in response to Project groundwater extraction and use there exists the potential that the project could affect water levels at Soda Spring.

The uncertainties inherent to predictive groundwater modeling can be reduced by obtaining field monitoring and resource observation data in the area affected by a project. The proposed Project includes a series of groundwater APMs intended to provide a mechanism for monitoring and field observation. The purpose of the APMs is to minimize and avoid adverse effects relating to groundwater outflow from the Soda Mountain and potential associated effects to water levels at Soda Spring.

APMs 14 and 15 (Section 3.19.5) would ensure a comprehensive groundwater investigation is conducted, including an aquifer pump test, by a professional hydrogeologist or geologist. The plan for the comprehensive groundwater investigation would be reviewed by the County prior to being conducted. The data collected from the investigation would be analyzed by the professional hydrogeologist or geologist and used to determine the number of Project supply wells needed to avoid adverse effects, such as excessive drawdown causing a well to run dry. Following the comprehensive groundwater investigation, under APMs 17 and 18, the groundwater model used to predict the effects of Project groundwater use would be recalibrated using the measured aquifer properties resulting aquifer test. If the results of the recalibrated model indicate a reduction in outflow from the valley of less than 50 AFY under proposed Project conditions, then no further action will be taken. However, if the recalibrated model predicts reduced outflow from the northeast outlet of the Valley in excess of 50 AFY, the Applicant would hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance by the BLM and San Bernardino County. As described in Section 3.19.5, the groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Soda Mountain Valley, in the alluvial aquifer adjacent to Soda Spring and west of Soda Lake, and at Soda Spring during Project construction. If, under the monitoring plan, it is determined that the Project has caused a decrease in the volume of groundwater discharged at Soda Spring to a degree that could threaten tui chub habitat, then the Project shall correspondingly curtail withdrawal of groundwater and import a corresponding amount of water from outside of the Soda Mountain Valley. Groundwater outflow from the Soda Mountain Valley would return to preexisting conditions after decommissioning of the Project.

While a groundwater investigation (APMs 14 and 15) in conjunction with model calibration (APM 17) would quantify effects on groundwater resources and would assist in reducing uncertainty related to the limitations of groundwater modeling, the action criteria and significance thresholds detailed in APMs 17 and 18 are short term in nature (i.e. cessation of monitoring after 5 years if certain conditions are met) and action criteria may not be adequate to reduce adverse effects to water levels at Soda Spring. The APMs, while restrictive in certain cases, may not address adverse conditions to the surface or groundwater resources until damage has occurred and therefore, this is considered an impact of the Project. **Mitigation Measures 3.19-3 and 3.19-4** have been developed to supplement the APMs and to further ensure that adequate testing, monitoring and reporting are completed on a reasonable schedule to avoid damage to the groundwater and surface water resources, especially at Soda Spring.

Mitigation Measure 3.19-3, as presented in Section 3.19.8, would require a comprehensive Groundwater Monitoring and Mitigation Plan (Plan) be implemented that incorporates San Bernardino County groundwater monitoring guidelines (San Bernardino County, 2000). The Plan would ensure that adequate data is gathered to determine groundwater flow and occurrence in response to the introduction of project-related pumping. In addition, the Plan would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects from the proposed project pumping in the aquifer and Soda Spring. As described in Section 3.19.3.3, groundwater management, mitigation, and monitoring may be required as a condition of San Bernardino County granting a well permit. Also, the BLM and County entered into a Memorandum of Understanding (MOU), which establishes that the BLM will require conformance with County requirements for all projects proposing to use groundwater from beneath public lands within the County. As a result of monitoring required by Mitigation Measure 3.19-3, the County and BLM would determine whether water resources within the vicinity of the Project, such as Soda Spring, are influenced by Project activities, and could require the Applicant to implement corrective measures to address such influence. Additional measures could include curtailing or, if necessary, ceasing withdrawal of groundwater and identifying alternative water sources such as importation of water from outside of the Soda Mountain Valley. **Mitigation Measure 3.19-4,** as presented in Section 3.19.8, would require that a ground water testing plan be submitted to the BLM and the County within two weeks (14 days) after the issuance of a Notice to Proceed. The testing plan provides for the construction of one production/test well in the South Array field and two observation wells. The exact location of the observation wells shall be determined by a professional hydrogeologist in consultation with the BLM and the County. Additionally, a well test would be conducted to determine if a significant drawdown in the aquifer that may affect the Mohave tui chub occurs.

Effects to Groundwater Recharge

Installation of new impervious surfaces can in some cases result in reductions in ground surface infiltration capacity, potentially causing reductions in net groundwater recharge. As discussed in greater detail below (see subsequent discussion of stormwater flows), the Project would result in the installation of up to approximately 2,244 acres of new impervious surfaces, including 2,165 acres associated with the proposed solar field, and up to 79 acres associated with the proposed facilities. However, within the solar field, the proposed panels are not expected to interfere with stormwater infiltration; rainfall incident on the panels would fall to the ground,

which would remain pervious, and be permitted to infiltrate. Infiltration of stormwater would be prevented from occurring within the impervious areas of associated facilities. However, the sandy desert soils located on site have generally high infiltration capacity. Additionally, areas surrounding the Project site would not be affected, and would remain pervious. Therefore, the potential effects of the proposed impervious surfaces on site would be minimal in comparison to the overall infiltration capacity of the Project site and surrounding areas. Groundwater recharge would not be reduced or adversely affected during construction or operation and maintenance of the Proposed Action. Groundwater recharge in the Soda Mountain Valley would return to preexisting conditions after decommissioning of the Project.

Storm Drainage and Erosion

Construction and Operation and Maintenance

Project Site Drainage. The Project would be installed in an area that is drained primarily by sheet flow and desert washes. As described in Section 3.19.2, the requested ROW area encompasses about 7 square miles of undeveloped desert land and is situated between the Soda Mountains and the adjacent Mojave National Preserve. The Project site sits on alluvial fans with braided channels that drain the surrounding mountains. Stormwater from the adjacent mountains drains across the project site towards the Mojave River and Soda Lake (Figure 3.19-2). The active washes crossing the Project site are generally unstable and subject to erosion, incision, and avulsion/migration of the braided channel network (RMT, 2011c). I-15 bisects the larger alluvial topography, and the highway has redirected the historic stormwater flow patterns that existed prior to construction of the highway. I-15 has cut off the historic braided channel networks, channeling upgradient flows through six large culvert and bridge crossings under the highway. New alluvial fan morphology has developed downstream of each of these crossings, which has been tracked via aerial photographs and field surveys (RMT, Inc., 2011a; 2011c). Low-frequency, high-intensity monsoonal storms in the region can result in high volumes of stormwater flow within the vicinity of the Project site, which can cause high volumes of surface runoff to occur in the vicinity of the Project area. Average annual rainfall in the area is about 4.19 inches and the maximum monthly recorded rainfall is 3.43 inches (WRCC, 2012). The 100-year, 24-hour rainfall depth is about 2.97 inches (RMT, Inc., 2011a).

The Project site in its existing condition forms two watersheds, Basin A (north) and Basin B (south) (Figure 3.19-4). The northern watershed includes about 20,160 acres composed of about 65 percent mountains and 45 percent alluvial fan areas on either side of I-15 that drain to the northwest side of I-15, crossing the highway under a bridge just north of the Zzyzx Road. The estimated 100-year peak flow at the Zzyzx Road crossing is about 8,062 cubic feet per second (cfs) (RMT, Inc., 2011a). The southern watershed includes about 9,480 acres with about 60 percent mountains and 40 percent alluvial fans that drain to the southwest. The estimated 100-year peak flow for this southern watershed is about 3,638 cfs (RMT, Inc., 2011a). About 5,500 acres of the watershed lie north of I-15 with a 100-year peak flow of about 3,291 cfs conveyed across I-15 through two crossings including a box culvert and 75-foot-wide bridge over the Opah Ditch. Based on field reconnaissance and experience by BLM staff, the southern watershed contributes significant volumes of sand to the Mojave dune complex located south of

the Project site, which provides critical habitat for the endangered Mojave fringe-toed lizard (ESA, 2013) (for detailed discussion see Section 3.4, *Biological Resources - Wildlife*).

Project Stormwater Management Approach. In consultation with BLM Staff, the Applicant has developed a drainage plan (described in detail in Section 2.4.2.9, Drainage and Erosion Control) that would preserve existing drainage patterns to the extent possible (Soda Mountain Solar, LLC, 2013). The Proposed Action would not detain runoff on site or substantially interfere with existing drainage patterns on or off the Project site in order to preserve existing drainage patterns and sediment transport through the Project site. Existing runoff patterns would be preserved to the extent feasible and upgradient stormwater runoff would not be diverted around solar fields. Grading of up to 1,155 acres and the other types of ground treatment described in Section 2.4.3.2 would be conducted outside of existing major drainage channels to the extent feasible and would not involve substantial changes to the topography of the site. The Project includes drainage avoidance areas within the active washes: both the historic washes and those that have formed downgradient of the culverts and bridge crossings under I-15 (Figure 3.19-8). Adjacent to these drainage avoidance areas, flood protection berms are proposed to limit the potential for flood flows to migrate into the planned solar array fields (Figure 3.19-8). Within the proposed solar array areas, the existing topography, including the existing drainage channels, would be preserved with minimal disturbance except as needed for temporary and permanent access roads to facilitate construction and maintenance access. Once construction is complete, the surface of the soil under the solar panels would generally be the same as the baseline condition except in areas where soil has been compacted or rocks and isolated surface undulations have been removed by grading. Stormwater originating upgradient and within the solar fields would generally flow through the solar array fields following the existing topography. This approach has been selected to minimize changes in runoff flow rates and volumes and in sediment transport to the Mojave dune complex down gradient of the Project site.

During construction, there would be minor changes to the soil and land cover caused by vegetation removal, soil compaction, grading of temporary and permanent access roads, and gravel base for the permanent access roads. Permanent access roads would also be compacted and may include gravel surface treatment. Impervious surface area would increase incrementally due to construction of support columns, operation and maintenance building, warehouses, water tanks and the proposed substation. Due to the limited additional impervious surface within the proposed array fields, runoff volumes and flowrates are not expected to change significantly. Following construction, the surface conditions would be generally similar to the current existing conditions except in areas where soil has been compacted or where larger rocks have been removed. Vegetation would naturally reestablish except where cement or gravel have been applied, and would be trimmed as necessary to facilitate operation of the Project.

Detailed hydrologic analysis will be performed, incorporating existing available topographic information supplemented with site specific LIDAR topography, during the detailed design stage for the Project (Soda Mountain Solar, LLC, 2013). As part of this hydrologic analysis, runoff analysis methodologies appropriate for alluvial fan hydrology will be used to determine the pre- and post-development peak discharges, water depths, and velocities for both smaller, more frequent events (2-, 5-, and 10-year), as well as larger design storm events (100-year) (Soda

Mountain Solar, LLC, 2013). The results of this analysis would be incorporated into final design, and both the analysis and final design would be reviewed and approved by the BLM prior to the Notice to Proceed.

The Project site would consist of three main solar array areas, the North, East, and South Arrays (Figure 2-1). Runoff from the alluvial fan north and west of the North Array would be permitted to flow through the North and East Arrays through the existing shallow channels, maintaining existing flow patterns to the extent feasible. See Figure 3.19-8. In the South Arrays, solar panels would not be placed within the flow corridors downstream of the three existing culverts under I-15 to allow flows from the culverts to follow existing braided flow channels. Flood protection berms would be constructed along the edge of major drainage corridors to prevent occasional side channel flows from entering the solar fields.

Effects relating to stormwater, drainage, and erosion were considered for the following main Project elements:

1. Solar Array Fields – construction of the north, east, and south solar array fields and associated drainage areas.
2. Construction corridors – construction of the linear solar tracker strips including the removal of vegetation and larger cobbles and boulders.
3. Temporary access roads – construction of temporary access roads including clearing and grubbing and removal of larger boulders.
4. Permanent access roads – construction of permanent access roads including compaction and surfacing with gravel in addition to clearing and grubbing and removal of larger boulders.
5. Drainage avoidance areas and flood protection berms – use of flood protection berms to control flood flows to limit runoff from flowing onto the solar array fields.

The following discussion reviews potential changes that could result in increased stormflows, altered drainage patterns, erosion, and sedimentation at the solar field and associated appurtenances for each of the Project components listed above.

North Array. The North Array area is located north of I-15 with planned solar collector fields set between an existing unpaved access road and an existing high-voltage transmission line. Runoff from the alluvial fan north of North Array would be permitted to flow through the array in the existing shallow drainage channels. Runoff from the alluvial fan west of the North Array would flow within the existing drainage corridor which would be protected from construction activities as a drainage avoidance area (Figure 3.19-8). A flood protection berm intended to limit overflows from the drainage corridor from entering the array field is proposed for the southwest side of the North Array. The proposed flood protection berm would not significantly change drainage pathways within the drainage avoidance area. However, this proposed berm would intercept and redirect stormwater flows generated in the alluvial fans within and north of the North Array field. A 17-square-mile watershed drains through the North Array (Soda Mountain Solar, LLC, 2013). A portion of the runoff generated in the 17-square-mile upgradient watershed and within the

North Array would be intercepted by the proposed flood control berm. The estimated 100-year peak flow through the North Array is 4,922 cfs (RMT, Inc., 2011a). Therefore, the proposed flood protection berm associated with the North Array would redirect a portion of the upgradient and onsite flood flows and could result in increased rates of erosion and altered sediment transport.

Southwest of the proposed North Array, the Project would include a substation and switchyard covering about 15 acres. The proposed substation and switchyard would be located outside of any active alluvial washes. The proposed substation and switchyard would be constructed on a gravel base and is not expected to significantly change runoff volumes or flow rates due to the gravel base and the relatively limited disturbance area as compared to the larger total watershed.

East Arrays. East Arrays 1 and 2 would be located on either side of an existing drainage swale flowing northward toward I-15. Runoff from the alluvial fan at the base of the mountains to the east would be permitted to flow through the proposed solar array field in the existing shallow drainage channels. There are no flood protection berms proposed for the East Arrays, and the array fields would avoid encroaching on the existing larger drainage swale.

South Arrays. South Arrays 1, 2, and 3 would be situated to avoid the alluvial washes that have formed east of the three culvert/bridge crossings under I-15. Downgradient of each culvert/bridge crossing, three drainage avoidance areas are proposed to allow flows to follow the existing braided alluvial washes (Figure 3.19-8). Adjacent to the drainage avoidance areas, flood control berms are proposed to limit the potential for overflows or avulsing channels from impacting the proposed array fields.

Just north of the northern end of the South Arrays, the proposed flood protection berm would allow flows that pass under I-15 in the Opah Ditch to continue through the site unimpeded along a drainage avoidance area. The central drainage avoidance area (Figure 3.19-8) is intended to allow flows from the existing upgradient box culvert under I-15 to pass through the South Array without altering the existing braided drainage channel network. However, based on the preliminary location of the proposed flood control berms for the Proposed Action, the proposed northern flood control berm bounding the central drainage avoidance area intercepts and redirects a portion of flows along the northern most branches of the braided channel network that has formed down-gradient of the existing box culvert. The proposed southern flood control berm along the central drainage avoidance area avoids the existing braided channel network at the western end of the proposed berm, but would redirect flows along the eastern end of the berm.

Similarly, the southern-most drainage avoidance area is intended to convey flows from the southern box culvert that drains to a braided channel network along Rasor Road through the South Arrays (Figure 3.19-8). The proposed northern flood protection berm associated with this drainage area would intercept and redirect flows within the braided channels just north of Rasor Road along the eastern end of the proposed berm. The southern flood protection berm associated with this drainage area would also intercept and redirect flows from within the southern-most array field and the existing up-gradient hills south of the array. While this southern sub-watershed is relatively small, the design of this proposed flood protection berm has not been fully developed.

The proposed flood protection berms located to the north and south of the central drainage avoidance area and to the north of the southern drainage avoidance area are within the active braided drainage channel network. These berms, as proposed, would be placed within the 100-year flood hazard area and would alter existing drainage patterns. In addition, the flood protection berm proposed for the south side of the southern drainage avoidance area would also alter existing drainage patterns. This berm is similar to the berm proposed for the North Array in that it would redirect flows from the upgradient mountains and the southern-most solar array field after those flows have passed through the array field. While not as large as the watershed that passes through the North Array, the estimated 100-year design discharge is 884 cfs, representing a substantial redirection of flood flows. These potential effects relating to the redirection of flood flows within the South Arrays could substantially alter sediment transport as the drainage from the South Arrays is conveyed directly to the existing dune fields south of the project site that support critical habitat for the endangered fringe toed lizard. If existing drainage pathways are altered, erosion and sediment transport from the South Array area could be substantially affected.

Construction Corridors and Access Roads. The proposed construction methods for the construction corridors and the temporary access roads include the clearing of vegetation and the removal of existing boulders. Both of these actions would affect the existing desert pavement, which limits erosion until the exposed finer grained materials erodes down to lower gravel and boulder materials. Erosion from areas impacted by the temporary access roads and construction corridors would increase as a result of the proposed construction methods. This effect is expected to be temporary and is not expected to significantly alter long-term sediment delivery to Mojave Dunes (see Section 3.4, *Biological Resources - Wildlife*, for further discussion). The proposed permanent access roads are expected to include compaction and possibly gravel surfacing. This additional treatment, in particular surface treatment with gravel, is expected to reduce erosion to minimal levels. The proposed construction access corridors and temporary and permanent access roads also would cross numerous existing braided drainage channels. At each of these crossings, there is the potential that drainage patterns could be altered or structures could be placed within channels that would impede or redirect flood flows. Blocking existing drainage channels could result in increased erosion or flood related impacts to Project structures.

Construction of the proposed array fields, substation, and permanent access roads would increase impervious surface area within the Project site and could be expected to increase runoff locally. However, the Project does not include construction of substantial areas of directly connected impervious surface. By allowing runoff to infiltrate into the surface under the solar array fields, post-development runoff flow rates and volumes are not anticipated to significantly change from the pre-development runoff values.

Effects to Drainage, Erosion, and Sediment Transport. Pre- and post-development runoff rates, volumes, and peak discharges have not been calculated for the Project. Detailed hydrologic analyses have not been completed for the Project and would be conducted, as described above, during final design. Surveys of existing drainage channels would be performed as part of the hydrologic analysis and flow corridors and preliminary flood protection berm locations may be modified during final design (Soda Mountain Solar, LLC, 2013). Although the drainage and stormwater management approach developed for the Project is intended to ensure on-site grading

would be minimized, and major features of existing on-site drainages would be preserved, the installation of proposed facilities, including roads, fencing, and solar arrays, could interfere with existing drainage patterns on-site to an extent that results in a substantial alteration to the existing drainage pattern of the site, potentially increasing on-site and off-site peak discharges, runoff volumes, runoff rates, erosion, and sedimentation. These changes could result in altered hydrology on site or downstream, thereby causing increases in erosion and sedimentation as well as alterations to runoff flow rates and volumes.

APM 20 would ensure that, if crossing existing washes is necessary, at-grade crossings would be constructed to maintain existing flow channels and sediment transport, thereby leaving stormwater runoff volume unchanged. However, in addition to APM 20, development and implementation of a Comprehensive Drainage, Stormwater, and Sediment Control Plan would be necessary to address the potentially adverse effects associated with the proposed flood protection berms. Mitigation Measure 3.19-2 would ensure that changes to the Project site from construction and operation of the Proposed Action would not result in a net impact to downstream waterways from the alteration of on-site drainage or patterns and rates of erosion or sedimentation by requiring the applicant to develop and implement a comprehensive drainage, stormwater, and sedimentation control plan.

Decommissioning

Decommissioning of the Project would result in a minor reduction in on-site impervious structures, because on-site facilities would be removed. Removal of such facilities would not substantially affect on-site or downstream hydrology, due to the limited extent of such facilities. Similar to Project construction, decommissioning could result in alteration of on-site topography, and therefore of on-site drainage and erosion patterns. These changes could result in altered erosion and sedimentation patterns as well as changes to runoff rates and volumes. As required by Mitigation Measure 3.19-2, the Applicant would develop and adhere to the conditions of a Decommissioning Drainage, Stormwater, and Sedimentation Control Plan. Once decommissioning is complete, surface drainage and erosion on the Project site would not be substantially altered from pre-development conditions except in areas where soil has been compacted or rocks and isolated surface undulations have been removed by grading, which would be minimal in extent.

