# EXECUTIVE SUMMARY

## ES.1 INTRODUCTION

This environmental impact statement (EIS) documents and summarizes the environmental analysis of three separate projects proposed by NV Energy (also known as Sierra Pacific Power Company [SPPC]), Ormat Technologies, Inc. (Ormat), and Gradient Resources (formerly known as Vulcan Power Company [Vulcan]) in the Salt Wells area of Nevada. Together, the three projects are referred to as the Salt Wells Energy Projects (Proposed Actions).

In 2009, the United States (US) Department of the Interior (DOI), Bureau of Land Management (BLM) Stillwater Field Office (SFO) received an application for an electric transmission right-of-way (ROW) from SPPC and two separate geothermal utilization plans or plans of utilization (POUs) and applications for facility construction permits from Ormat and Vulcan. Since submission of the application by Vulcan, the company has changed their name to Gradient Resources. For consistency, the two companies will be referred to as SPPC and Vulcan in this document to coincide with the official applications to the BLM, although once permitted they will be doing business as NV Energy and Gradient Resources.

Combined, the three proposals could result in up to five 30- to 60-megawatt (MW) geothermal power plants with 71 associated wells, pipelines, and other facilities, and a 22-mile, up to 125-foot-wide right-of-way (ROW) for a new transmission line, with substations and switching stations. **Chapter 2**, Description of the Proposed Actions and Alternatives, describes the Proposed Actions and facilities, and **Appendix A**, Typical Geothermal Resource Development and Transmission Tools, explains the functions of these components in further detail. The proposed facilities would be sited on a combination of private property and federal land in the Carson City Consolidated Resource Area in Churchill County, Nevada, managed by the United States (US) Department of Interior (DOI), Bureau of Land Management (BLM) Stillwater Field Office (SFO) and the US Bureau of Reclamation (Reclamation).

In accordance with 43 Code of Federal Regulations (CFR) Parts 2800 and 3200, the BLM needs to consider whether to approve the applications to construct, operate, and maintain the proposed Salt Wells Energy Projects. Title V of the Federal Land Policy and Management Act of 1976 (FLPMA) authorizes the Secretary of the Interior (through the BLM) to grant ROWs over, upon, under,

or through public lands for the purposes of generating and transmitting electric energy. Because this is an externally generated proposal, the BLM must respond to the application filed by the applicants. In addition, Reclamation would use this analysis to develop a separate Record of Decision (ROD) to decide whether to approve a use authorization in the form of a ROW for the transmission line under its own regulations at 43 CFR Part 400. The regulations and management decisions for Reclamation are described in detail in Chapters 1 and 2 of the EIS.

The National Energy Policy Act of 2005 (EPAct 2005; Public Law 109-58) amended the Geothermal Steam Act and encourages the development of renewable and alternative energy resources, including geothermal energy, as part of an overall strategy to develop a diverse portfolio of domestic energy supplies. Section 211 of the Act calls for the Secretary of the Interior to approve non-hydropower renewable energy projects located on public lands, where appropriate, with a generation capacity of at least 10,000 MW of electricity by 2015. Additionally, the BLM's implementation strategy titled, BLM Implementation of the National Energy Policy, and other federal policies, including the Geothermal Steam Act of 1970, amended and supplemented by the EPAct of 2005; the Mining and Mineral Policy Act of 1970; the FLPMA; and the National Materials and Mineral Policy, Research and Development Act of 1980, direct the federal government to foster and encourage private enterprise to develop alternative energy resources with appropriate environmental constraints. If approved, the Salt Wells Energy Projects would provide new renewable energy sources and contribute to meeting these goals.

## ES.2 SUMMARY OF PROPOSED ACTIONS

### SPPC Proposed Action

SPPC is proposing to build two switching stations, one 230-kilovolt (kV) transmission line, two 60-kV electric line folds, and one substation. The new Switching Station, Bass Flat, would be constructed at the junction of the existing Fort Churchill to Austin 230-kV transmission line and the SPPC 230-kV transmission line leading from the existing ENEL Geothermal Power Plant to the Fort Churchill to Austin line. The new Pony Express Switching Station would be constructed adjacent to the existing ENEL Geothermal Power Plant. In addition, a new Greenwave Substation would be constructed on the south side of Sheckler Road in Fallon, Nevada, and a 230-kV transmission line would connect the proposed Pony Express Switching Station to the proposed Greenwave Substation. The transmission line would be approximately 22 miles long. Two 60-kV electric line folds would also be installed on four single-pole structures connecting the proposed Greenwave Substation to the existing 60-kV lines that are connected to the existing Fallon Substation north of Hammond Road. **Figure ES-1**, Sierra Pacific Power Company Proposed Action and Alternatives, shows the SPPC Proposed Action and the Alternatives described in Section 1.3.