Flooding and Flood Hazards

Construction

The Project site is classified as Zone D by FEMA, “Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.” Figure 3.19-5 provides an overview of flood and erosion potential at the Project site based on site-specific investigation. The potential for damage to facilities due to on-site flooding would be exacerbated during the construction period. This is because a major flood event could occur at any time, including prior to the completion of the proposed flood protection berms on site (Figure 2-1). Therefore, unless construction practices and procedures are managed carefully, construction period flooding could result in damages to on site facilities, interference with the construction process, and potential exposure of employees to flood conditions. Implementation of Mitigation Measure 3.19-5 would minimize potential for construction period flooding to affect on-site facilities or expose people to

risk from flood hazards. Additionally, the Applicant would be required to implement Mitigation Measure 3.19-2 to minimize the potential for changes to on-site and off-site surface flows, drainage, and flooding.

Operation and Maintenance

Minimizing alterations to the existing drainage pattern of the Project site, as well as avoiding substantial alterations to the rate and volume of surface runoff, are addressed under Storm Drainage and Erosion, above. As described under Storm Drainage and Erosion, the increase in flows associated with the installation of the solar field and associated facilities between pre- and post-development 100-year peak flows would be minimal. Runoff flows would not be diverted around solar fields. The drainage plan for the Proposed Action is to preserve existing runoff patterns to the extent possible. It is not anticipated that post-development peak discharges or volumes would be significantly changed from the pre-development values. Any increase in flows as a result of the Project is not anticipated to result in a noticeable increase in surface flooding on-site or downstream, including flood depth and flood extent. However, pre- and post-development runoff rates, volumes, and peak discharges have not been calculated for the Project. Detailed hydrologic analyses have not been completed for the Project and will be conducted, as described above, during final design. Mitigation Measure 3.19-2 would ensure that changes to the site from Project implementation do not result in a net impact to on-site or downstream waterways by requiring the Applicant to develop and implement a comprehensive drainage, stormwater, and sedimentation control plan.

As described in Section 3.19.2.2, I-15 bisects the major basins (A and B) within the Project site and redirects the historic stormwater runoff flow patterns that existed before the interstate was constructed. I-15 acts as a structure that collects stormwater runoff. The collected stormwater runoff then passes through existing culvert locations under the highway. Two major outlet channels exist at the site, as described in detail in Section 3.19.2.2, one for each of the major basins. Basin A drains into a major channel along the west side of I-15 and outfalls at the northeastern end of the site. Basin B drains to a major channel on the east side of I-15 and outfalls to the southeast end of the Project site. These channels are classified as Zone D by FEMA, “Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.” To determine if these existing major drainage channels represent a flood hazard, they were modeled for the 100-year storm event using the Army Corps of Engineers Hydrologic Engineering Centers River Analysis System (HEC-RAS) software (RMT, Inc., 2011a). The HEC-RAS simulations indicate that these channels do not represent a flood hazard to the Project site.

Decommissioning

Decommissioning of the Project would result in a minor reduction in on-site impervious areas and structures. Decommissioning would remove structures and people from areas that may be subject to flood related hazards. Effects during decommissioning would be similar to construction. Removal of such facilities would not substantially affect on-site or downstream hydrology. However, decommissioning could result in alteration of on-site topography and drainage patterns, which could affect downstream areas on-site or off-site in a manner similar to that described under Construction, above. The Applicant would be required to implement Mitigation Measure 3.19-5 to minimize the potential for decommissioning period flooding to affect on-site facilities or expose people to risk

from flood hazards. Additionally, the Applicant would be required to implement Mitigation Measure 3.19-2 to minimize the potential for changes to on-site and off-site surface flows, drainage, and flooding. After decommissioning is completed, no further effects would occur.

3.19.6.2 Alternative B

The footprint of Alternative B would be within the footprint analyzed for the Proposed Action, with the exception of the southern alignment of Rasor Road. However, the total area of disturbance under Alternative B would be reduced as described in Chapter 2.

Construction of Alternative B is estimated to be phased over approximately 18 to 22 months. Daily water consumption during construction would be approximately the same as the Proposed Action (200,000 gpd), resulting in a total of 283 to 354 AF throughout the construction period.

During operation and maintenance, Alternative B would require 4 AFY for panel washing and 19 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the same as for the Proposed Action, resulting in a total consumption of approximately 25 AFY for all uses throughout operation and maintenance.

Under Alternative B, Wells W-3 and W-4 would be developed, but W-1 would not be developed. As described in Section 3.19.6.1, simulations were conducted for single-well and three-well scenarios to evaluate the feasibility of obtaining sufficient water with acceptable drawdown under these scenarios. Model results conclude that a single well could support construction water demand under high-end recharge parameters but would be inadequate under a low-end recharge and low-end hydraulic conductivity scenario. If wells W-3 and W-4 are insufficient to meet water supply demands, additional water would be trucked to the site from off-site sources. However, based on the result of groundwater supply assessments and model scenarios, it is likely that two wells would provide sufficient water supply during construction, operation and maintenance, and decommissioning.

Construction, operation and maintenance, and decommissioning of Alternative B would be anticipated to have similar effects on water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flood-related impacts, as compared to the Proposed Action, except that this alternative would result in reduced intensity of those effects due to the smaller size of the solar plant site.

3.19.6.3 Alternative C

The footprint of Alternative C would be within the footprint analyzed for the Proposed Action. However, the total area of disturbance would be reduced as described in Chapter 2.

Construction of Alternative C is estimated to be phased over approximately 20 to 25 months. Daily water consumption during construction would be approximately the same as the Proposed Action, resulting in a total of 320 to 400 AF throughout the construction period.

During operation and maintenance, Alternative C would require 4.5 AFY for panel washing and 22 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the

same as for the Proposed Action, resulting in a total consumption of approximately 28 AFY for all uses throughout operation and maintenance.

Wells W-1 and W-4 would be developed, but Well W-3 would not be developed. Similar to Alternative B, if two wells are insufficient to meet water supply demands, additional water would be obtained from off-site via truck delivery. However, based on the result of groundwater supply assessments and model scenarios, it is likely that two wells would provide sufficient water supply during construction, operation and maintenance, and decommissioning.

Construction, operation and maintenance, and decommissioning of Alternative C would be anticipated to have similar effects on water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flood-related impacts, as compared to the Proposed Action, except that this alternative would result in reduced intensity of those effects due to the smaller size of the solar plant site.

3.19.6.4 Alternative D

The footprint of Alternative D would be within the footprint analyzed for the Proposed Action. However, the total area of disturbance would be reduced as described in Chapter 2. Under Alternative D, the operation and maintenance area buildings and brine ponds would be located within an alluvial fan area that is no longer an active desert wash or drainage channel due to I-15 intersecting and re-directing historic stormflows from upgradient of the Project site. Additionally, the flood protection berm at the south end of the South Arrays would not be constructed (Figure 2-10), potentially increasing the potential for stormflow into the South Arrays. All other proposed facility locations would remain essentially the same, with the exception that Rasor Road would not be realigned.

Construction of Alternative D is estimated to be phased over approximately 17 to 21 months. Daily water consumption during construction would be approximately the same as the Proposed Action, resulting in a total of 268 to 335 AF throughout the construction period.

During operation and maintenance, Alternative D would require 3.8 AFY for panel washing and 18 AFY for dust suppression. Potable and fire suppression water needs are assumed to be the same as for the Proposed Action, resulting in a total consumption of approximately 24 AFY for all uses throughout operation and maintenance.

Construction, operation and maintenance, and decommissioning of Alternative D would be anticipated to have similar effects on water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on-site flood-related impacts, as compared to the Proposed Action, except that this alternative would result in reduced intensity of those effects due to the smaller size of the solar plant site.

3.19.6.5 Alternative E: No Action/No Project

Under Alternative E, the BLM would not authorize a ROW grant for the Project or amend the CDCA Plan to identify the site as suitable for the proposed use, and the County would not

approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities or other Project components would be constructed and no realignment and no realignment of Rasor Road would occur. Therefore, no impacts to water resources would occur. Alternative E would have no effect on water resources.

3.19.6.6 Alternative F: CEQA No Project

Under Alternative F, the BLM would approve the requested ROW grant under either Alternative A (Proposed Action), B, C, or D, and the County would deny the requested groundwater well permit application. Under this alternative, the Project would not draw groundwater from on-site wells, and instead would use an off-site source of water for potable use, dust control, panel washing, and fire protection. Under Alternative F, the type and level of impacts on water resources would be similar to those described for the Proposed Action with the exception that the Project would no longer have the potential to affect groundwater levels in the basin and Mitigation Measures 3.19-2 and 3.19-3 would not be necessary.

3.19.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under Alternative G, the BLM would not authorize a ROW grant for the Project and would amend the CDCA Plan to identify the site as unsuitable for the proposed use, and the County would not approve the Groundwater Well Permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed and no realignment of Rasor Road would occur. Therefore, no impact to water resources would occur.

3.19.7 Cumulative Effects

The geographic area considered for potential cumulative impacts to water resources (including water quality, groundwater level and supply, groundwater recharge, and stormwater drainage and flooding) includes the surface waters within the Mojave River Watershed that receive surface flow from the Project site and those areas overlying the Soda Lake Valley Groundwater Basin (Figure 3.19-6) because these are the same watershed and groundwater basin that could be affected by the Proposed Action (Figures 3.19-1 and 3.19-2).

Cumulative effects could occur during any phase of Project development, including construction, operation and maintenance, and decommissioning. The greatest potential for cumulative impacts with respect to water quality would occur if land disturbing activities (either the construction or decommissioning phases) of cumulative projects were to happen concurrently. However, the operation and maintenance phases of projects also are included in the temporal scope of cumulative impacts because minor alterations in topography and the addition of impervious surfaces could combine to produce cumulative impacts related to erosion and sedimentation.

The existing conditions described in Section 3.19.2, Regional and Local Environmental Setting, reflect the ongoing impacts of past and existing projects. It is within the context of these conditions that potential cumulative effects to water resources are considered. Section 3.1.5

(including Table 3.1-3) describes the other current and foreseeable projects included in the cumulative scenario. Two projects were identified as having the potential to cause impacts that could combine with those of the Project: the XpressWest High Speed Passenger Rail and Calnev Pipeline Expansion projects, which parallel I-15 in the Project area. These projects are shown in Figure 3.1-1.

Both the XpressWest and Calnev projects traverse the Project study corridor and are considered in this analysis of surface and groundwater resources.

During construction and operation of each of the reasonably foreseeable projects, it is anticipated that fuels, antifreeze, paints, oils, greases, and other lubricants, and various other potential water quality pollutants, similar to those discussed for direct Project impacts, would be stored or utilized on site, in support of construction and operation period activities. Handling of such materials for all cumulative scenario projects would be regulated under applicable local, state, and federal requirements, as discussed for direct and indirect effects. Adherence to these requirements would ensure that water quality effects of accidental releases of hazardous chemicals would be minimized. Minimal residual effects on water quality could occur; however, they would be expected to be discrete in nature, associated with isolated incidents (e.g., accidental spills), and generally of low occurrence due to the nature of projects anticipated, and therefore, do not represent major hazardous materials users or manufacturers.

Construction and operation of each of the reasonably foreseeable projects would result in the temporary and permanent conversion of desert lands to industrial and commercial uses from the installation of facilities and other earthworks, including the installation of new impervious surfaces, various grading activities, and facilities installations that, independently or collectively, could alter on-site drainage patterns. Concurrent alteration of stormwater flows and drainage patterns could result in increased erosion and sedimentation. Construction, operation and maintenance, and decommissioning of the Proposed Action or an alternative could contribute to cumulative water quality impacts related to drainage and erosion. However, SWPPPs and erosion control practices like those that would be required of the Project are standard construction industry practice, legally required for projects over specified thresholds, and reflect limits that are set with cumulative conditions in mind. The Calnev and XpressWest Projects are large-scale linear projects traversing the study area and would not result in a large amount of impervious surface that could concentrate and redirect stormwater flow causing on-site erosion, and would incorporate specific BMPs as part of a formal SWPPP during construction phases (BLM, 2011) as well as use of erosion control devices and topsoil BMPs in the case of the Calnev pipeline (BLM, 2012). As a result, related cumulative effects are not anticipated to be substantial.

With respect to groundwater levels and supplies, potential reasonably foreseeable projects would include all projects that would extract groundwater from the same aquifer at any point beginning when the Project withdrawal begins and concluding when Project withdrawals cease. Reductions in groundwater levels and supply could occur either at the Project site or elsewhere if cumulative groundwater use results in intersecting cones of depression that adversely affect other water supply wells or water features. The only reasonably foreseeable projects that cross the basins affected by the Project are the XpressWest and Calnev projects; however, neither proposes to use groundwater

from the same basins affected by the Proposed Action. As described in the stipulations contained in the Record of Decision for the XpressWest project, no new groundwater wells will be developed for the project without additional environmental review. Similarly, while the Calnev project would use up to 71 acre-feet of groundwater during construction, none of the water would be drawn from the basins underlying the Proposed Action (BLM, 2012). Therefore, within the relevant area, the amount of groundwater drawdown would be determined solely by the Proposed Action.

With respect to groundwater recharge, the installation of new impervious surfaces can in some cases result in reductions in ground surface infiltration capacity, potentially causing reductions in net groundwater recharge at any stage of the Project. Reductions in groundwater recharge could occur if the combined amount of impervious surfaces associated with the cumulative projects results in a lowering of recharge rates sufficient to result in reductions to groundwater levels, supply, or storage within the basin. The only reasonably foreseeable projects that cross these basins are the XpressWest and Calnev projects; however, these infrastructure projects would not result in extensive development of new impervious surfaces for the same reasons the Project's new impervious surfaces would be minor compared to the size of the Project site. As discussed under the assessment of direct and indirect effects, above, the Project is not expected to interfere with stormwater infiltration: rainfall incident on the panels would fall to the ground, which would remain pervious, and be permitted to infiltrate. Infiltration of stormwater would be prevented from occurring within the impervious areas of associated facilities related to all phases of the described projects. However, areas surrounding these project sites would not be affected, and would remain pervious. Therefore, the potential effects of the cumulative impervious surfaces would be minimal in comparison to the overall infiltration capacity of the groundwater basin and surrounding areas. Groundwater recharge would not be substantially reduced or adversely affected.

With respect to stormwater drainage, drainage system capacity, and flooding, the XpressWest, and Calnev projects were considered because they are located in the same watershed as the Project. These infrastructure projects would not result in extensive development of new impervious surfaces because they are linear projects that would occupy a small corridor relative to the surrounding landscape. New impervious surfaces could include access roads, some new buildings, and other areas; however, it is expected that runoff from these areas would be controlled through the implementation of the same or similar BMPs and other stormwater pollution prevention requirements to which the Project would be subject. The minor residual effects caused by cumulative increases in drainage and flooding-related effects would be dispersed throughout the watershed, and so would not rely on a single tributary or drainage structure or facility in order to convey stormwater and flood flows.

3.19.8 Mitigation Measures

Mitigation Measure 3.19-1: Brine Pond Design. The proposed brine ponds used for evaporation of reverse osmosis reject water shall include berms or levees that reach at least 2 feet above the highest anticipated flood flows during a 100-year storm event, or at least 2 feet above the highest adjacent ground, whichever is greater, in order to protect the brine ponds from incident flooding events and ensure that the ponds are not inundated by flood flows.

Mitigation Measure 3.19-2: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan. The Applicant shall prepare a Comprehensive Drainage, Stormwater, and Sedimentation Plan (Plan) prior to the initiation of construction (or decommissioning as relevant). Detailed hydrologic analysis will be performed prior to final design of the Project. Results of these analyses will be submitted to the BLM and County for review. All proposed grading and impervious surfaces on site shall be reviewed and approved by the BLM and County, with respect to its potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation. The Plan shall include, but not be limited to, the following measures:

1. All boulders and cobbles removed from construction access corridors and temporary access roads shall be stockpiled adjacent to the construction access corridors and temporary access roads. At the completion of construction, these boulders and cobbles shall be distributed on the surface of the construction access corridors and temporary access roads to help protect the exposed fine grained materials.
2. Construction of construction access corridors and temporary and permanent access roads shall not block existing drainage channels and shall not significantly alter the existing topography.
3. The Applicant shall delineate the active drainage channels within each drainage avoidance area, and avoid placement of proposed flood protection berms within active drainage channels. The drainage avoidance areas shall protect no less than 90 percent of the area of the active drainage channels from construction impacts.
4. The Applicant shall prepare hydraulic analyses that estimate the pre- and post-development peak discharges, water depths, and velocities for both smaller, more frequent events (2-, 5-, and 10-year events), as well as larger design storm events (100-year event) that would flow through each solar array field, drainage avoidance area, and/or on either side of each proposed flood protection berm. If hydraulic analyses indicate that flow depths and/or velocities may potentially be substantially altered for smaller, more frequent events, sediment transport analyses shall be performed to estimate changes in sediment transport from the South Array. Sediment transport from the South Array shall not significantly decrease as a result of the proposed project.
5. The Applicant shall provide the BLM and County design details for the flood protection berms including subgrade preparation, construction methods, and armoring or scour protection if needed (both along the drainage avoidance areas and on the array side of the berm).
6. The Applicant shall provide the BLM and County design details for Habitat Protection Fencing including how stormwater flows and debris will pass through the fencing.

Mitigation Measure 3.19-3: Groundwater Monitoring and Mitigation Plan. A Groundwater Monitoring and Mitigation Plan (Plan) shall be prepared, reviewed, and approved by San Bernardino County prior to Project approval and implementation. The County must approve the Plan prior to issuance of a groundwater well permit. The Plan shall conform to the guidelines for groundwater monitoring as detailed by San Bernardino County in the "*Guidelines for Preparation of a Groundwater Monitoring Plan*" (Guidelines) (San Bernardino County, 2000). The Plan shall be prepared by a qualified professional geologist, hydrogeologist, or civil engineer registered in the State of California and submitted by the Applicant to the County and the BLM for approval.

This Plan shall provide detailed methodology for monitoring and reporting procedures; locate monitoring, extraction and survey points; define significance criteria; and identify mitigation measures in the event that adverse impacts occur that can be attributed to the Project. The Plan shall include summarization of all monitoring data and would require submission of annual reports to the County. A comprehensive summary and analysis of data shall be included in a 5-year report. Monitoring shall be performed during pre-construction, construction, and operation of the Project, with the intent to establish pre-construction and Project-related groundwater level trends that can be quantitatively compared against observed and simulated trends near the Project pumping wells and near potentially affected existing private wells and sensitive water resources, such as Soda Spring at Zzyzx. The County will determine the duration of monitoring and reporting periods based on project conditions and monitoring data. Additionally, at each stage of reporting, the Applicant would be required to re-evaluate of the adequacy of the monitoring network and Plan.

The Plan shall include a schedule consistent with the Guidelines for submittal of data reports by the Applicant to the County and the BLM, for the duration of the monitoring period. These data reports shall be prepared and submitted to the County and the BLM for review and approval, and shall include water level monitoring data (trend analyses) from all pumping and monitoring wells. Annual data reports shall be prepared and submitted to the County and the BLM for review and approval. The annual reports must be prepared consistent with County Guidelines and contain all necessary information and data summaries.

The fifth annual report must be submitted to the County in the form of a revised Hydrogeology Report. Along with the components of the annual reports, the 5-year report shall include a re-evaluation of the hydrology of the project area based upon the monitoring data and any other information available. The 5-year report shall be prepared consistent with approved county Guidelines and submitted to the County and the BLM for review and approval.

The County and the BLM shall determine whether operating groundwater supply wells or other water resources, such as Soda Spring, surrounding the Project site are influenced by Project activities. The Plan shall describe additional mitigation measures that may be implemented if the County and the BLM determine that additional mitigation is required. Such additional measures could include curtailing or, if necessary, ceasing withdrawal of groundwater and importing a corresponding amount of water from outside of the Soda Mountain Valley, and shall be implemented as agreed upon in the Plan and with the concurrence of the County and the BLM. After the first 5 years of the Project, the Applicant and the County and the BLM shall jointly evaluate the effectiveness of the Groundwater Monitoring and Mitigation Plan and determine if monitoring frequencies or procedures should be revised or eliminated.

Mitigation Measure 3.19-4: Groundwater Testing. A ground water testing plan shall be submitted to the BLM and the County within two weeks (14 days) after the issuance of a Notice to Proceed. The testing plan shall provide for the construction of one production/test well in the South Array field as shown in the Applicant's Plan of Development. The testing for this well shall include the construction of two observation wells to be tentatively located as shown on Draft PA/EIS/EIR Figure 3.19-9. The exact location of the observation wells shall be determined by a

professional hydrogeologist in consultation with the BLM and the County. The well test shall run for 72 hours or as determined by the BLM and the County. All necessary permits for the well test shall be obtained from the Regional Water Quality Control Board, prior to initiation of the well test.

The results of the well test, specifically the level of draw down within the observation wells, shall be provided to the BLM and the County within five (5) days of the completion of the test. If the results of the test indicate a significant drawdown in the aquifer that may affect the Mohave tui chub, water usage will be curtailed to a level that will not cause draw down in the aquifer and supplemental water for dust suppression shall be provided by other means, such as hauling water from an off-site source.

The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels in the observation wells, consistent with Draft PA/EIS/EIR Figure 3.19-9. The groundwater monitoring plan would also include monitoring and quarterly reporting of groundwater elevations in Soda Spring and Lake Tuendae. If the Project is shown to cause a significant decline in groundwater levels which could threaten the tui chub, an evaluation will be conducted to determine the cause and the ground water model revised.

Mitigation Measure 3.19-5: Construction period flood protection. The Applicant shall ensure that during construction, temporary construction-related structures such as roads, berms, and other facilities would be constructed so as to avoid interference with 100-year flood flows. Temporary installation of the following types of facilities shall be avoided: temporary elevated earthen structures such as roads and berms; earthen bridges or other structures within a waterway or flood conveyance that could interfere with flood flows; dams; unnecessary ditches; and other major structures that could concentrate flood flows. Additionally, to the extent practicable, the Applicant shall ensure that the construction process proceeds in a manner so as to minimize exposure of facilities to construction period flooding. Temporary ditches and trenches (such as for pipes, wires, or other infrastructure) should be completed and backfilled as quickly as possible, and should not be left open for extended periods. Drainage infrastructure, such as flood protection berms, should be installed prior to installation of the solar arrays and other facilities on site. Other facilities that may be susceptible to flood damage during construction should be managed so as to minimize construction time of those facilities.

3.19.9 Residual Effects

With the implementation of all proposed Project design features, APMs, and mitigation measures, minor residual impacts to water resources would remain.

Additionally, if as outlined under Mitigation Measure 3.19-4, the Project is required to curtail groundwater use and import water from an off-site source, the potential environmental impacts of that outcome are analyzed in this PA/EIS/EIR under Alternative F.

3.19.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G Section IX, a project would have a significant impact on water resources if it would:

a) Violate any water quality standards or waste discharge requirements;

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

c) Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site;

d) Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

f) Otherwise substantially degrade water quality;

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows;

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or

j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

3.19.10.1 Alternative A: Proposed Action

a) Impact Water-1: The Proposed Action could violate water quality standards and/or waste discharge requirements by discharging sediment or other pollutants into waterways due to increased erosion, accidental releases of RO reject water, leaching of treated wastewater, and accidental spills of fuels, oils, or other pollutants. (Less than Significant with Mitigation Incorporated)

Potentially significant impacts relating to water quality standards and waste discharge requirements are comprehensively addressed in the discussion of direct and indirect impacts in Section 3.19.6.1. Implementation of a SWPPP or BMP Plan, as would occur with implementation of APM 20 and be required under General Permit R6T-2003-004, would minimize the degradation of water quality or the violation of water quality standards, especially during major

storm events, during construction and decommissioning. Implementation of Mitigation Measure 3.19-1 and compliance with the requirements of the UPC and Title 27 would minimize the degradation of water quality or the violation of water quality standards during operation, and would reduce this potential impact to less than significant.

As described in detail in Section 3.19.7, *Cumulative Effects*, by following industry standards and legal requirements, the incremental impact of the Proposed Action would not cause or contribute to a significant cumulative impact and its incremental contribution to cumulative conditions would not be cumulatively considerable.

b) Impact Water-2: The Proposed Action would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. (Less than Significant with Mitigation Incorporated)

Impacts relating to groundwater supply and groundwater recharge are comprehensively addressed in the discussion of direct and indirect impacts in Section 3.19.6.1. Implementation of APMs 14 and 15 would ensure a comprehensive groundwater investigation is conducted, including an aquifer pump test, by a professional hydrogeologist or geologist. Implementation of APMs 17 and 18 would ensure that the groundwater model used to predict the effects of Project groundwater use would be recalibrated using the measured aquifer properties and pumping responses resulting from the aquifer test and describes conditions under which the Applicant would prepare and implement a BLM- and County-approved groundwater monitoring plan that would protect tui chub habitat with respect to possible declining groundwater levels. While a groundwater investigation (APMs 14 and 15) in conjunction with model calibration (APM 17) would quantify effects on groundwater resources and would assist in reducing uncertainty related to the limitations of groundwater modeling, the action criteria and significance thresholds detailed in APMs 17 and 18 are short term in nature (i.e. cessation of monitoring after 5 years if certain conditions are met) and action criteria may not be adequate to reduce adverse effects to water levels at Soda Spring. As described in Section 3.19.6.1, the APMs may not address adverse conditions to the surface or groundwater resources until damage has occurred. **Mitigation Measure 3.19-3** would supplement the APMs to further ensure that adequate monitoring and reporting are completed on a reasonable schedule to avoid damage to the groundwater and surface water resources, especially at Soda Spring and would reduce this potential impact to less than significant. As discussed in Section 3.19.6.1, the potential effects of the proposed impervious surfaces would be minimal in comparison to the overall infiltration capacity of the Project site and surrounding areas. Groundwater recharge would not be reduced or adversely affected during construction or operation and maintenance of the Project, and would return to preexisting conditions after decommissioning of the Project. Impacts would be less than significant.

As described in detail in Section 3.19.7, *Cumulative Effects*, the amount of groundwater drawdown resulting from projects considered in the assessment of cumulative effects are not expected to cause a significant cumulative effect, and the Project's contribution to cumulative conditions would not be cumulatively considerable.

c, d, and e) Impact Water-3: The Proposed Action could substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or flooding on- or off-site; and could create runoff that would exceed the capacity of existing stormwater drainage systems. (Less than Significant with Mitigation Incorporated)

Impacts relating to surface drainage, erosion, polluted runoff, and flooding are comprehensively addressed in the discussion of direct and indirect impacts in Section 3.19.6.1. For discussion of potential water quality constituents entrained by Project runoff that could degrade water quality, see criterion a, above. Implementation of Mitigation Measure 3.19-2 would ensure that impacts relating to erosion (and associated effects to water quality from sedimentation) and flooding due to alterations of existing drainage patterns are minimized or avoided during construction, operation and maintenance, and decommissioning of the Project. Stormwater drainage and flood protection facilities located on site would be designed to convey on-site flows.

As described in detail in Section 3.19.7, *Cumulative Effects*, alterations to drainage that may result in erosion from cumulatively considerable projects would be controlled through the implementation of the same BMPs and other stormwater pollution prevention requirements to which the Project would be subject. The minor residual effects caused by cumulative increases in drainage and flooding-related effects would be dispersed throughout the watershed, and so would not rely on a single tributary or drainage structure/facility in order to convey any project-induced stormwater and flood flows. The Proposed Action would not cause or contribute to a significant cumulative impact and its incremental contribution to cumulative conditions would not be cumulatively considerable.

f) The Proposed Action would not otherwise degrade water quality. (No Impact)

The potential for the Project to result in water quality degradation is evaluated under criteria a, c, and e. No further sources of water quality degradation have been identified. Because the Project would cause no impact relative to this CEQA significance threshold f, it could not cause or contribute to any related cumulative impact.

g) The Proposed Action would not place housing within a 100-year flood hazard area. (No Impact)

The Project would not involve the construction of any housing. Therefore, it would result in no impact related to the placement of housing within a 100-year flood hazard area. Because the Project would cause no impact relative to placement of housing within a 100-year flood zone, it would not cause or contribute to a significant cumulative impact related to this criterion.

h) Impact Water-4: The Proposed Action would not place within a 100-year flood hazard area structures that would impede or redirect flood flows. (Less than Significant)

The Project area has not been studied by FEMA in order to determine the extent of 100-year flooding on-site. The potential for the Project to alter 100-year flood flows is discussed under criteria c and d, and mitigation is applied to minimize the identified effects. The Project is not anticipated to significantly impede or redirect flood flows during construction, operation and maintenance, and decommissioning. This impact would be less than significant.

Because existing runoff patterns would be preserved to the extent feasible and upgradient stormwater runoff would not be diverted around solar fields, the Project would not cause or contribute to any cumulative effect related to impeding or redirecting flood flows and its contribution to cumulative conditions would not be cumulatively considerable.

i) Impact Water-5: The Proposed Action could expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam. (Less than Significant with Mitigation Incorporated)

The Project is not located within a mapped dam inundation zone (San Bernardino County, 2010). The Project would be located in an area that may be subject to overland flooding, which has been comprehensively addressed in the discussion of direct and indirect impacts in Section 3.19.6.1. On-site inundation of the solar arrays during flood periods is anticipated as a matter of Project design and could result in a significant impact. Implementation of Mitigation Measure 3.19-3 would ensure that risks relating to flooding are minimized during construction and decommissioning of the Project, reducing the severity of this impact to less than significant.

The presence of other projects in the cumulative scenario would have no effect on either the severity or the probability of flood related risk to people or structures. Such issues are site-specific and unaffected by the presence of other projects in the cumulative scenario. Accordingly, the Project would not cause or contribute to any cumulative effect with respect to these concerns.

j) The Proposed Action would not expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow. (No Impact)

The site is not located adjacent to or in close proximity to any lakes or other large water bodies that could be subject to seiche. The Project is located inland and is not subject to inundation by tsunami. Mudflows generally occur as a result of heavy rain inclement upon areas that were recently denuded of vegetation, along major drainage ways that are downstream of high topographic relief areas with highly erodible soils, or as a result of volcanic activity. These conditions do not occur on-site. Therefore, the Project would not be affected by potential tsunami, seiche, or mudflow. No impact would occur.

Because the Project is not subject to potential inundation by seiche, potential inundation by tsunami, nor potential inundation by mudflow, it would not cause or contribute to any cumulative effect with respect to these concerns.

3.19.10.2 Alternative B

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.19.10.1). Potential impacts of Alternative B would remain less than significant or less than significant with mitigation as described in Section 3.19.10.1. For the same reasons as were discussed in Section 3.19.10.1, Alternative B-specific incremental impacts also would not be cumulatively considerable.

3.19.10.3 Alternative C

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.19.10.1). Potential impacts of Alternative C would remain less than significant or less than significant with mitigation as described in Section 3.19.10.1. For the same reasons as were discussed in Section 3.19.10.1, Alternative C-specific incremental impacts also would not be cumulatively considerable.

3.19.10.4 Alternative D

CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.19.10.1). Potential impacts of Alternative D would remain less than significant or less than significant with mitigation as described in Section 3.19.10.1. For the same reasons as were discussed in Section 3.19.10.1, Alternative D-specific incremental impacts also would not be cumulatively considerable.

3.19.10.5 Alternative E: No Action/No Project

Alternative E would result in no impact on water resources because there would be no change from existing conditions.

3.19.10.6 Alternative F: CEQA No Project

a, c through j) CEQA significance determinations would be the same as described above for the Proposed Action (Section 3.19.10.1), Alternative B (Section 3.19.10.2), Alternative C (Section 3.19.10.3), or Alternative D (Section 3.19.10.4), whichever alternative were approved and developed, for these criteria.

b) Alternative F would not deplete groundwater supplies. (No Impact)

Because no groundwater wells would be developed on the Project site, Alternative F would not draw any water from the aquifer and would have no impact with respect to groundwater drawdown. Alternative F also would not cause or contribute to a significant cumulative impact in this regard.

Impact Water-F2: Alternative F would not interfere substantially with groundwater recharge. (Less than Significant)

Under Alternative F, impacts to groundwater recharge would be less than significant for the same reasons described for the Proposed Action and Alternatives B, C, and D, in Sections 3.19.10.1 through 3.19.10.4. No mitigation is recommended, and the incremental impact of Alternative F would not be cumulatively considerable.

3.19.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Alternative G would result in no impact on water resources because there would be no change from existing conditions.

References

Bedinger, M.S., Langer, W.H., and Moyle, W.R., 1984. Maps Showing Ground-Water Units and Withdrawal Basin and Range Province, Southern California, U.S. Geological Survey (in Cooperation with the California Division of Mines and Geology), Water Resources Investigations Report 83-4116-A.

Bureau of Land Management (BLM), 2012. Calnev Pipeline Expansion Project Draft Environmental Impact Statement/ Environmental Impact Report. BLM/CA/ES-2012-003+1793

BLM, 2011. Record of Decision for the DesertXpress Enterprises, LLC High-Speed Passenger Train Project. October.

Caithness Soda Mountain, LLC, 2011. Plan of Development, Soda Mountain Solar Project. March.

Calico Solar, LLC, 2011. Plan of Development. Calico Solar Project, San Bernardino County, California. March.

Department of Water Resources, State of California, 2003. Ground-Water Basins of California, A Report to the Legislature in Response to Water Code Section 12924. Bulletin 118.

Department of Water Resources, State of California, 2004. Soda Lake Valley Groundwater Basin. California's Groundwater Bulletin 118.

Department of Water Resources, State of California, 1980. Ground-Water Basins of California, A Report to the Legislature in Response to Water Code Section 12924. Bulletin 118.

Diaz Yourman & Associates (DYA), 2010. Preliminary Geotechnical Investigation (Phase 1), Soda Mountain Solar Project. March 1.

Environmental Science Associates (ESA), 2013. Soda Mountain Solar Project - Stormwater Management Plans. July.

Panorama Environmental, Inc., 2013a. Water Supply Assessment Soda Mountain Solar Project San Bernardino County, California. January.

Panorama Environmental, Inc., 2013b. Correspondence with Lahontan Regional Water Quality Control Board. Meeting Notes with LRWQCB to Introduce Project. November 13, 2012.

RMT, Inc., 2011a. Preliminary Hydrology Study Report (Revised), Soda Mountain Solar Project. March.

RMT, Inc., 2011b. Hydrogeologic Conditions and Groundwater Modeling Report, Soda Mountain Solar Project. March.

RMT, Inc., 2011c. Geologic Field Reconnaissance Report: Percolation, Stormwater Runoff, and Channel Scour Potential, Soda Mountain Solar Project. April.

San Bernardino County, 2003. Storm Water Management Program (SWMP) for the Mojave River Watershed. August.

San Bernardino County, 2010. San Bernardino County Land Use Plan, General Plan Hazard Overlays. March.

San Bernardino County, 2011. Multi-Jurisdictional Hazard Mitigation Plan Update. FEMA Approval October 11, 2011.

San Bernardino County, Department of Environmental Health, 2007. Minimum Setback and Location of Septic System. April.

San Bernardino County, Department of Public Health, Division of Environmental Health Services 1992. On-Site WasteWater Disposal System. Soil Percolation (PERC) Test. Report Standards: Suitability of Lots and Soils for Use of Leachlines or Seepage Pits. August.

San Bernardino County, Public and Support Services Group, Land Use Services Department, 2000. Guideline for Preparation of a Groundwater Monitoring Plan. June.

Sax, J.L., 2002. Review of the Laws Establishing the SWRCB's Permitting Authority over Appropriations of Groundwater Classified as Subterranean Streams and the SWRCB's Implementation of those Laws, Final Report. SWRCB Document No. 0-076-300-0. [http://www.waterrights.ca.gov/hearings/SaxReport/SubStreamRpt(2002-01-20).pdf]

Soda Mountain Solar, LLC, 2012. Groundwater Well Permit Application, Soda Mountain Solar Project, San Bernardino County, California. September.

Soda Mountain Solar, LLC, 2013. Response to Data Request #2. March.

TRC Solutions, 2013. Hydrogeological Conditions and Groundwater Modeling Report Addendum (May).

U.S. Army Corps of Engineers (USACE), 2013. Approved Jurisdictional Determination regarding presence/absence of geographic jurisdiction.

U.S. Geological Survey (USGS), 1955. Data on Water Wells in Coyote, Cronise, Soda, and Silver Lake Valleys, San Bernardino County, California. Open-file report. 16 p.

Wilson Geosciences, Inc., 2011. Geologic Characterization Report, Soda Mountain Solar Project. March.

Wilson, J.L. and Guan, H. 2004. Mountain Block Hydrology and Mountain-Front Recharge. In *Groundwater Recharge in a Desert Environment: The Southwestern United States*, edited by Fred M. Phillips, James Hogan, and Bridget Scanlon. 2004: Washington DC.

Western Regional Climate Center (WRCC), 2012. Climate Data for Baker, CA. October 31, 2012.

3.20 Wildland Fire Ecology

3.20.1 Introduction

This section was developed using information from Section 3.3, *Biological Resources – Vegetation* and the WEMO Plan (BLM, 2005). The study area for Wildland Fire Ecology constitutes an area approximately 1 mile larger than the boundary of the Project site, capturing the greatest extent of any likely wildfires near the Project. Fire risk in the study area is moderate with most fires in the WEMO Plan area caused by lightning or vehicles.

3.20.2 Regional and Local Environmental Setting

The behavior and characteristics of wildfires are dependent on a number of biophysical and anthropogenic (human-caused) factors. The biophysical variables are fuels (including composition, cover, and moisture content), weather conditions (particularly wind velocity and humidity), topography (slope and aspect), and ignition sources (e.g., lightning). The anthropogenic variables are ignitions (e.g., arson, smoking, and power lines) and management (wildfire prevention and suppression efforts).

Vegetation with low moisture content is more susceptible to ignitions and burns more readily than vegetation with higher moisture content. Grasses tend to ignite more easily and burn faster, but tend to burn for a shorter duration than woody vegetation such as shrubs and trees. Continuity of fuels helps sustain wildland fires. Dense vegetation tends to carry a fire farther than patchy vegetation. The presence of invasive annual grasses, however, can provide fuel connectivity in patchy desert shrublands that would otherwise provide inconsistent fuel for a wildland fire. High winds provide oxygen to wildfires and can also blow glowing embers off burning vegetation to areas far ahead of the front of a fire, allowing fires to jump fuelbreaks in some cases. Conditions of low relative humidity will dry out fuels, increasing the likelihood of ignition. Finally, steep slopes and slopes with exposure to wind will carry fires rapidly uphill, and fires that are extinguished in mountainous areas are often contained along ridgelines.

As presented in Table 3.3-2, Mojave creosote bush scrub is the principal natural vegetation-fuel type in the study area, occupying approximately 99 percent of the Project site, with remaining land cover characterized as developed lands (Panorama Environmental, Inc., 2013). Mojave creosote bush scrub is not fire-adapted (i.e., responds favorably to fire). Fire, particularly repeated wildfire, tends to deplete the native woody shrubs that characterize and dominate this vegetation community replacing it with exotic weedy annuals. The distribution of Mojave creosote bush scrub in the study area is shown in Figure 3.3-1.

Desert scrub communities are the dominant community type in the WEMO Planning Area, with creosote bush scrub and saltbush scrub occupying 75 percent of natural lands (BLM, 2005), and much of this area on public lands. Major threats to this community type include fire, grazing, OHV use, and invasions of alien species. Compared to other parts of the state, there are relatively few fires in the WEMO Plan area and most are small. None of the lands in the study area appear to have burned in recent history.

In an in-depth analyses of the correlations between invasive annual plants and environmental disturbance impacts, Brooks (1999) found that, despite representing only 5 percent of the annual plant species in the desert, two invasive annual grasses, red brome (*Bromus madritensis ssp. rubens*) and Mediterranean split grass (*Schismus spp*.), and one invasive forb, filaree (*Erodium cicutarium*), accounted for 66 percent of total plant biomass during a high rainfall year. All three species occur in the study area. Invasive annual grasses contributed greatly to fire fuels, and combustion of dry red brome produced flame lengths and temperatures sufficient to ignite perennial shrubs. Brooks (1999) also showed that soil nutrients played a significant role and that nitrogen deposition may enhance the rate of invasion. Exotic and invasive weedy annual plants such as Mediterranean splitgrass and red brome form a complete ground cover in some portions of the study area, where disturbances such as livestock grazing, OHV use, development, and fire have contributed to the spread of exotic annuals by displacing native annual and perennial grasses and forbs.

The southern portion of the Project site is crossed by Rasor Road, an unpaved recreational access road and OHV route that traverses the south Soda Mountains. This is the area most likely to support or carry wildfires in the study area.

The BLM and NPS have collaborated in the development of the *Fire Management Plan (FMP) for the California Desert,* which brings together fire management goals for biological resources, wilderness, and other sources. The FMP establishes fire management standards and prevention and protection programs as well as limitations on fire suppression methods in critical habitat and other tortoise habitat which are designed to limit habitat disturbance while keeping fires small.

In accordance with the FMP, wildfire suppression should occur with as minimum surface disturbance as practical in all habitats. Wildfires are suppressed using a mix of only the following methods in order to minimize habitat disturbance:

1. Aerial attack;
2. Crews using hand tools to create fire breaks;
3. Mobile attack engines limited to public roads, designated open routes, and routes authorized for limited-use;
4. Use of foam and/or fire retardant;
5. Use of earth-moving equipment or tracked vehicles (such as bulldozers) in critical situations to protect life, property, or high-value resource; and/or
6. Post fire-suppression mitigation includes rehabilitation of firebreaks and other ground disturbances and obliteration of vehicle tracks sufficient to discourage future casual use. Hand tools are used for rehabilitation activities whenever feasible.

Fire Hazard Severity Zones (FHSZs) are areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors that have been mapped by the California Department of Forestry and Fire Protection (CAL FIRE). FHSZs are ranked from moderate to very high and are categorized for fire protection as within a federal responsibility area (FRA) under the jurisdiction of a federal

agency, within a state responsibility area (SRA) under the jurisdiction of CAL FIRE, or within a local responsibility area (LRA) under the jurisdiction of a local agency. The Project is located in a FRA under the jurisdiction of the BLM. The BLM would be first responder for wildland fires and the County for structures. The Project is wholly within a moderate FHSZ (CAL FIRE, 2007).

There are no residences or other sensitive receptors located within the Project boundary or in the immediate vicinity of the Project site. The nearest sensitive receptors to the Project site is the service station located at the Rasor Road exit on I-15.

In summary, fire risk in the study area as well as the potential for a major fire in the surrounding area is moderate.

3.20.3 Applicable Laws, Regulations, Plans, and Standards

3.20.3.1 Federal

CDCA Plan

The CDCA Plan (BLM, 1999, Table 1) requires that in all areas designated Multiple Use Class L, M, or I, fire suppression measures be taken in accordance with specific fire management plans subject to such conditions as the authorized officer deems necessary, such as the use of motorized vehicles, aircraft, and fire retardant chemicals.

Federal Energy Regulatory Commission

FERC requires utilities to adopt and maintain minimum clearance standards between vegetation and power lines. These clearances vary depending on voltage. In most cases, however, the minimum clearances required in state regulations are greater than the federal requirement. In California for example, the state has adopted General Order 95 rather than the North American Electric Reliability Corporation (NERC) Standards as the electric safety standard for the state. Since the state regulations meet or exceed the FERC standards, the FERC requirements are not discussed further in this section, as compliance with the state requirements will ensure that the federal requirements are met.

Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995 and updated in 2001 by the National Wildfire Coordinating Group (NWCG), a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgement of the essential role of fire in maintaining natural ecosystems. The Federal Wildland Fire Management Policy and its implementation are founding on the following guiding principles:

1. Firefighter and public safety is the first priority in every fire management activity.
2. The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.

3. Fire management plans, programs, and activities support land and resource management plans and their implementation.
4. Sound risk management is a foundation for all fire management activities.
5. Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.
6. Fire management plans and activities are based upon the best available science.
7. Fire management plans and activities incorporate public health and environmental quality considerations.
8. Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
9. Standardization of policies and procedures among federal agencies is an ongoing objective. (NWCG, 2001)

International Fire Code

Created by the International Code Council, the International Fire Code addresses a wide array of conditions hazardous to life and property including fire, explosions, and hazardous materials handling or usage. The International Fire Code places an emphasis on prescriptive and performance-based approaches to fire prevention and fire protection systems. Updated every 3 years, the International Fire Code uses a hazards classification system to determine the appropriate measures to be incorporated in order to protect life and property (often, these measures include construction standards and specialized equipment).[1] The International Fire Code uses a permit system based on hazard classification to ensure that required measures are instituted.

North American Electric Reliability Corporation Standards

The NERC is a nonprofit corporation comprising 10 regional reliability councils. The overarching goal of NERC is to ensure the reliability of the bulk power system in North America. To achieve its goal, the NERC develops and enforces reliability standards, monitors the bulk power systems, and educates, trains, and certifies industry personnel (NERC, 2013). In order to improve the reliability of regional electric transmission systems and in response to the massive widespread power outage that occurred in the Northeast in 2003, NERC developed a transmission vegetation management program that is applicable to all transmission lines operated at 200 kV and above to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the electric system in the region. The plan, which became effective on April 7, 2006, establishes requirements of the formal transmission vegetation management program, which include identifying and documenting clearances between vegetation and any overhead, ungrounded supply conductors, while taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, fire risk, line

[1] The most recent update of the International Fire Code was in 2012; it can be found online at http://publicecodes.cyberregs.com/icod/ifc/2012/.

terrain and elevation, and the effects of wind velocities on conductor sway (NERC, 2006). The clearances identified must be no less than those set forth in the Institute of Electrical and Electronics Engineers (IEEE) Standard 516-2003 described below.

Institute of Electrical and Electronics Engineers Standard 516-2003

The IEEE is a leading authority in setting standards for the electric power industry. Standard 516-2003, *Guide for Maintenance Methods on Energized Power Lines* (IEEE, 2003), establishes minimum vegetation-to-conductor clearances in order to maintain electrical integrity of the electrical system.

3.20.3.2 State

There are no state laws or regulations relating to wildland fire that apply to the Project.

3.20.3.3 Local

The Victorville Fire Protection office is responsible for fire code compliance for new construction at the Project site. The County incorporates National Fire Protection Association (NFPA) 1142 and NFPA 13 by reference and, therefore, these are the applicable standards for San Bernardino County. NFPA 1142 provides the minimum required water supply for firefighting where no public water supply is available, and NFPA 13 provides the minimum requirements for sprinkler systems.

3.20.4 Analytical Methodology

This analysis assesses the size, location, and environmental setting of the Proposed Action and alternatives; the number of vehicles that would access the site for construction, operation, maintenance, and decommissioning activities (which influence the incidence of human-vehicle and equipment-caused wildfire), and the primary causes of fire in the area, which are lightning and vehicles. Vehicle and equipment estimates are from Section 3.16, *Transportation and Travel Management*.

3.20.5 Applicant Proposed Measures

The Applicant has proposed APMs to reduce or avoid potential environmental impacts that could result from the Proposed Action or alternatives (see Section 2.4.6 and Table 2-5). Although there are no APMs specifically to address potential impacts related to wildland fire ecology, APMs intended to reduce potential impacts to vegetation also would reduce impacts related to wildland fire ecology. See, for example, APM 50, which includes the development and implementation of an Integrated Weed Management Plan (a draft is included as Appendix E-2).

3.20.6 Direct and Indirect Effects

3.20.6.1 Alternative A: Proposed Action

Construction

During construction, heavy equipment and passenger vehicles driving on vegetated areas prior to clearing and grading could increase the risk of fire. Heated mufflers or improper disposal of cigarettes could ignite surrounding vegetation. Ignition of fuels during construction could occur anywhere in within the Project site or disturbance areas for access roads. Direct impacts of wildfire would include mortality of plants and wildlife and loss of forage and cover. Annual plants and burrowing wildlife would be less affected in the short term because seeds in the soil and animals under the soil would not likely be impacted. Indirect impacts would result in changes to the vegetation communities and the wildlife supported by these communities. The spread of invasive plants, especially annual grasses, creates an increased potential for wildfires which can result in disastrous ecological change.

The probability of a wildfire to occur as a result of Project construction would be low due to the moderate-risk site conditions, patchy fuel distribution, dry climate, and the proposed level of heavy equipment use. However, during extreme weather conditions, a grass fire originating at the site could spread up the slopes of the adjacent Soda Mountains or spread toward other projects and pose a risk to life and property.

The occurrence of wildfires in the area has historically been low; however, repeated fires are known to decrease the perennial plant cover and to aid some invasive annual plants. In turn, where they gain widespread propagation, these invasive plants would provide fuel to carry flames, potentially resulting in larger fires in the future. Surface disturbing activities and vehicle use that promotes the introduction of invasive plants would increase this likelihood. Such impacts could occur within the fence and beyond. If the introduction of invasive, non-native plants is not controlled during construction, over time the Project site could become dominated with non-native plants that tend to increase the frequency and severity of wildfires. The proposed vegetation management measures described in Section 3.3, including an Integrated Weed Management Plan (APM 50, Mitigation Measure 3.3-2), would minimize the potential for weed colonization and dominance on the site by including implementation of a risk assessment of the invasive weed species currently known within the study area, procedures to control their spread on site, and procedures to help minimize the introduction of new weed species. Implementation of these measures would not completely eliminate the introduction of invasive plants to the study area, but would minimize their introduction and control their spread on the Project site.

During construction, a water truck or other portable trailer-mounted water tank would be kept on site and available to workers for use in extinguishing small man-made fires. Fire watches would be required during hot work on site (e.g., welding, soldering, cutting, drilling, or grinding).

Mitigation Measure 3.20-1 requires the Applicant to prepare and implement a Fire Safety Plan that incorporates the use of appropriate fire protection equipment, worker training, and

consultation with local fire departments to identify appropriate protocols and procedures for fire prevention and early response to minor fire. These measures would minimize the potential for a wildfire ignition to occur as a result of Project-related construction activities and the presence of personnel on site.

Operation and Maintenance

Wildfires are rare in the study area, but can be ignited by lightning, human activities, and transmission line-related fire hazards. The increase in daily vehicle use in the area from workers and machines during operation and maintenance could increase the risk of ignition. Combustible materials that would be stored and used at the solar plant include diesel fuel for vehicles and equipment, and hydraulic fluid in tracker drives, if applicable. Storage and use of these materials would be performed in accordance with applicable fire code and hazardous materials regulations. During operation and maintenance of the Project, fire protection systems for the solar plant site would include a fire protection water system for protection of the operation and maintenance building and portable fire extinguishers. The fire protection water system would be supplied from an approximately 22,500-gallon tank for fire suppression to be located near the operation and maintenance building. The Applicant would be required to comply with vegetation clearance requirements around structures at the site. In addition, temporary and permanent roads across the Project site would break the continuity of fuels at the site, which would slow or stop the progression of potential wildfires originating at the site.

Vegetation management of the plant site and linear facilities would control noxious weeds and minimize the potential for vegetation that could ignite. The proposed weed management plan and other vegetation management measures required during operation and maintenance (see Section 3.3) would minimize the potential for weed colonization and dominance on site by implementing a risk assessment of the invasive weed species currently known within the study area, control of their spread on site, and minimizing the introduction of new weed species. Additionally, fire protection would be provided through the Fire Safety Plan (Mitigation Measure 3.20-1) which would include fire prevention and suppression measures, helping reduce the risk of wildfire on and off site during operation and maintenance. While the probability of a wildfire to occur as a result of Project operation would be low due to the moderate-risk site conditions and low level of operational and maintenance activities, a wildfire that escapes control and spreads beyond the Project could result in a high level of damage to biological resources and other natural resources, such as air quality and water quality, in addition to the potential for loss of life and destruction of property.

Climate change would result in a small but general increase in temperature, and also could result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves or wetter seasons that increase fuel loads, during operation and maintenance of the Project.

Decommissioning

Impacts from decommissioning would be similar to those described for construction.

3.20.6.2 Alternative B

Alternative B would cause the same types of wildland fire impacts as the Proposed Action. However, the chance for exotic annual weeds to establish and change the fire regime in the Project Area would decrease due to the disturbance of fewer acres. Construction and decommissioning workers would be on site for a shorter period of time, reducing the likelihood of wildfire ignition due to their presence and activities. During operation and maintenance, fewer employees would be on site, and less maintenance-related vehicle and equipment use would be required. Consequently, the fire-related impacts associated with the construction of Alternative B would be reduced relative to the Proposed Action.

3.20.6.3 Alternative C

Alternative C would cause the same types of wildland fire impacts as the Proposed Action. However, the chance for exotic annual weeds to establish and change the fire regime in the Project Area would decrease due to the disturbance of fewer acres. Construction and decommissioning workers would be on site for a shorter period of time, reducing the likelihood of wildfire ignition due to their presence and/or activities. During operation and maintenance, fewer employees would be on site, and less maintenance-related vehicle and equipment use would be required. Consequently, the fire-related impacts associated with the construction of Alternative C would be reduced relative to the Proposed Action.

3.20.6.4 Alternative D

Alternative D would cause the same types of wildland fire impacts as the Proposed Action. However, the chance for exotic annual weeds to establish and change the fire regime in the Project Area would decrease due to the disturbance of fewer acres. Construction and decommissioning workers would be on site for a shorter period of time, reducing the likelihood of wildfire ignition due to their presence and/or activities. During operation and maintenance, fewer employees would be on site, and less maintenance-related vehicle and equipment use would be required. Consequently, the fire-related impacts associated with the construction of Alternative D would be reduced relative to the Proposed Action.

3.20.6.5 Alternative E: No Action/No Project

Under this no-development alternative, no changes would be implemented on the site and the existing environmental setting described in Section 3.20.2 would be maintained. The plant communities at the Project site would not be expected to change noticeably from existing conditions and, therefore, Alternative E would not result in the impacts to wildland fire ecology described for the Proposed Action or other action alternatives.

3.20.6.6 Alternative F: CEQA No Project

Alternative F would cause the same types of wildland fire impacts as the Proposed Action and Alternative B, C, or D, depending on the alternative selected by the BLM. However, the increased

presence of trucks on the Project site due to the importation of water would increase the risk of wildfire resulting from vehicle activity. Implementation of vehicle-related safety measures required under Mitigation Measure 3.20-1 would reduce this risk.

3.20.6.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

Under this no-development alternative, no changes would be implemented on the site and the existing environmental setting described in Section 3.20.2 would be maintained. The plant communities at the Project site would not be expected to change noticeably from existing conditions and, therefore, Alternative G would not result in the impacts to wildland fire ecology described for the Proposed Action or other action alternatives.

3.20.7 Cumulative Effects

Incremental impacts of the Project could result in a cumulative effect on wildland fire risk in combination with other past, present, or reasonably foreseeable future actions. For purposes of this analysis, the geographic scope of the cumulative effects analysis for fire resources consists of the Soda Mountains Range in San Bernardino County. Although potential fires would not be constrained by political boundaries, the natural conditions and existing fire response infrastructure are such that it would be reasonable to assume that a fire could be contained within this area. Impacts to wildland fire ecology from the Project would occur throughout the life of the Project, including the construction, operation, maintenance, and decommissioning phases, which could take place over 40 or more years.

The existing conditions described in Section 3.20.2 reflect that none of the lands in the cumulative study area for wildfire ecology have burned in the last century. The nearest wildfires to the Project site that were over 100 acres in size were the 63,436-acre Wildhorse fire that burned portions of the Providence Range in 2005, 37 miles east of the Project site; and the 1,064-acre Halloran fire, also in 2005, located 24 miles northeast of the Project site (NPS, 2005).

Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 3.1.5 and shown in Figure 3.1-1. Of these, three projects were identified within the cumulative study area for wildland fire ecology: the XpressWest High Speed Passenger Rail Project that parallels I-15 from Victorville to Las Vegas; the Calnev Pipeline Expansion Project that also parallels 1-15; and the Silurian Valley wind and solar projects, located approximately 8 miles northeast of the Proposed Action. For each of these projects, the installation and operation of facilities (including the transmission lines necessary to support the XpressWest project) and the use of equipment (including motor vehicles) could spark or otherwise provide an additional ignition source within the study area, potentially contributing to a cumulative increase in the likelihood of wildfires. Additionally, the increased human presence and disturbance caused by the construction, operation and overall development that would occur under the cumulative scenario could advance the rate of invasion by non-native vegetation and, thereby, contribute to fire fuel-loading that would burn with higher flames and hotter temperatures.

Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative. In this case, the incremental impact of Alternatives B, C, D, and F are not expected to differ substantially from the Proposed Action, because similar types of construction, operation and maintenance, and closure and decommissioning activities would occur.

3.20.8 Mitigation Measures

Mitigation Measure 3.20-1: The Applicant shall prepare and implement a Fire Safety Plan to ensure the safety of workers and the public during Project construction, operation and maintenance, and decommissioning activities. The Fire Safety Plan shall be provided to the BLM and the County's Victorville Fire Protection office (VFPO) for approval before the Applicant receives a Notice to Proceed (NTP). The Fire Safety Plan shall include, but not be limited to, the following elements:

1. All internal combustion engines used at the Project site shall be equipped with spark arrestors. Spark arrestors shall be in good working order.

2. Once initial two-track roads have been cut and initial fencing completed, light trucks and cars shall be used only on roads where the roadway is cleared of vegetation. Mufflers on all cars and light trucks shall be maintained in good working order.

3. Fire rules shall be posted on the project bulletin board at the contractor's field office and others areas such that they would be visible to employees.

4. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.

5. The Applicant shall make an effort to restrict use of chainsaws, chippers, vegetation masticators, grinders, drill rigs, tractors, torches, and explosives to outside of the official fire season. When the above tools are used, water tanks equipped with hoses, fire rakes, and axes shall be easily accessible to personnel.

6. Smoking shall be prohibited in wildland areas and within 50 feet of combustible materials storage, and shall be limited to paved areas or areas cleared of all vegetation.

7. Each Project construction site (if construction occurs simultaneously at various locations) and the proposed solar plant site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.

8. The Applicant shall coordinate with the VFPO to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site.

9. All construction workers, plant personnel, and maintenance workers visiting the plant and/or transmission lines to perform maintenance activities shall receive training on the proper use of fire-fighting equipment and procedures to be followed in the event of a fire. Training records shall be maintained and be available for review by the VFPO.

10. Vegetation near all solar panel arrays, ancillary equipment, and access roads shall be controlled through periodic cutting and spraying of weeds, in accordance with the Vegetation Management Plan.

11. The BLM and VFPO shall be consulted during plan preparation and fire safety measures recommended by the agencies included.

12. The plan shall list fire prevention procedures and specific emergency response and evacuation measures that would be required to be followed during emergency situations.

13. All on-site employees shall participate in annual fire prevention and response training exercises with the VFPO

14. The Applicant shall designate an emergency services coordinator from among the full-time on-site employees who shall perform routine patrols of the site during the fire season equipped with a portable fire extinguisher and communications equipment. The Applicant shall notify the BLM and County of the name and contact information of the current emergency services coordinator in the event of any change.

15. Remote monitoring of all major electrical equipment (transformers and inverters) will screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating which under certain conditions could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken.

16. Fires ignited on site shall be immediately reported to BLM FIRE and the VFPO.

17. The engineering, procurement, and construction contract(s) for the proposed project shall clearly state the requirements of this mitigation measure.

3.20.9 Residual Effects

With the implementation of all proposed APMs and mitigation measures, residual impacts related to wildland fire ecology would remain. Despite the fire and weed control programs that would be incorporated into the Project, the changes in vehicle use accessing the area for construction, operation and maintenance, and decommissioning would increase the likelihood of wildfires in the Project area to a slight, but unknown degree.

3.20.10 CEQA Significance Thresholds and Determinations

Based on the CEQA Guidelines Appendix G, Section VIII, a project would have a significant impact related to wildfire hazards if it would:

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

3.20.10.1 Alternative A: Proposed Action

h) Impact Fire-1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death. (Less than Significant with Mitigation Incorporated)

The Project site is not located in an area where wildlands are adjacent to urbanized areas, and, with the exception of one residence at the Rasor Road service station, there are no residences intermixed with wildlands in the vicinity of the Project site. As described in greater detail in Section 3.20.6, the increased presence of workers and equipment on the Project site could result in increased risk of wildfire from cigarettes, sparks, and other potential ignition sources. In the event of a wildfire originating on site, Project personnel and structures as well as off-site people and structures could be exposed to a significant risk of loss, injury, or death. The implementation of Mitigation Measure 3.20-1 would reduce the risk of exposure from wildfire to less than significant. For the reasons described in Section 3.20.7, the Project's incremental contribution to potential cumulative effects would not be cumulatively considerable.

3.20.10.2 Alternative B

h) Impact Fire-B1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death. (Less than Significant with Mitigation Incorporated)

The risk of exposure of people or structures to wildfire hazards would be of a similar type, but slightly reduced in scale compared to the Proposed Action due to the reduced size of the Project facilities and reduced area of construction, operation, and maintenance activities, but would remain less than significant with mitigation incorporated. The potential contribution of Alternative B to cumulative effects also would not be cumulatively considerable.

3.20.10.3 Alternative C

h) Impact Fire-C1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death. (Less than Significant with Mitigation Incorporated)

The risk of exposure of people or structures to wildfire hazards would be of a similar type, but slightly reduced in scale compared to the Proposed Action due to the reduced size of the Project facilities and reduced area of construction, operation, and maintenance activities, but would remain less than significant with mitigation incorporated. The potential contribution of Alternative C to cumulative effects also would not be cumulatively considerable.

3.20.10.4 Alternative D

h) Impact Fire-D1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death. (Less than Significant with Mitigation Incorporated)

The risk of exposure of people or structures to wildfire hazards would be of a similar type, but slightly reduced in scale compared to the Proposed Action due to the reduced size of the Project facilities and reduced area of construction, operation, and maintenance activities, but would remain less than significant with mitigation incorporated. The potential contribution of Alternative D to cumulative effects also would not be cumulatively considerable.

3.20.10.5 Alternative E: No Action/No Project

h) Alternative E would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. (No Impact)

Because it would involve no personnel or construction equipment on the Project site, this no-development Alternative would result in no impact related to additional exposure from fire to people or structures. Because it would cause no impact, Alternative E would not cause or contribute to cumulative effects in this regard.

3.20.10.6 Alternative F: CEQA No Project

h) Impact Fire-F1: The presence of personnel and/or equipment on the Project site could increase the risk of wildfire, potentially exposing people or structures to a risk of loss, injury, or death. (Less than Significant with Mitigation Incorporated)

Under Alternative F, the risk of exposure of people or structures to wildfire hazards would be similar to the Proposed Action and Alternative B, C, or D, depending on the alternative selected by the BLM, but slightly increased due to the increase in truck traffic on the Project site for water delivery. However, even with increased truck traffic, this impact would remain less than significant after implementation of Mitigation Measure 3.20-1. The slightly greater incremental impact relative to the other action alternatives would not be cumulatively considerable.

3.20.10.7 Alternative G: Site Unsuitable for Solar, No BLM ROW, and No County Permit

h) Alternative G would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. (No Impact)

Because it would involve no personnel or construction equipment on the Project site, this no-development alternative would result in no impact related to additional exposure to people or structures from wildfire. Because it would cause no impact, Alternative G would not cause or contribute to cumulative effects in this regard.

References

Bureau of Land Management (BLM), 1999. California Desert Conservation Area Plan, as amended.

BLM, 2005. Final Environmental Impact Report and Statement for the West Mojave Plan. [http://www.blm.gov/ca/st/en/fo/cdd/wemo.html]

Brooks, M. L., 1999. Alien annual grasses and fire in the Mojave Desert. Madrono, Vol. 46, No. 1, pp. 13-19, 1999.

California Department of Forestry and Fire Protection (Cal Fire), 2007. Draft Fire Hazard Severity Zones in L.R.A., NE San Bernardino County, October 4, 2007.

Institute of Electrical and Electronics Engineers (IEEE), 2003. Standard 516-2003, *Guide for Maintenance Methods on Energized Power Lines*.

Panorama Environmental, Inc., 2013. Biological Resources Technical Report Soda Mountain Solar San Bernardino County, CA BLM Case Number CACA 49584, March 2013.

National Park Service (NPS), 2005. Halloran Summit. [http://home.nps.gov/applications/digest/firenews.cfm?type=FireNews&postid=1617&urlarea=firemanagement] Accessed July 11, 2013.

National Wildfire Coordinating Group (NWCG), 2001. Review and Update of the 1995 Federal Wildland Fire Management Policy, Executive Summary. January. [http://www.nwcg.gov/branches/ppm/fpc/archives/fire_policy/docs/exsum.pdf]

North American Electric Reliability Corporation (NERC), 2006. Standard FAC-003-1 — Transmission Vegetation Management Program. [http://www.nerc.com/files/fac-003-1.pdf]

NERC, 2013. Programs: Critical Infrastructure Protection. [http://www.nerc.com/pa/CI/Pages/default.aspx] Accessed October 3, 2013.

3.21 Other CEQA Considerations

This section addresses CEQA considerations that are not addressed in other resource-specific sections, including energy consumption, mandatory findings of significance, significant unavoidable environmental impacts, and significant irreversible environmental changes.

3.21.1 Energy Consumption

CEQA Section 21100(b) requires that an EIR discuss and consider mitigation measures for the potential energy impacts of proposed projects, with emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Appendix F of the CEQA Guidelines provides guidance for assessing the significance of potential energy impacts. It provides three means of achieving its ultimate goal of conserving energy:

1. Decreasing overall per capita energy consumption,
2. Decreasing reliance on natural gas and oil, and
3. Increasing reliance on renewable energy sources.

Consistent with Appendix F of the CEQA Guidelines, potential environmental impacts evaluated in this section include:

1. The Project's energy requirements by amount and fuel type for each stage of the Project including construction, operation, maintenance, and decommissioning;
2. The effects of the Project on energy resources, local and regional energy supplies, and requirements for additional capacity;
3. The effects of the Project on peak and base period demands for electricity and other forms of energy;
4. The degree to which the Project complies with existing energy standards; and
5. The Project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

3.21.1.1 California's Energy System

Electricity

With a relatively mild Mediterranean climate and strict energy efficiency and conservation requirements, California has lower energy consumption rates per capita than other parts of the country. California has the fifth lowest annual electrical consumption rate per person, at approximately 70 percent of the national average (USEIA, 2013a). Nevertheless, with a population of 37.3 million people, California residents consume approximately 8.5 percent of the nation's total energy produced (USEIA, 2013a) and the state is the tenth largest consumer of energy in the world.

The production of electricity requires the consumption or conversion of energy resources including water, wind, oil, gas, coal, solar, geothermal, and nuclear sources. Of the electricity generated in California, 45.3 percent is generated by natural gas-fired power plants, 1.6 percent is generated by coal-fired power plants, 18.3 percent comes from large hydroelectric dams, and 18.3 percent comes from nuclear power plants. The remaining 16.6 percent in-state total electricity production is supplied by renewable sources including solar and wind power (CEC, 2012).

Natural gas supplies the largest portion of California's electricity market; natural gas-fired power plants in California meet approximately 37 percent of the in-state electricity demand. Most of the natural gas consumed in California comes from the Southwest, the Rocky Mountains, and Canada, while the remainder is produced in California.

California's RPS requires retail electricity sellers, including publicly owned utilities (POUs), to procure 33 percent of retail sales per year from eligible renewable sources by 2020. Currently, California receives 16.6 percent of its electricity from renewable sources including small hydroelectric generation (3.1 percent), biomass (2.9 percent), geothermal (6.3 percent), solar (0.5 percent), and wind (3.8 percent) (CEC, 2012). California leads the nation in electricity generation from non-hydroelectric renewable energy sources including geothermal power, wind power, fuel wood, landfill gas, and solar power. The state is also a leading generator of hydroelectric power (USEIA, 2012). The electricity generated and used in California is distributed via a network of transmission and distribution lines commonly called the power grid.

Petroleum

Approximately 38.1 percent of California's petroleum supply comes from in-state sources while 47.7 percent is imported from foreign sources and 14.2 percent is imported from Alaska (CEC, 2011a). California's oil fields comprise the fourth-largest petroleum producing area in the United States, behind federal off-shore production, Texas, and Alaska. Crude oil is moved within California through a network of pipelines that carry it from both on-shore and off-shore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley (USEIA, 2012). Currently, 20 petroleum refineries operate in California (USEIA, 2013b).

Most crude oil produced in California is refined within California to meet state-specific formulations required by the California Air Resources Board (ARB). The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, rail vehicles, and construction equipment; and fuel oil for industry and electrical power generation.

In 2011, California consumed approximately 642.9 million barrels (27 billion gallons) of petroleum (USEIA, 2013b). Most of this is used in on-road motor vehicles. To meet transportation-related energy demand, the state relies almost exclusively on petroleum products. The CEC estimates that an additional 20 million to 48 million barrels of transportation fuels (840 and 2016 million gallons, respectively) per year (compared to 2006 levels) will be produced by California refineries for use in the state's transportation sector by 2015 (CEC, 2007).

3.21.1.2 Local Energy Systems

Southern California Edison

Electrical services in the Project area are provided by SCE. SCE provides electricity to approximately 14 million people, 5,000 large businesses, and 280,000 small businesses throughout its 50,000-square-mile service area, which includes 180 cities across 11 counties in central coastal and southern California (SCE, 2013).

SCE produces and purchases its energy from a mix of conventional and renewable generating sources. Table 3.21-1 shows the electric power mix that was delivered to SCE's retail customers in 2011.

TABLE 3.21-1
ELECTRIC POWER MIX DELIVERED TO SCE RETAIL CUSTOMERS IN 2011

Power Source	Percent (%) of Total Power Mix Delivered
Natural Gas	27
Nuclear	24
Coal	8
Large Hydroelectric	7
Other Fossil Fuels	0
Unspecified Sources	15
Eligible Renewables (19%):	
Geothermal	9
Wind	7
Biomass and Waste	1
Small Hydroelectric	1
Solar	1

SOURCE: SCE, 2012

SCE provides electricity in the vicinity of the Project site but no electricity currently is available on-site. If distribution to the site is determined to be feasible, electric service could be extended to the site via a distribution power line that would be constructed, owned, and operated by SCE, and could replace some of the fuel use described below in Section 3.21.1.1 by replacing the use of a construction trailer generator.

Los Angeles Department of Water and Power

LADWP operates the Market Place-Adelanto 500 kV transmission line to which Project would interconnect and provides electricity to approximately 3.9 million people in a service area covering 465 square miles (LADWP, 2013).

LADWP produces and purchases its energy from a mix of conventional and renewable generating sources. Table 3.21-2 shows the electric power mix that was delivered to LADWP's retail customers in 2011.

TABLE 3.21-2
ELECTRIC POWER MIX DELIVERED TO LADWP RETAIL CUSTOMERS IN 2011

Power Source	Percent (%) of Total Power Mix Delivered
Natural Gas	17
Nuclear	11
Coal	41
Large Hydroelectric	3
Unspecified Sources	9
Eligible Renewables (19%):	
Geothermal	0
Wind	10
Biomass and Waste	3
Small Hydroelectric	6
Solar	0

SOURCE: LADWP, 2012

3.21.1.3 Energy Conservation Standards

State

California Senate Bill X1-2 is the most recent update to the state's Renewables Portfolio Standard (RPS) requirements, and requires POUs and retail sellers of electricity in California to procure 20 percent of their electricity sales from eligible renewable sources by 2013, and 33 percent by the end of 2020.

Title 24, Part 6 of the California Code of Regulations is the California Energy Code, a section of the California Building Code (CBC) that includes standards mandating energy conservation measures in new construction for heating, cooling, ventilation, water heating, and lighting. Since its establishment in 1977, these standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas usage and costs in California. The California Energy Commission produces, and the California Building Standards Commission subsequently adopts updates to these standards every 3 years to incorporate new energy efficiency technologies. The current California Energy Code became effective on January 1, 2011. The 2013 update to the Energy Code, currently under review, will take effect on January 1, 2014. The CBC is implemented through the local planning and permit process.

Local

The following policy identified in the Conservation element of the San Bernardino County General Plan is relevant to this analysis (San Bernardino County, 2007).

***Policy CO 9.2*:** The County will work with utilities and generators to maximize the benefits and minimize the impacts associated with siting major energy facilities. It will be the goal of the County to site generation facilities in proximity to end-users in order to minimize net energy use and natural resource consumption, and avoid inappropriately burdening certain communities.

3.21.1.4 Energy Consumption Impacts of the Project

Energy Requirements and Effects on Local and Regional Energy Supplies

The following analysis includes energy consumption values that are based on estimates of the Project's energy requirements through construction, operation and maintenance, and decommissioning.

Direct energy use would include the consumption of petroleum fuel for vehicles and the use of electricity for equipment and facilities. Indirect energy use includes the energy required to make the materials and components used in construction of the Project. This includes energy used for extraction of raw materials, manufacturing, and transportation associated with manufacturing. As described in Chapter 2, *Proposed Action and Alternatives*, all recyclable wastes generated during construction, operation and maintenance, and decommissioning, including PV panels, would be recycled at appropriate facilities. Through the recycling of these materials, the Project would achieve the maximum attainable recycling of depletable resources in compliance with 42 USC Section 4331(b)(6).

The precise amount of petroleum fuel demand that would be required to construct, operate and maintain, and decommission the Project is uncertain; however, for the purposes of this analysis, fuel usage in terms of gasoline and diesel have been estimated based on greenhouse gas emission estimates for the Project (see Section 3.5, *Climate Change* and the Air Quality and Greenhouse Gas Technical Report, Pan Environmental Inc., 2013) and The Climate Registry fuel use emission factors (The Climate Registry, 2011).

Construction

Although construction-related energy consumption would occur temporarily during the construction period, it would represent irreversible consumption of finite natural energy resources. Construction-related energy expenditures would include direct and indirect uses of energy in the form of fuel (typically diesel fuel for trucks and on-site equipment, and gasoline for commuter vehicles). There are currently no energy-consuming activities at the site; therefore, all energy consumption during Project construction would exceed the baseline.

Based on the GHG emissions shown in Section 3.5, it is estimated that the Project would use approximately 490,000 gallons of gasoline and 1,300,000 gallons of diesel during the construction period, or approximately 190,000 gallons of gasoline and 520,000 gallons of diesel annually. In 2012, over 14.6 billion gallons of gasoline and 2.6 billion gallons of diesel were consumed in California (BOE, 2013a, 2013b). The Project's annual construction-related gasoline

and diesel consumption would be minimal, representing 0.001 and 0.02 percent, respectively, of these statewide totals.

The Project would not draw electricity from the regional grid during construction; therefore, construction would not adversely affect local or regional electricity supplies. The Project would begin generating electricity upon the connection of the first solar arrays completed, resulting in a net increase in electricity resources available to the regional grid, and would help LADWP meet its goal of increased reliance on renewable energy sources and decreased reliance on coal power.

Operation and Maintenance

The energy-consuming activities of permanent employees would include daily trips to the site, site maintenance (roads and solar panel washing), and site security monitoring. During each year of operation, the Project would consume approximately 59,000 gallons of gasoline and 17,000 gallons of diesel. The amount of petroleum consumed during operation would be substantially less than the amount consumed during construction but would still be the primary source of the energy consumed on-site. As described above, compared to statewide annual petroleum fuel consumption, the Project's use of each of these fuel types would represent less than one thousandth of one percent.

During operation and maintenance, on-site electricity needs would be met by Project-generated electricity, and would not be drawn from the electrical grid. Therefore, it would not adversely affect local or regional electricity supplies.

The petroleum fuel and electrical energy consumed during operation and maintenance would exceed baseline conditions but still would be considered minimal, and would not be inefficient, wasteful, or unnecessary. Additionally, Project operation would have a beneficial effect on the electricity supply to the grid and would help LADWP meet its goal of increased reliance on renewable energy sources and decreased reliance on coal power.

Decommissioning

During decommissioning, most of the energy consumed on-site would be used by the petroleum-fueled construction vehicles and equipment used to dismantle the Project. If electricity were required, it would be sourced from any still-operational panels, or from on-site petroleum-fueled generators. The exact amounts of diesel and gasoline required for decommissioning are unknown. However, the amount of energy required to decommission the facility would not be significantly different than the amount of energy that would be consumed each year during construction. Using the average annual construction diesel and gasoline consumption, the 24-month decommissioning phase would consume approximately 380,000 gallons of gasoline and 1,040,000 gallons of diesel. As described above, compared to statewide petroleum fuel consumption, the Project's use of these fuel types would be minimal.

Although the energy consumed during decommissioning would be greater than the baseline amount (zero), it would be a minimal and temporary use of energy.

The energy consumed during the lifetime (including decommissioning) of the Project would be less than the energy generated throughout the lifetime of Project. Overall, the Project would produce a net energy gain. However, much of the Project's energy consumption would be in the form of petroleum fuels, whereas the energy it would produce would be in the form of electricity. These energy types are generally not interchangeable (i.e., transportation primarily uses diesel and gasoline, while air conditioning and appliances typically use electricity). Therefore, the Project would result in a net consumption of liquid petroleum fuels and a net supply of electricity to the regional grid. Additionally, decommissioning would return the Project site to its baseline conditions in which no energy would be supplied or used on-site.

Summary

The energy consumed during each Project phase would be greater than the baseline value used at the site. However, energy used during each phase of the Project would be necessary to implement the Project, and none of the proposed energy-consuming activities associated with each phase would be a wasteful, inefficient, or unnecessary use of energy. After the first phase of the Project is operational, and throughout operation, the Project would be a net electricity producer, and would have a beneficial effect during peak electricity demand periods, particularly on warm, sunny days when demand for air-conditioning increases and Project output is at its highest. Additionally, decommissioning would restore the site to baseline conditions, making it a non-energy consuming site. The Project would not have a significant impact with respect to fuel and electrical energy requirements or on local or regional energy supplies.

Compliance with Energy Standards

Construction and Decommissioning

During construction and decommissioning, the Applicant would recycle all recyclable materials at appropriate facilities, and would therefore be in compliance with 42 USC §4331(b)(6). Additionally, the use of energy during construction and decommissioning would not be unnecessary, wasteful, or inefficient because it would be necessary for the completion of the Project and because construction and decommissioning equipment would comply with all applicable fuel economy and energy efficiency standards. No adverse impact on efforts to achieve existing energy standards would result.

Operation and Maintenance

The Project would use solar energy technology, an eligible renewable energy resource that meets criteria set forth in California Public Utilities Code Section 399.12, Public Resources Code Section 25741, and *Renewables Portfolio Standard: Eligibility Guidebook* (CEC, 2011b). Electricity generated by the Project would be sold in the competitive market, most likely under the terms of a 30-year Power Purchase Agreement with LADWP. Consequently, the Project would contribute toward meeting LADWP's requirements under the Renewables Portfolio Standard. The permitting process for the Project would require that the Project comply with all applicable policies and standards. Thus, the Project would comply with, directly support, and further efforts toward achieving existing energy standards. No adverse impact on efforts to achieve existing energy standards would result.

Efficient Use of Transportation Fuels

Construction and Decommissioning

Impact Energy-1: The Project could result in an inefficient, wasteful, and/or unnecessary use of energy for transportation of materials and worker commutes. (*Less than Significant with Mitigation Incorporated*)

Construction and decommissioning of the Project would consume diesel and gasoline as described above, some of which would be used for transportation of materials and worker commutes. Although the overall use of energy for each phase of the Project is not considered inefficient, wasteful, or unnecessary, the specific use of diesel and gasoline for worker commutes and haul trips would be considered a significant adverse effect if each worker arrives at the site in a separate vehicle and haul trips are not coordinated to the extent feasible to reduce transportation energy consumption. As described in Section 3.16, *Transportation and Travel Management*, approximately 50 percent of construction workforce traffic would originate north/east of the Project site and would travel southbound on I-15 to access the Project site, and approximately 50 percent would originate south/west of the Project site and would travel northbound on I-15 to access the Project site. The site is not accessible by public transportation; therefore, it is likely that workers would travel in single-occupancy vehicles to the site. However, Mitigation Measure 3.21-1 would reduce the Project's construction- and decommissioning-related impacts on transportation energy use to a less-than-significant level by requiring the Applicant to facilitate efficient means of transportation and use of fuels by employees and haul trucks through limiting idling, implementing ridesharing strategies, and planning haul trips as efficiently as is feasible through the implementation of a Transportation Energy Management Plan.

> **Mitigation Measure 3.21-1:** The Applicant shall develop and implement a construction- and decommissioning-phase Transportation Energy Management Plan in consultation with the BLM and San Bernardino County to reduce construction- and decommissioning-related transportation energy consumption. The plan shall include but not be limited to the following measures:
>
> 1. Require that on-site equipment and vehicle operators minimize equipment and vehicle idling time either by shutting equipment off when not in use or by limiting idling time to a maximum of 5 minutes.
> 2. Register with SANBAG's Rideshare Incentives program.
> 3. Designate a Transportation Energy Manager (TEM) to coordinate ridesharing by construction and decommissioning employees. The TEM shall encourage carpooling by posting commuter ride sign-up sheets, maintaining and posting an employee home zip code map, and educating employees about how to access the incentives they may be eligible for under SANBAG's Rideshare Incentives program.
> 4. Provide priority parking on-site for vehicles with two or more passengers.
> 5. When feasible, arrange for a single construction vendor who makes deliveries for several items.
> 6. Plan construction delivery and waste hauling routes to eliminate unnecessary trips.

The plan shall be submitted to the BLM and San Bernardino County for review and approval prior to the start of construction.

Operation and Maintenance

Operation- and maintenance-related use of transportation energy would consist of employee commutes, maintenance-related vehicle use on-site, and any necessary hauling of supplies and wastes generated during this phase. Due to the low number of employees and the limited need for deliveries and waste hauling throughout the operational period, it is anticipated that transportation energy consumption would be low. The use of transportation energy for maintenance-related trips would be necessary to the maintenance of the solar plant and related facilities. Therefore, during operation and maintenance, the use of transportation energy would not be considered inefficient, wasteful, or unnecessary.

3.21.2 Mandatory Findings of Significance

Based on the CEQA Guidelines Section 15065, a project would have a significant impact if it:

a) Has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory;

b) Has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals;

c) Has possible environmental effects that are individually limited but cumulatively considerable; or

d) Has environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.

The following paragraphs describe the Project's potential to have a significant impact in each of these categories.

a) The Project's potential to substantially degrade the quality of the environment is analyzed throughout Chapter 3. As described below in Section 3.21.3, the Proposed Action would result in five significant and unavoidable impacts. All other impacts of the Proposed Action could be reduced to a less-than-significant level with the implementation of mitigation measures described in Chapter 3. Only Alternatives E and G would avoid these significant unavoidable impacts.

   As described in Section 3.3, *Biological Resources – Vegetation*, the Project would not have the potential to threaten to eliminate a plant community or substantially reduce the number or restrict the range of a special-status plant. As described in Section 3.4, *Biological Resources – Wildlife*, the Project also would not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate an animal community, or substantially reduce

the number or restrict the range of an endangered, rare, or threatened species. As described in Sections 3.6, *Cultural Resources*, and 3.12, *Paleontological Resources*, the Project would not have the potential to eliminate important examples of the major periods of California history or prehistory.

b) The Proposed Action and Alternative B through D would produce electricity from a renewable resource and would contribute to the short-term goals of meeting California's RPS targets and federal targets for renewable energy on federally managed lands. As described in Section 3.5, *Climate Change*, the production of renewable energy also would contribute to long-term environmental goals by reducing the amount of greenhouse gases that would be emitted compared to a comparably sized fossil fuel-fired power plant. This benefit would extend beyond the life of the Project due to the persistence of greenhouse gases in the atmosphere.

   The potential long-term impacts on the environment resulting from the Proposed Action or alternatives are described throughout Chapter 3, *Environmental Analysis*. Long-term impacts could include the disturbance of desert vegetation, which can take years to reestablish. Mitigation measures are proposed to avoid, minimize, or mitigate activities that would have long-term adverse environmental impacts.

c) The Project could result in environmental effects that individually are limited, but could combine with the effects of other projects to result in significant cumulative effects, and the Proposed Action's contributions to these cumulative effects would be cumulatively considerable. Such impacts are described in Sections 3.2, *Air Quality*, in which the Project could have a cumulatively considerable contribution to a significant cumulative air quality impact with respect to exceedances of the MDAQMD NO_x and PM_{10} thresholds. Additionally, even with implementation of mitigation, cumulative impacts to bighorn sheep also would be significant and unavoidable, and the Project's contribution would be cumulatively considerable. Further, in light of existing conditions and the substantial contributions of other projects to cumulative visual effects to scenic vistas (including potential cumulative impacts to night skies), the Project's incremental less-than-significant impact would be cumulatively considerable.

d) The Project's potential changes to the environment that could indirectly affect human beings are analyzed in all of the CEQA issue areas throughout Chapter 3 (e.g., Recreation). Those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, noise, population and housing, public services, transportation/traffic, utilities and public services, and hydrology and water quality, which are addressed in Sections 3.2, 3.7, 3.8, 3.11, 3.14, 3.17, and 3.18 of this PA/EIS/EIR, respectively.

3.21.3 Significant Unavoidable Environmental Impacts

Section 15126.2(b) of the CEQA Guidelines requires that an EIR identify significant environmental effects of the proposed project that cannot be avoided. The analysis contained in Sections 3.2 through 3.20 indicates that the potential environmental effects from implementation of the Project would cause significant impacts, although most of those can be reduced to a level that is below significant with mitigation measures. However, Project impacts to three resources areas cannot be reduced to a less-than-significant level, and so remain significant and unavoidable:

1. **Air Resources:** Project-specific impacts of construction- and decommissioning-related NO_x, CO, and PM10 emissions. See Impact Air-1 in Section 3.2.10.

2. **Biological Resources – Wildlife:** Project-specific and cumulative impacts to special-status, resident, and migratory birds; bighorn sheep habitat availability and movement; and special-status bats. See Impacts Wild-3, Wild-5, Wild-6, Wild-7, and Wild-9 in Section 3.4.10.

3. **Visual Resources:** Cumulative effects on scenic vistas; the existing visual character or quality of the Project site and its surroundings; and of light and glare on views (including views of the night sky) in the area. See Impacts Vis-2, Vis-4, and Vis-6 in Section 3.18.10.

Only Alternatives E and G would avoid these impacts. All other alternatives to the Proposed Action would result in significant and unavoidable impacts related to air resources, birds, bats, bighorn sheep connectivity, and cumulative daytime and nighttime views and character of the Project area.

3.21.4 Significant Irreversible Changes

Section 15126.2(c) of the CEQA Guidelines requires that an EIR identify significant irreversible environmental changes that would be caused by a proposed project. These changes may include, for example, uses of nonrenewable resources, or provision of access to previously inaccessible areas, as well as project accidents that could change the environment in the long term. Development of the Project would require a permanent commitment of natural resources resulting from the direct consumption of fossil fuels, construction materials, the manufacture of new equipment, some of which would not be recyclable at the end of the Project's useful lifetime, and energy required for the production of materials.

Accidents, such as the release of hazardous materials, could trigger irreversible environmental damage. As discussed in Section 3.8, *Hazards and Hazards Materials*, Project construction would involve limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, solvents, paints, etc. An accidental spill of any of these substances could affect water and/or groundwater quality and, if a spill were to occur of significant quantity, the release could pose a hazard to construction workers, the public, and the environment. Limited quantities of similar hazardous materials also would be used to operate and maintain the equipment and infrastructure at the Project site and along the access road route. Improper storage, use, handling, or accidental spilling of such materials could result in a hazard to the public or the environment. Due to the types and minimal quantities of hazardous materials that would be used for the Project, and the emergency response plans and other procedures that would be required by the independent obligations and recommended mitigation measures described in that section, accidental release is unlikely. State and federal regulations and safety requirements, as described in the regulatory setting in Section 3.8.3, would ensure that public health and safety risks are maintained at acceptable levels. Therefore, significant irreversible changes from accidental releases are not anticipated.

References

LADWP, 2012. Annual Report of Actual Electricity Purchases for LADWP Calendar Year 2011. [https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-powercontentlabel?_adf.ctrl-state=1by9q28mc4_88&_afrLoop=72366782844000] Accessed April 26, 2013.

LADWP, 2013. Facts & Figures. [https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-factandfigures?_adf.ctrl-state=1by9q28mc4_4&_afrLoop=71433300606000] Accessed April 26, 2013.

California Board of Equalization (BOE), 2013a. Taxable Diesel Gallons 10 Year Report Net of Refunds. [http://www.boe.ca.gov/sptaxprog/reports/Diesel_10_Year_Report.pdf]

BOE, 2013b. Net Taxable Gasoline Gallons 2003 to 2012. [http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf]

The Climate Registry, 2011. Table 13.1 US Default Co2 Emission Factors for Transport Fuels. [http://www.theclimateregistry.org/downloads/2009/05/2011-Emission-Factors.pdf]

California Energy Commission, (CEC), 2007. Transportation Energy Forecast for the 2007 Integrated Energy Policy Report. [www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF]

CEC, 2011a. California's Major Sources of Energy. [www.energyalmanac.ca.gov/overview/energy_sources.html] Accessed March 26, 2013.

CEC, 2011b. Renewable Portfolio Standard Eligibility. [http://www.energy.ca.gov/2010publications/CEC-300-2010-007/CEC-300-2010-007-CMF.PDF]

CEC, 2012a. Total Electricity System Power. [www.energyalmanac.ca.gov/electricity/total_system_power.html] Accessed March 26, 2013.

CEC, 2012b. Integrated Energy Policy Report Update. [http://www.energy.ca.gov/2012publications/CEC-100-2012-001/CEC-100-2012-001-CMF.pdf]

Pan Environmental Inc., 2013. Air Quality and Greenhouse Gas Impact Analysis, Soda Mountain Solar Project.

San Bernardino County, 2007. County of San Bernardino 2007 General Plan, as amended.

Southern California Edison (SCE), 2012. 2011 Power Content Label. [http://www.energy.ca.gov/sb1305/labels/2011_labels/SCE_PCL.pdf]

SCE, 2013. Who We Are. [https://www.sce.com/wps/portal/home/about-us/who-we-are] Accessed March 26, 2013.

U.S. Energy Information Administration (USEIA), 2012, California State Energy Profile (July). [www.eia.gov/state/state-energy-profiles.cfm?sid=CA] Accessed March 26, 2013.

USEIA, 2013a. State Ranking 7. Total Energy Consumption Per Capita, 2010 (million Btu). [www.eia.gov/state/state-energy-rankings.cfm?keyid=60&orderid=1] Accessed March 26, 2013.

USEIA, 2013b. California Data. [http://www.eia.gov/state/state-energy-profiles-data.cfm?sid=CA] Accessed March 26, 2013.

CHAPTER 4
Consultation, Coordination, and Public Involvement

4.1 Interrelationships

The BLM's primary authority for the Proposed Action is FLPMA (43 USC §1761 et seq.), as well as the BLM's Solar Energy Development Policy of April 4, 2007, updated October 7, 2010. FLPMA authorizes the BLM to issue ROW grants for renewable energy projects. The President's Climate Action Plan, released on June 25, 2013, ensures America's continued leadership in clean energy. The Climate Action Plan set a new goal for the Department of the Interior to approve 20,000 MW of renewable energy projects on the public lands by 2020.

San Bernardino County has discretionary authority to issue a groundwater well permit for the proposed groundwater well(s) that would be developed for the Project. The County also has authority to grant or approve easements, rights-of-way, and/or encroachment permits where County facilities are concerned.

4.1.1 Department of Defense

The BLM coordinates with Department of Defense prior to approval of ROWs for renewable energy, utility, and communication facilities to ensure that these facilities would not interfere with military activities. Fort Irwin is located approximately 20 miles northwest of the Project site, and the Twentynine Palms Marine Corps Air Ground Combat Center is located approximately 30 miles southwest of the Project site. The Department of Defense reviewed Project development documents provided by the Applicant and determined that the Project would not interfere with military activities, including testing or training (Parisi, 2011 as cited in Caithness Soda Mountain, LLC, 2011).

4.1.2 U.S. Army Corps of Engineers

The USACE has jurisdiction to protect the aquatic ecosystem, including water quality and wetland resources under Clean Water Act Section 404. Under that authority, USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, by reviewing proposed projects to determine whether they may impact such resources and, thereby, are subject to the Section 404 permit requirement. The USACE issued a determination on August 21, 2013, that there are no waters of the United States on the Project site (USACE, 2013).

4.1.3 California Department of Fish and Wildlife

CDFW protects fish and aquatic habitats within the state through regulation of modifications to streambeds under Fish and Game Code Section 1602. The Lead Agencies and the Applicant have provided information to CDFW to assist that agency in its determination of the impacts to streambeds and the identification of permit and mitigation requirements. The Applicant is consulting with the CDFW to assess the potential need for a Streambed Alteration Agreement for impacts to any state jurisdictional waters. Compliance with the requirements of the SAA would be required to implement the Project.

CDFW also has the authority to regulate potential impacts to species that are protected under the CESA (Fish and Game Code §2050 et seq.). If appropriate, the Applicant may file an Incidental Take Permit application with CDFW and would comply with the requirements of any Incidental Take Permit issued under the CESA.

4.1.4 California Department of Transportation

Caltrans has jurisdiction over encroachments to Caltrans facilities and related easements and ROWs. The Project collection lines originating from the East and South arrays would need to cross the Caltrans ROW for I-15 in order to connect to the Project substation. The Applicant will be responsible for obtaining permission for this crossing and for complying with all relevant Caltrans requirements.

4.2 Consultation Processes for ESA Section 7, NHPA Section 106, and Indian Tribes

4.2.1 U.S. Fish and Wildlife Service

As described in Section 3.4.3.1, the USFWS has jurisdiction over threatened and endangered species listed under FESA (16 USC §1531 et seq.). In general terms, formal consultation with the USFWS under FESA Section 7 is required for any federal action that may adversely affect a federally listed species. 50 CFR 402.14. Consultation will be initiated through the preparation and submittal of a Biological Assessment (BA) that describes the Proposed Action to the USFWS. See generally 50 CFR 402.12. Following review of the BA, the USFWS would be expected to issue a Biological Opinion (BO) that addresses whether or not the Project is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.

4.2.2 NHPA Section 106 Compliance and Tribal Consultation

4.2.2.1 NHPA Section 106 Compliance

Federal agencies must demonstrate compliance with the NHPA (16 U.S.C. 470 et seq.). NHPA Section 106 requires a federal agency with jurisdiction over a project to take into account the effect of the proposed project on historic properties included on, or eligible for inclusion on, the

NRHP (16 USC 470(f)). Federal agencies also must provide the ACHP an opportunity to comment on the undertaking. Under NHPA Section 106, the BLM consults with Indian tribes as part of its responsibilities to identify, evaluate, and resolve adverse effects to historic properties affected by BLM undertakings.

Implementation of the Proposed Action also requires local and state agencies to demonstrate compliance with CEQA, for which specific guidance regarding cultural resources is presented in Appendix K of the CEQA Guidelines. Local agencies may use the NHPA process to demonstrate compliance with those CEQA requirements. Analysis of impacts in this document and implementation of the mitigation measures in Section 3.6 would provide evidence of BLM's compliance with Section 106 of the NHPA and NEPA as well as the County's compliance with CEQA with respect to cultural resources. The basic steps in the Section 106 process are described in Section 3.6, *Cultural Resources*.

4.2.2.2 Tribal Consultation

The BLM has formally invited the following eight federally recognized tribes to consult on a government-to-government basis for the Project, as provided in the Executive Memorandum of April 29, 1994, Executive Order 13175 (65 FR 67249, November 6, 2000), and Sections 101 and 106 of the NHPA: Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Las Vegas Tribe of Paiute Indians, Moapa Band of Paiute Indians, San Manuel Band of Mission Indians, Timbisha Shoshone Tribe, and the Twenty-Nine Palms Band of Mission Indians. All of the federally recognized tribes were invited to be consulting parties as provided in 36 CFR Part 800, the implementing regulations for Section 106 of the NHPA.

Consistent with policy, the BLM notified and formally requested consultation with Indian tribes at the earliest stages of the Project planning and review by letter on August 17, 2011, and has formally reiterated requests to consult in all subsequent correspondence. The BLM formally notified Indian tribes of its intent to develop a Memorandum of Agreement (MOA) for the Project, and invited the tribes to participate by letter on April 2, 2012. The BLM Field Manager and staff have actively responded to all requests to meet with tribal leaders and staff throughout project review and have met at BLM and tribal offices. A summary of the major consultation milestones includes:

1. August 17, 2011: the BLM notified and formally requested consultation with Indian tribes at the earliest stages of Project planning and review; and

2. January 23, 2013: Tribes attended a meeting and visit to the Project site. Tribes were also provided copies of the Ethnographic Study.

At a meeting with the BLM and Applicant, the tribes inquired about having tribal participants accompany cultural monitors during construction. Currently, a Cultural Resources Discovery and Monitoring Plan is being drafted as described in Mitigation Measure 3.6-2 to address the potential for inadvertent discovery, and will be submitted to the tribes for comment. To date, no other issues have been identified.

Copies of this Draft PA/EIS/EIR will be provided to the tribes for review and comment during the 90-day public comment period described below in Section 4.4.2.

4.3 Implementation, Monitoring, and Enforcement

4.3.1 Implementation

The Lead Agencies will continue to involve and collaborate with the public during the implementation of the Proposed Action if it is approved. Opportunities to become involved during implementation and monitoring could include development of partnerships and community-based citizen working groups. Citizens and user groups within the vicinity of the Project are invited to become actively involved in implementation, monitoring, and enforcement of decisions. The Lead Agencies and citizens could collaboratively develop site-specific goals and objectives that mutually benefit public land resources, local communities, and the people who live, work, or play on the public lands.

4.3.2 Monitoring

The BLM would monitor activities throughout the life of the Proposed Action to ensure that decisions are implemented in accordance with the approved ROD and ROW grant. Similarly, the County would have an obligation under the CEQA to monitor the implementation of adopted mitigation measures with respect to the groundwater well permit if approved. Monitoring would be conducted to determine whether decisions, BMPs, and approved mitigation measures are achieving the desired effects. Effectiveness monitoring would provide an empirical data base on impacts of decisions and effectiveness of mitigation. Effectiveness monitoring also would be useful for improving analytical procedures for future impact analyses and for designing or improving mitigation and enhancement measures.

4.3.3 Enforcement and Adaptive Management

Adaptive management has been incorporated into the mitigation measures adopted for the Proposed Action. Adaptive management is based on clearly identified outcomes and monitoring to determine if management actions are meeting identified outcomes. If outcomes are not being met, adaptive management facilitates management changes to ensure that outcomes are met or to re-evaluate the outcomes. Procedures include:

1. Determining environmental effects of a project and identifying mitigation needs along with other permitting and regulatory requirements. Analysis should indicate where data are lacking and uncertainty exists with respect to the intended outcomes and the significance of this lack (see 40 CFR 1502.22);

2. Monitoring designed for adaptive management must be able to result in appropriate adjustments in project activities as the project is constructed and planned mitigation is installed;

3. Striving to ensure public input into and understanding of the principles of adaptive management;

4. Maintaining open channels of information to the public and affected regulatory and permitting agencies during the application of adaptive management, including transparency of the monitoring process that precedes adaptive management and the decision-making process that implements it. This involves: (a) identifying indicators of change, (b) assessing monitoring activities for accuracy and usefulness, and (c) making changes in tactics, activities and/or strategies; and

5. Providing post-activity opportunity for public and affected outside agency review of adaptive management practices, including practices that were exceptions to any resource management plans or that had permitting and other regulatory requirements not satisfied by prior coordination.

Adaptive management allows agencies, in their environmental reviews, to establish and analyze mitigation measures that are projected to result in the desired environmental outcomes, and identify those mitigation principles or measures that it would apply in the event the initial mitigation commitments are not implemented or effective.

4.4 Public Involvement

4.4.1 Scoping

A Notice of Intent to prepare this joint PA/EIS/EIR was published in the *Federal Register* (Volume 77, No. 205) on October 23, 2012, and the California State Clearinghouse issued a Notice of Preparation on October 26, 2012. The BLM and the County jointly held publicly noticed scoping meetings on November 14, 2012, at the Hampton Inn in Barstow, California. The Final Scoping Report is included as Appendix B of this Draft PA/EIS/EIR.

The BLM also established a website that describes the Project, the process, and various methods for providing public input, including the phone number where the BLM's Project Manager may be reached, locations where Project documents may be obtained and reviewed, and an e-mail address where comments may be sent electronically: http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html.

4.4.2 Public Comment Process

This Draft PA/EIS/EIR will be circulated for a 90-day public comment period. All comments must be postmarked no later than 90 days from the date the Notice of Availability for this Draft PA/EIS/EIR is published in the Federal Register by the USEPA.

To receive comments on this jointly prepared Draft PA/EIS/EIR, the BLM is serving as the single point of contact. Accordingly, written comments may be submitted in any of the following ways:

U.S. Post Soda Mountain Solar Project
22835 Calle San Juan De Los Lagos
Moreno Valley, CA, 92553

E-mail: sodamtnsolar@blm.gov

One or more public meetings, to be noticed separately, will be held during the 90-day public comment period. Please see BLM's web page for information about the location, date, and time of any such meeting, at: http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html.

The BLM Desert District Office may also be reached for questions and information by phone at (951) 697-5387. All substantive issues raised during the comment period will be considered, and written comments addressed as appropriate in the Proposed PA/Final EIS/EIR.

Additional hard copies or CD-ROM versions of the Draft PA/EIS/EIR may be obtained by contacting the Barstow Field Office. The document also will be available on the Internet at: http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html.

4.5 Administrative Remedies

BLM and USEPA's Office of Federal Activities will publish separate Notices of Availability (NOAs) for the Proposed PA/Final EIS/EIR in the Federal Register when the document is ready to be released to the public. The NOA to be published by the USEPA in the Federal Register will initiate a 30-day protest period on the Proposed PA to the Director of the BLM in accordance with 43 CFR Section 1610.5-2.

Following resolution of any protests, BLM will publish a Record of Decision which may be accompanied by an Approved Plan Amendment.

The County will publish an NOA in a newspaper of general circulation in the Project area announcing its intention to consider the Proposed PA/Final EIS/EIR for approval. The County Department of Public Health will decide whether to approve the Groundwater Well Permit.

4.6 List of Preparers

Though individuals have primary responsibility for preparing sections of this PA/EIS/EIR, the document is an interdisciplinary team effort. In addition, internal review of the document occurs throughout preparation. Specialists at the BLM's Field Office, State Office, and Washington Office and throughout the County government review the analysis and supply information, as well as provide document preparation oversight. Contributions by individual preparers may be subject to revision by other BLM and County specialists and by management during internal review.

TABLE 4-1
LIST OF PREPARERS

Name	Position/Qualifications	Primary Responsibility
BLM – Barstow Field Office		
Chavez, R. Anthony	Rangeland Management Specialist	Vegetation Resources
Shearer, James	Archaeologist	Cultural Resources
BLM – California Desert District Office		
Childers, Jeff	Planning and Environmental Coordinator	Land Use Planning and NEPA Compliance
Elser, Lynnette	Planning and Environmental Coordinator	Land Use Planning and NEPA Compliance
Godfrey, Peter	Hydrologist	Water Resources
LaPre, Larry	Wildlife Biologist	Wildlife and Vegetation Resources
Ludwig, Noel	Hydrologist	Water Resources
Najar, Jose	Realty Specialist	Land Use Planning and NEPA Compliance
BLM – California State Office		
Anderson, Brandon	Realty Specialist	Lands and Realty
Lund, Christina	State Botanist	Botany
Meyer-Shields, Elizabeth	Planning and Environmental Coordinator	Planning, NEPA Compliance
Wick, Bob	Natural Resource Specialist - Wilderness	Wilderness Characteristics Inventory/VRM
BLM – Other Offices		
Allen, Stewart	Socioeconomic Specialist	Socioeconomics and Environmental Justice
Nelson, Britta	Management and Program Analyst, National Conservation Lands	Trails, Recreation, Special Designations
Novosak, Brian	Wildlife Biologist, Fish, Wildlife and Plant Conservation Division	Wildlife Resources
Salt, Deborah	National Scenic & Historic Trails Coordinator	Trails, Recreation, Special Designations
Whyte, Jennifer	Realty Specialist	Lands and Realty
San Bernardino County		
Conner, Christopher	Senior Planner, Project Manager	Land Use Planning and CEQA Compliance
Reeder, Wes	County Geologist	Water Resources
Environmental Science Associates and Consultant Team		
Aron, Geraldine	Paleontologist (Paleo Solutions, Inc.)	Paleontological Resources
Barringhaus, Cory	Senior Associate; M.U.P. Urban Planning	Utilities and Public Services, Hazards and Hazardous Materials
Bray, Madeleine	RPA, M.A., Archaeology	Cultural Resources
Burns, Michael	Program Manager; Certified Engineering Geologist, Professional Geologist	Geology and Soils, Mineral Resources, Water Resources
Carlson, Allisa	Senior Associate; Professional Landscape Architect, LEED AP	Visual Resources
Cordery, Ted	Biologist, B.S., Wildlife Management (TEC-Ecological, LLC)	Vegetation and Wildlife Resources, Wildland and Fire Ecology
Costa, Peter	Transportation Specialist; M.S., Urban Planning and Public Policy	Transportation and Traffic

TABLE 4-1 (Continued)
LIST OF PREPARERS

Name	Position/Qualifications	Primary Responsibility
Environmental Science Associates and Consultant Team (cont.)		
Fagundes, Matt	Physical Sciences Resource Area Leader; B.S., Environmental Studies	Air Quality, Noise, Greenhouse Gas Emissions and Global Climate Change
Gispert, Cristina	Senior Associate; B.S. Environmental Management and Protection	Scoping Report, Land Use and Planning
Gragg, Justin	Technical Associate; M.S. Environmental Science and Management	Mineral Resources, Geology and Soils
Hudson, Peter	Senior Geologist/Hydrogeologist, PD, CEG	Hydrology and Water Quality
Hutchison, Jack	Senior Transportation Engineer, P.E.	Transportation and Travel Management
Kershaw, Byard	Geology and Hazards Specialist (North Rim Consulting, LLC)	Hazards and Hazardous Materials, Mineral Resources, Geology and Soils
Kershaw, Carol	Lands and Realty Specialist (Red Rock Consulting, LLC)	Lands and Realty
Kostalas, Alexandra	Senior Associate; M.A., Urban Planning	Proposed Action and Alternatives, Environmental Justice, Social and Economics, Quality Assurance/Quality Control all sections
Lancelle, Karen	Associate; B.A., Geology	Administrative Record, Mineral Resources, Geology and Soils
Lindley, Mark	Senior Engineer; P.E.	Hydrology
Manka, Michael	Manager; B.S., Biological Sciences	Quality Assurance/Quality Control all sections
Moore, Julie	Health and Safety Specialist; M.S., Ecology	Hazards and Hazardous Materials
O'Sullivan, Terry	Natural Resources Specialist, B.S., Natural Resources Management (O'Sullivan Resources, LLC)	Recreation, Special Designations
Pittman, Brian	Senior Technical Associate; Certified Wildlife Biologist	Biological Resources, Wildland Fire Ecology
Scott, Janna	Managing Associate, J.D.	Cumulative Projects, Quality Assurance/Quality Control all sections
Stewart, Shannon	Principle Technical Associate; M.S., Planning	Quality Assurance/Quality Control all sections
Strauss, Monica	RPA, Director, Senior Managing Archaeologist, M.A., Archaeology	Cultural Resources
Taplin, Justin	Technical Associate; M.S., Environmental Management	Water Resources
Tierney, Kristina	Senior Associate; M.S., Environmental Science and Management	Air Quality, Noise, Greenhouse Gas Emissions and Global Climate Change
Watson, Julie	Senior Managing Associate; M.S., Landscape Ecology	Quality Assurance/Quality Control all sections

References

Caithness Soda Mountain, LLC, 2011. Plan of Development, Soda Mountain Solar Project. The following reference from this document was used as a secondary reference in this PA/EIS/EIR:

Parisi, Anthony, 2011. Personal communication between Anthony Parisi, Head, Sustainability Office NAVAIR Ranges, and Stefanie Smith, RMT.

National Interagency Fire Center (NIFC), 2012. Interagency Standards for Fire and Fire Aviation Operations 2012. January. [http://www.nifc.gov/PUBLICATIONS/redbook/2012/2012RedBookALL.pdf]

U.S. Army Corps of Engineers, 2013. Approved Jurisdictional Determination regarding presence/absence of geographic jurisdiction. August 21.

This page intentionally left blank

CHAPTER 5
Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per Liter
$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AB 32	California Global Warming Solutions Act of 2006
AB	Authorized Biologist
AC	alternating current
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
AADT	Annual Average Daily Traffic
AF	acre-foot
AFY	acre-feet per year
AIRFA	American Indian Religious Freedom Act
AM	Amplitude Modulated
amsl	above mean sea level
AO	Authorized Officer
APE	Area of Potential Effects
APLIC	Avian Power Line Interaction Committee
APM	Applicant Proposed Measure
APN	Assessor's Parcel Number
ARPA	Archaeological Resources Protection Act of 1979
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing Materials Standards
ATCM	Airborne Toxic Control Measure
ATV	all-terrain vehicle
BA	Biological Assessment
BCC	Birds of Conservation Concern
BEA	United States Bureau of Economic Analysis
BGEPA	Bald and Golden Eagle Protection Act

bgs	below ground surface
BLM	United States Department of Interior, Bureau of Land Management
BM	Biological Monitor
BMPs	best management practices
BO	Biological Opinion
BOE	California State Board of Equalization
BRMIMP	Biological Resources Mitigation, Implementation, and Monitoring Plan
BRMMP	Biological Resources Mitigation and Monitoring Plan
BRTR	Biological Resources Technical Report
CAA	Clean Air Act
CAISO	California Independent System Operator
CAL FIRE	California Department of Forestry and Fire Protection
CalArp	California Accidental Release Program
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Cal-IPC	California Invasive Plant Council
Cal-OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCD	Census County Division
CCH	Consortium of California Herbaria
CCR	California Code of Regulations
CDCA	California Desert Conservation Area
CDCA Plan	California Desert Conservation Area Plan of 1980, as amended
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game (prior to 2013)
CDFW	California Department of Fish and Wildlife (formerly CDFG)
CDMG	California Division of Mines and Geology
CDOC	California Department of Conservation
CDPA	California Desert Protection Act of 1994
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second

CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CMA	Congestion Management Agency
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CPM	Compliance Project Manager
CRHR	California Register of Historical Resources
CSC	California Species of Special Concern
CSRL	California Soil Resource Lab
CT	census tract
CUPA	Certified Unified Program Authority
CWA	Clean Water Act
cy	cubic yards
dB	decibel
dBA	A-weighted decibel
DC	direct current
DOD	United States Department of Defense
DOE	United States Department of Energy
DOI	United States Department of Interior
DPM	diesel particulate matter
DRECP	California Desert Renewable Energy Conservation Plan
DTSC	Department of Toxic Substances Control
DWMA	Desert Wildlife Management Area
DWR	California Department of Water Resources
EAP	Emergency Action Plan
ECCMP	Environmental and Construction Compliance Monitoring Plan
ECM	Environmental Compliance Manager
EDD	California Employment Development Department
EIC	Eastern Information Center
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Field

EPAct	Energy Policy Act of 2005
EPCRA	Emergency Planning and Community Right-To-Know Act of 1986
EPRI	Electric Power Research Institute
EPS	Emission Performance Standard
ESA	Environmental Site Assessment or Environmental Science Associates
FAA	Federal Aviation Administration
FE	Federally listed as endangered
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FHSZ	Fire Hazard Severity Zone
FIRM	Flood Insurance Rate Map
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FPEIS	Final Programmatic Environmental Impact Statement
FR	Federal Register
FRA	Federal Railroad Administration
ft	foot
FT	Federally listed as threatened
FTA	Federal Transit Administration
FTE	full-time equivalent
FY	fiscal year
g	gravity
gal	gallon
GCL	geosynthetic clay liner
GDP	gross domestic product
GHG	greenhouse gas
GIS	geographic information system
gpd	gallons per day
gpd/ft	gallons per day per foot
gpd/ft^2	gallons per day per square foot
gpm	gallons per minute
GPS	global positioning system
GWP	global warming potential
H_2S	hydrogen sulfide
HCP	habitat conservation plan

HDPE	high-density polyethylene
HFCs	hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
hp	horsepower
HPTP	Historic Properties Treatment Plan
HWCL	Hazardous Waste Control Law
Hz	Hertz
I-15	Interstate 15
IBC	International Building Code
IEEE	Institute of Electrical and Electronics Engineers
IIPP	Injury and Illness Prevention Program
IM	Instructional Memorandum
IPCC	International Panel on Climate Change
IWMP	Integrated Weed Management Plan
kg	kilogram
KOP	key observation point
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
L_{90}	The A-weighted noise level that is exceeded 90 percent of the time during the measurement period.
LADWP	Los Angeles Department of Water and Power
lbs	pounds
LCD	liquid crystal display
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
LLC	Limited Liability Corporation
LOS	level of service
LRA	Local Responsibility Area
LRWQCB	Lahontan Regional Water Quality Control Board
LUP	Land Use Plan
m	meter
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
mg/L	milligrams per liter

mg/m^3	milligrams per cubic meter
mi	mile
ml	milliliter
mm	millimeter
MM	Modified Mercalli
MMRCP	Mitigation Monitoring, Reporting, and Compliance Program
mph	miles per hour
MRDS	Mineral Resources Data System
MRZ	Mineral Resource Zone
MSA	Metropolitan Statistical Area
MW	megawatt
MWh	megawatt-hour
N_2O	nitrous oxide
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NIFC	National Interagency Fire Center
NLCS	National Landscape Conservation System
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NOP	Notice of intent to prepare an EIR
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NPS	United States National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NREL	National Renewable Energy Laboratory
NSPS	New Source Performance Standard
NSR	New Source Review
NTP	Notice to Proceed
NWCG	National Wildfire Coordinating Group

NWIS	National Water Information System
O_2	oxygen
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OHV	off-highway vehicle
OPR	California Governor's Office of Planning and Research
OSHA	United States Occupational Safety and Health Administration
PA	Plan Amendment
PAR	Property Analysis Record or Pesticide Application Report
PCS	power conversion station
PEIS	Programmatic Environmental Impact Statement
PER	Programmatic Environmental Report
PFCs	perfluorocarbons
PFYC	Potential Fossil Yield Classification
PGA	peak ground acceleration
PL	Public Law
PM	particulate matter
PM10	particulate matter less than 10 microns in diameter
PM2.5	particulate matter less than 2.5 microns in diameter
POD	Plan of Development
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
ppm	parts per million
PRPA	Paleontologic Resources Preservation Act
PSD	Prevention of Significant Deterioration
PUP	Pesticide Use Proposal
PV	photovoltaic
R	State characterized as rare
RCRA	Resource Conservation and Recovery Act of 1976
REAT	Renewable Energy Action Team
ROD	Record of Decision
ROG	reactive organic gas
ROW	right-of-way
RPS	Renewables Portfolio Standard
RQ	reportable quantity
RV	recreational vehicle
RWQCB	Regional Water Quality Control Board

SARA	Superfund Amendments and Reauthorization Act of 1986
SCADA	supervisory control and data acquisition
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SDWA	Safe Drinking Water Act
SE	State listed as endangered
SEZ	Solar Energy Zone
SF	Standard form
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLRU	Sensitivity Level Rating Units
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SO_4	sulfate
SOPs	standard operating procedures
SO_X	sulfur oxides
SPCC	Spill Prevention Control and Countermeasures
SQRU	Scenic Quality Rating Units
SRA	State Responsibility Area
ST	State listed as threatened
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCR	The Climate Registry
TDS	Total Dissolved Solids
TSCA	Toxic Substances Control Act of 1976
TQ	threshold quantity
UL	Underwriters Laboratory
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	Unite States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

UST	underground storage tank
UXO	unexploded ordnance
UV	ultraviolet
V	volts
VdB	velocity decibel
VFPO	Victorville Fire Protection Office
VMT	vehicle miles traveled
VOC	volatile organic compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
VRMP	Vegetation Resources Management Plan
W	watts
WDR	Waste Discharge Requirement
WHMA	Wildlife Habitat Management Area
WIU	Wilderness Inventory Unit
WL	Watch List
W/m^2	watts per square meter
WNV	West Nile Virus
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area or Water Supply Assessment
yr	year

CHAPTER 6
Glossary

A

Air Basin: A regional area defined for state air quality management purposes based on considerations that include topographic features that influence meteorology and pollutant transport patterns, and political jurisdiction boundaries that influence the design and implementation of air quality management programs.

Air Quality Control Region: A regional area defined for federal air quality management purposes based on considerations that include topographic features that influence meteorology and pollutant transport patterns, and political jurisdiction boundaries that influence the design and implementation of air quality management programs.

Alluvium: A fine-grained fertile soil consisting of mud, silt, and sand deposited by flowing water on flood plains, in river beds, and in estuaries.

Alluvial Fan: A fan-shaped material of water-deposited material.

Ambient Air Quality Standards (AAQS): A combination of air pollutant concentrations, exposure durations, and exposure frequencies that are established as thresholds above which adverse impacts to public health and welfare may be expected. Ambient air quality standards are set on a national level by the U.S. Environmental Protection Agency. Ambient air quality standards are set on a state level by public health or environmental protection agencies as authorized by state law.

Ambient Air: Outdoor air in locations accessible to the general public.

Area of Critical Environmental Concern (ACEC): A special management area designated by BLM to protect significant historic, cultural, or scenic values; fish and wildlife resources; natural process or systems; and/or natural hazards; that:

a. has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource;

b. has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change;

c. has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of Federal Land Management and Practices Act (FLMPA);

d. has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare; and/or

e. poses a significant threat to human life and safety or to property.

Area of Potential Effects (APE): The geographic area or areas within which an action may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

Attainment Area: An area that has air quality as good as or better than a national or state ambient air quality standard. A single geographic area may be an attainment area for one pollutant and a non-attainment area for others.

B

Best Management Practices (BMPs): A practice or combination of practices that are determined to provide the most effective, environmentally sound, and economically feasible means of managing an activity and mitigating its impacts.

C

Cancer: A class of diseases characterized by uncontrolled growth of somatic cells. Cancers are typically caused by one of three mechanisms: chemically induced mutations or other changes to cellular DNA; radiation induced damage to cellular chromosomes; or viral infections that introduce new DNA into cells.

Carbon Monoxide (CO): A colorless, odorless gas that is toxic because it reduces the oxygen-carrying capacity of the blood.

Characteristic: A distinguishing trait, feature, or quality.

Characteristic Landscape: The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to an agricultural setting, an urban landscape, a primarily natural environment, or a combination of these types.

Climate: A statistical description of daily, seasonal, or annual weather conditions based on recent or long-term weather data. Climate descriptions typically emphasize average, maximum, and minimum conditions for temperature, precipitation, humidity, wind, cloud cover, and sunlight intensity patterns; statistics on the frequency and intensity of tornado, hurricane, or other severe storm events may also be included.

Community Noise Equivalent Level (CNEL): A 24-hour average noise level rating with a 5 dB penalty factor applied to evening noise levels and a 10 dB penalty factor applied to nighttime noise levels. The CNEL value is very similar to the Day-Night Average Sound Level (Ldn) value, but includes an additional weighting factor for noise during evening hours.

Contrast: Opposition or unlikeness of different forms, lines, colors, or textures in a landscape.

Contrast Rating: A method of analyzing the potential visual impacts of proposed management activities.

Corrosive Soils: Potential soil-induced electrochemical or chemical action that could corrode or deteriorate concrete, reinforcing steel in concrete structures, and bare-metal structures.

Cretaceous: In geologic history the third and final period of the Mesozoic era, from 144 million to 65 million years ago, during which extensive marine chalk beds formed.

Criteria Pollutant: An air pollutant for which there is a national ambient air quality standard (carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, inhalable particulate matter, fine particulate matter, or airborne lead particles).

Critical Habitat: Habitat designated by the U.S. Fish and Wildlife Service under Section 4 of the federal Endangered Species Act and under the following criteria: 1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features essential to the conservation of the species and that may require special management of protection; or 2) specific areas outside the geographical area by the species at the time it is listed but that are considered essential to the conservation of the species.

Cryptobiotic Soils: A type of biological soil crust that occurs in hot desert areas, such as the Mojave and Sonoran deserts, comprised of a complex mosaic of cyanobacteria, lichens, mosses, or other bacteria. Cyanobacterial filaments weave through the top few millimeters of soil, gluing loose particles together and forming a matrix that stabilizes and protects soil surfaces from erosive forces (BLM, 2001).

Cultural Modification: Any man-caused change in the land form, water form, vegetation, or the addition of a structure which creates a visual contrast in the basic elements (form, line, color, texture) of the naturalistic character of a landscape.

Cultural Resource: A location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include archaeological and historical sites, structures, buildings, objects, artifacts, works of art, architecture, and natural features that were important in past human events. They may consist of physical remains or areas where significant human events occurred, even though evidence of the events no longer remains. And they may include definite locations of traditional, cultural, or religious importance to specified social or cultural groups.

Cultural Resource Integrity: The condition of a cultural property, its capacity to yield scientific data, and its ability to convey its historical significance. Integrity may reflect the authenticity of a property's historic identity, evidenced by the survival or physical characteristics that existed during its historic or prehistoric period, or its expression of the aesthetic or historic sense of a particular period of time.

Cultural Resource Survey: A descriptive listing and documentation, including photographs and maps of cultural resources. Included in an inventory are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and on-the-ground surveys of varying intensity.

Class I: A professionally prepared study that compiles, analyzes, and synthesizes all available data on an area's cultural resources. Information sources for this study include published and unpublished documents, BLM inventory records, institutional site files, and state and National Register files. Class I inventories may have prehistoric, historic, and ethnological and sociological elements. These inventories are periodically updated to include new data from other studies and Class II and III inventories.

Class II: A professionally conducted, statistically based sample survey designed to describe the probable density, diversity, and distribution of cultural properties in a large area. This survey is achieved by projecting the results of an intensive survey carried out over limited parts of the target area. Within individual sample units, survey aims, methods, and intensities are the same as those applied in Class III inventories. To improve statistical reliability, Class II inventories may be conducted in several phases with different sample designs.

Class III: A professionally conducted intensive survey of an entire target area aimed at locating and recording all visible cultural properties. In a Class III survey, trained observers commonly conduct systematic inspections by walking a series of close interval parallel transects until they have thoroughly examined an area.

D

Day/Night Average Sound Level (Ldn): A 24-hour average noise level rating with a 10 dB penalty factor applied to nighttime noise levels. The Ldn value is very similar to the CNEL value, but the CNEL value does not include any weighting factor for noise during evening hours.

Decibel (dB): A generic term for measurement units based on the logarithm of the ratio between a measured value and a reference value. Decibel scales are most commonly associated with acoustics (using air pressure fluctuation data); but decibel scales sometimes are used for ground-borne vibrations or various electronic signal measurements.

Desert Pavement: A surface covering of closely packed rock fragments of pebble or cobble size found on desert soils.

Distance Zones: A subdivision of the landscape as viewed from an observer position. The subdivision (zones) includes foreground-middle ground, background, and seldom seen.

E

Enhancement: A management action designed to improve visual quality.

Equivalent Average Sound Pressure Level (Leq): The decibel level of a constant noise source that would have the same total acoustical energy over the same time interval as the actual time-varying noise condition being measured or estimated. Leq values must be associated with an explicit or implicit averaging time in order to have practical meaning.

Erosion: A natural process whereby soil and highly weathered rock materials are worn away and transported to another area, most commonly by wind or water.

Ethnographic Resources: Resources representing the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape features, cemeteries, shrines, or ethnic neighborhoods and structures.

Excavation: The scientific examination of an archaeological site through layer-by-layer removal and study of the contents within prescribed surface units, e.g. square meters.

Expansive Soils: A soil which significantly changes its volume in horizontal and vertical planes with changes in moisture content.

F

Fault (active): A fault that has had surface displacement during Holocene time (last 11,000 years).

Fault (potentially active): A Quaternary-age (last 1.8 million years) fault that lacks evidence of Holocene-age displacement.

Fluvial: Of, relating to, or occurring in a river.

Form: The mass or shape of an object or objects which appear unified, such as a vegetative opening in a forest, a cliff formation, or a water tank.

G

Geomorphic Province: Naturally defined geologic regions that display a distinct landscape or landform.

Glare: The sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted, which causes annoyance, discomfort, or loss in visual performance and visibility. See Glint.

Glint: A momentary flash of light resulting from a spatially localized reflection of sunlight.

Greenhouse Gas (GHG): A gaseous compound that absorbs infrared radiation and re-radiates a portion of that back toward the earth's surface, thus trapping heat and warming the earth's atmosphere.

H

Habitat: A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Hazardous Air Pollutant (HAP): Air pollutants which have been specifically designated by relevant federal or state authorities as being hazardous to human health. Most HAP compounds are designated due to concerns related to: carcinogenic, mutagenic, or teratogenic properties; severe acute toxic effects; or ionizing radiation released during radioactive decay processes.

Hertz (Hz): A standard unit for describing acoustical frequencies measured as the number of air pressure fluctuation cycles per second. For most people, the audible range of acoustical frequencies is from 20 Hz to 20,000 Hz.

Historical Site: A location that was used or occupied after the arrival of Europeans in North America (ca. A.D. 1492). Such sites may consist of physical remains at archaeological sites or areas where significant human events occurred, even though evidence of the events no longer remains. They may have been used by people of either European or Native American descent.

Holocene: Of, denoting, or formed in the second and most recent epoch of the Quaternary period, which began 10,000 years ago at the end of the Pleistocene.

Hydrocarbons: Any organic compound containing only carbon and hydrogen, such as the alkanes, alkenes, alkynes, terpenes, and arenes.

Hydrocompaction: Generally is limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids.

I

Indian Tribe: Any American Indian group in the United States that the Secretary of the Interior recognizes as possessing tribal status (listed periodically in the Federal Register).

Invasive Species: An exotic species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13122, 2/3/99).

Isolate: Non-linear, isolated archaeological features without associated artifacts.

K

Key Observation Point (KOP): One or a series of points on a travel route or at a use area or a potential use area, where the view of a management activity would be most revealing.

L

Landscape Character: The arrangement of a particular landscape as formed by the variety and intensity of the landscape features and the four basic elements of form, line, color, and texture. These factors give the area a distinctive quality which distinguishes it from its immediate surroundings.

Landscape Features: The land and water form, vegetation, and structures which compose the characteristic landscape.

Landslide: A slope failure that involves downslope displacement and movement of material either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces.

Leasable Minerals: Minerals whose extraction from federally managed land requires a lease and the payment of royalties. Leasable minerals include coal, oil and gas, oil shale and tar sands, potash, phosphate, sodium, and geothermal steam.

Line: The path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture. Within landscapes, lines may be found as ridges, skylines, structures, changes in vegetative types, or individual trees and branches.

Liquefaction: A condition in which a saturated cohesionless soil may lose shear strength because of a sudden increase in pore water pressure caused by an earthquake.

Locatable Minerals: Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

M

Maintenance Area: An area that currently meets federal ambient air quality standards but which was previously designated as a nonattainment area. Federal agency actions occurring in a maintenance area are still subject to Clean Air Act conformity review requirements.

Memorandum of Understanding (MOU): A written but noncontractual agreement between two or more agencies or other parties to take a certain course of action.

Metropolitan Statistical Areas (MSAs): A geographical region with a relatively high population density at its core and close economic ties throughout the area, delineated for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics.

Mineral Material Disposal: The sale of sand, gravel, decorative rock, or other materials defined in 43 CFR 3600.

Mining Claim: A mining claim is a selected parcel of Federal Land, valuable for a specific mineral deposit or deposits, for which a right of possession has been asserted under the General Mining Law. This right is restricted to the development and extraction of a mineral deposit. The rights granted by a mining claim protect against a challenge by the United States and other claimants only after the discovery of a valuable mineral deposit. The two types of mining claims are lode and placer. In addition, mill sites and tunnel sites may be located to provide support facilities for lode and placer mining.

Mitigation: Mitigation includes: (a) Avoiding the impacts altogether by not taking an action or parts of an action, (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, (e) Compensating for the impact by replacing or providing substitute resources or environments (40 CFR §1508.20).

N

National Pollutant Discharge Elimination System (NPDES): The NPDES permit program has been delegated in California to the State Water Resources Control Board. These sections of the CWA require that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a state certification that the discharge complies with other provisions of the Clean Water Act.

National Register of Historic Places: The official list, established by the National Historic Preservation Act, of the Nation's cultural resources worthy of preservation. The National Register lists archeological, historic, and architectural properties (i.e. districts, sites, buildings, structures, and objects) nominated for their local, state, or national significance by state and federal agencies and approved by the National Register Staff. The National Park Service maintains the National Register.

Native American: Indigenous peoples of the western hemisphere.

Nitric Oxide (NO): A colorless toxic gas formed primarily by combustion processes that oxidize atmospheric nitrogen gas or nitrogen compounds found in the fuel. Nitric oxide is a precursor of ozone, nitrogen dioxide, numerous types of photochemically generated nitrate particles (including PAN), and atmospheric nitrous and nitric acids. Most nitric oxide formed by combustion processes is converted into nitrogen dioxide by subsequent oxidation in the atmosphere over a period that may range from several hours to a few days.

Nitrogen Dioxide (NO_2): A toxic reddish gas formed by oxidation of nitric oxide. Nitrogen dioxide is a strong respiratory and eye irritant. Most nitric oxide formed by combustion processes is converted into nitrogen dioxide by subsequent oxidation in the atmosphere. Nitrogen dioxide is a criteria pollutant in its own right, and is a precursor of ozone, numerous types of photochemically generated nitrate particles (including PAN), and atmospheric nitrous and nitric acids.

Nitrogen Oxides (NO_x): A group term meaning the combination of nitric oxide and nitrogen dioxide; other trace oxides of nitrogen may also be included in instrument-based NOx measurements. Nitrogen oxides are a precursor of ozone, photochemically generated nitrate particles (including PAN), and atmospheric nitrous and nitric acids.

Non-native Species: A plant species that has been introduced, either intentionally or not, to a new geographical area. Non-native species can be, but are not necessarily invasive. See also Invasive Species.

Noxious Weed: According to the Federal Noxious Weed Act (PL 93-629), a weed that causes disease or has other adverse effects on man or his environment and therefore is detrimental to the agricultural and commerce of the United States and to the public health.

Nonattainment Area: An area that does not meet a federal or state ambient air quality standard. Federal agency actions occurring in a federal nonattainment area are subject to Clean Air Act conformity review requirements.

O

Off-Highway Vehicle (OHV): A vehicle operated exclusively off public roads and highways on lands that are open and accessible to the public, and includes racing motorcycles, trail bikes, mini bikes, dune buggies, all-terrain vehicles, jeeps, and snowmobiles.

Organic Compounds: Compounds of carbon containing hydrogen and possibly other elements (such as oxygen, sulfur, or nitrogen). Major subgroups of organic compounds include hydrocarbons, alcohols, aldehydes, carboxylic acids, esters, ethers, and ketones. Organic compounds do not include crystalline or amorphous forms of elemental carbon (graphite, diamond, carbon black, etc.), the simple oxides of carbon (carbon monoxide and carbon dioxide), metallic carbides, or metallic carbonates.

Overdraft condition: A condition in which the total volume of water being extracted from the groundwater basin would be greater than the total recharge provided to the basin.

Ozone (O_3): A compound consisting of three oxygen atoms. Ozone is a major constituent of photochemical smog that is formed primarily through chemical reactions in the atmosphere involving reactive organic compounds, nitrogen oxides, and ultraviolet light. Ozone is a toxic chemical that damages various types of plant and animal tissues and which causes chemical oxidation damage to various materials. Ozone is a respiratory irritant, and appears to increase susceptibility to respiratory infections. A natural layer of ozone in the upper atmosphere absorbs high energy ultraviolet radiation, reducing the intensity and spectrum of ultraviolet light that reaches the earth's surface.

P

Paleontological Resources (Fossils): The physical remains of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are for understanding past environments, environmental change, and the evolution of life.

Paleontology: A science dealing with the life forms of past geological periods as known from fossil remains.

Paleozoic Era: An era of geologic time (600 million to 280 million years ago) between the Late Precambrian and the Mesozoic eras and comprising the Cambrian, Ordovician, Silurian, Devonian, Missippian, Pennsylvanian, and Permian periods.

Particulate Matter: Solid or liquid material having size, shape, and density characteristics that allow the material to remain suspended in the atmosphere for more than a few minutes. Particulate matter can be characterized by chemical characteristics, physical form, or aerodynamic properties. Categories based on aerodynamic properties are commonly described as being size categories, although physical size is not used to define the categories. Many components of suspended particulate matter are respiratory irritants. Some components (such as crystalline or fibrous minerals) are primarily physical irritants. Other components are chemical irritants (such as sulfates, nitrates, and various organic chemicals). Suspended particulate matter also can contain compounds (such as heavy metals and various organic compounds) that are systemic toxins or necrotic agents. Suspended particulate matter or compounds adsorbed on the surface of particles can also be carcinogenic or mutagenic chemicals. See PM10 and PM2.5.

Peak Ground Acceleration (PGA): A common measure of ground motion during an earthquake. The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g. hard bedrock, soft sediments, or artificial fills).

pH (parts hydrogen): a measure of the acidity or basicity of a water-based solution. Pure water is considered neutral with a pH of 7, while solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline.

Physiographic Province: An extensive portion of the landscape normally encompassing many hundreds of square miles, which portrays similar qualities of soil, rock, slope, and vegetation of the same geomorphic origin (Fenneman 1946; Sahrhaftig 1975).

Pleistocene (Ice Age): An epoch in the Quarternary period of geologic history lasting from 1.8 million to 10,000 years ago. The Pleistocene was an epoch of multiple glaciation, during which continental glaciers covered nearly one fifth of the earth's land.

Pliocene: The Pliocene Epoch is the period in the geologic timescale that extends from 5.332 million to 2.588 million years before present.

PM2.5 (fine particulate matter): A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 6 microns penetrate into the alveoli in the lungs. In a regulatory context, PM2.5 is any suspended particulate matter collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 2.0 to 2.5 microns and an maximum aerodynamic diameter collection limit less than 6 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 2.5 microns and less than 50 percent for particles with aerodynamic diameters larger than 2.5 microns.

PM10 (inhalable particulate matter): A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 50 microns penetrate to the lower respiratory tract (tracheo-bronchial airways and alveoli in the lungs). In a regulatory context, PM10 is any suspended particulate matter collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 9.5 to 10.5 microns and an maximum aerodynamic diameter collection limit less than 50 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 10 microns and less than 50 percent for particles with aerodynamic diameters larger than 10 microns.

Potential Fossil Yield Classification (PFYC) system: A system in which geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level.

Power Purchase Agreement (PPA): A contract between two parties, one who generates and intends to sell electricity, and one who is looking to purchase electricity, defining the commercial terms for the sale of electricity between the two parties.

Precursor: A compound or category of pollutant that undergoes chemical reactions in the atmosphere to produce or catalyze the production of another type of air pollutant.

Prehistoric: Refers to the period wherein American Indian cultural activities took place before written records and not yet influenced by contact with nonnative culture(s).

Q

Quaternary Age: The most recent of the three periods of the Cenozoic Era. In the geologic time scale of the International Commission on Stratigraphy, it follows the Tertiary Period, spanning time from approximately 2.6 ± 0.005 million years ago to the present. The Quaternary includes two geologic epochs: the Pleistocene and the Holocene.

R

Record of Decision: A formal decision document issued by a federal agency to document a decision made following the release of a Final Environmental Impact Statement.

Rehabilitation: A management alternative and/or practice which restores landscapes to a desired scenic quality.

Reverse Osmosis (RO) System: A water purification technology that uses a semipermeable membrane to remove many types of molecules and ions from solutions (e.g., to remove dissolved solids from groundwater).

Riparian: Situated on or pertaining to the bank of a river, stream, or other body of water. Normally describes plants of all types that grow rooted in the water table or sub-irrigation zone of streams, ponds, and springs.

Road: A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Route: “Routes” represents a group or set of roads, trails, and primitive roads that represents less than 100 percent of the BLM transportation system. Generically, components of the transportation system are described as routes.

S

Saleable Minerals: Common variety minerals on the public lands, such as sand and gravel, which are used mainly for construction. See also Mineral Material Disposal.

Scale: The proportionate size relationship between an object and the surroundings in which the object is placed.

Scenery: The aggregate of features that give character to a landscape.

Scenic Area: An area whose landscape character exhibits a high degree of variety and harmony among the basic elements which results in a pleasant landscape to view.

Scenic Quality: The relative worth of a landscape from a visual perception point of view.

Scenic Quality Ratings: The relative scenic quality (A, B, or C) assigned a landscape by applying the scenic quality evaluation key factors; scenic quality A being the highest rating, B a moderate rating, and C the lowest rating.

Scenic Values: See Scenic Quality and Scenic Quality Ratings.

Secretary of the Interior: The U.S. Department of the Interior is in charge of the nation's internal affairs. The Secretary position is the head of this agency and serves on the President's cabinet.

Sedimentary Rocks: Rocks, such as sandstone, limestone, and shale, that are formed from sediments or transported fragments deposited in water.

Sensitivity Levels: Measures (e.g., high, medium, and low) of public concern for scenic quality.

Settlement: A process by which soils decrease in volume. Earthquake induced settlement results when relatively unconsolidated granular materials experience vibration associated with seismic events. Local settlement can occur when areas containing compressible soils are subject to foundation or fill loads.

Special-Status Species: Federal- or state-listed species, candidate or proposed species for listing, or species otherwise considered sensitive or threatened by state and federal agencies.

State Historic Preservation Office (SHPO): The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the National Historic Preservation Act.

State Implementation Plan (SIP): Legally enforceable plans adopted by states and their subdivisions and submitted to EPA for approval, which identify the actions and programs to be undertaken by the State and its subdivisions to achieve and maintain national ambient air quality standards in a time frame mandated by the Clean Air Act.

State Water Resources Control Board (SWRCB): Created in 1967, joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters. The mission of the nine Regional Water Quality Control Boards is to develop and enforce water quality objectives and implementation plans that will best protect the State's waters, recognizing local differences in climate, topography, geology, and hydrology.

Stratigraphy: The order and relative position of strata (a layer of rock in the ground) and their relationship to the geological time scale.

Subsurface: Of or pertaining to rock or mineral deposits which generally are found below the ground surface.

Sulfur Dioxide (SO_2): A pungent, colorless, and toxic oxide of sulfur formed primarily by the combustion of fossil fuels. It is a respiratory irritant, especially for asthmatics. It is a criteria pollutant in its own right, and a precursor of sulfate particles and atmospheric sulfuric acid.

T

Tertiary: The Tertiary Period marks the beginning of the Cenozoic Era. It began 65 million years ago and lasted more than 63 million years, until 1.8 million years ago. The Tertiary is made up of 5 epochs: the Paleocene Epoch, the Eocene Epoch, the Oligocene Epoch, the Miocene Epoch, and the Pliocene Epoch.

Texture: The visual manifestations of the interplay of light and shadow created by the variations in the surface of an object or landscape.

Total Dissolved Solids: A measure of the combined content of all inorganic and organic substances contained in a liquid that are smaller than two micrometers in diameter (e.g., sodium).

Toxic: Poisonous; exerting an adverse physiological effect on the normal functioning of an organism's tissues or organs through chemical or biochemical mechanisms following physical contact or absorption.

Traditional Cultural Properties: Areas associated with the cultural practices or beliefs of a living community. These sites are rooted in the community's history and are important in maintaining cultural identity.

Trail: A linear route managed for human-powered, stock, or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

U

Unique Archaeological Resource: This term is used for the purposes of CEQA and is defined in CEQA Guidelines Section 15064.5 as an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it either contains information needed to answer important scientific research questions; has a special and particular quality such as being the oldest of its type or the best available example of its type; or, is directly associated with a scientifically recognized important prehistoric or historic event or person.

V

Vandalism (Cultural Resource): Malicious damage or the unauthorized collecting, excavating, or defacing of cultural resources. §6 of the Archaeological Resources Protection Act states that "no person may excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands…unless such activity is pursuant to a permit issued under section 4 of this Act."

Variables: Factors influencing visual perception including distance, angle of observation, time, size or scale, season of the year, light, and atmospheric conditions.

Variety: The state or quality of being varied and having the absence of monotony or sameness.

Viewshed: The landscape that can be directly seen under favorable atmospheric conditions, from a viewpoint or along a transportation corridor. Protection, rehabilitation, or enhancement is desirable and possible.

Visual Contrast: See Contrast.

Visual Quality: See Scenic Quality.

Visual Resources: The visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features).

Visual Resource Management Classes: Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape.

Visual Resource Management (VRM): The inventory and planning actions taken to identify visual values and to establish objectives for managing those values; and the management actions taken to achieve the visual management objectives.

Visual Values: See Scenic Quality.

W

Wetlands: Permanently wet or intermittently water-covered areas, such as swamps, marshes, bogs, potholes, swales, and glades.

Wilderness Area: An area formally designated by Congress as part of the National Wilderness Preservation System as defined in the Wilderness Act of 1964 (78 Stat. 891), Section 2(c).

Wilderness Study Area: A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).