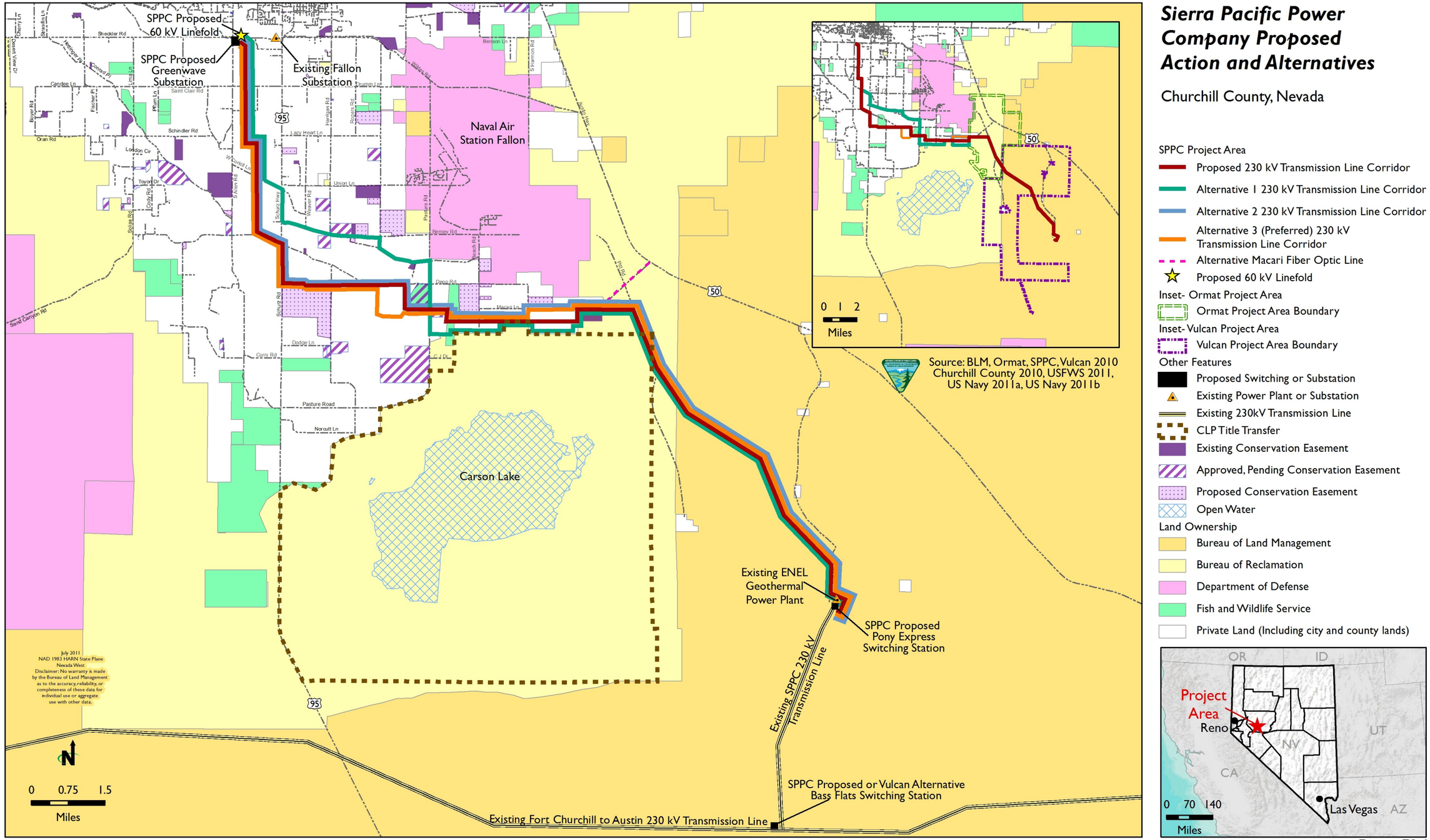
Sierra Pacific Power Company Proposed Action and Alternatives
Churchill County, Nevada
SPPC Proposed 60 kV Linefold
SPPC Proposed Greenwave Substation
Existing Fallon Substation
Naval Air Station Fallon
Carson Lake
Existing ENEL Geothermal Power Plant
SPPC Proposed Pony Express Switching Station
Existing SPPC 230 kV Transmission Line
SPPC Proposed or Vulcan Alternative Bass Flats Switching Station
Existing Fort Churchill to Austin 230 kV Transmission Line
Source: BLM, Ormat, SPPC, Vulcan 2010 Churchill County 2010, USFWS 2011, US Navy 2011a, US Navy 2011b
0 1 2
Miles
0 0.75 1.5
Miles
SPPC Project Area
Proposed 230 kV Transmission Line Corridor
Alternative 1 230 kV Transmission Line Corridor
Alternative 2 230 kV Transmission Line Corridor
Alternative 3 (Preferred) 230 kV Transmission Line Corridor
Alternative Macari Fiber Optic Line
Proposed 60 kV Linefold
Inset- Ormat Project Area
Ormat Project Area Boundary
Inset- Vulcan Project Area
Vulcan Project Area Boundary
Other Features
Proposed Switching or Substation
Existing Power Plant or Substation
Existing 230kV Transmission Line
CLP Title Transfer
Existing Conservation Easement
Approved, Pending Conservation Easement
Proposed Conservation Easement
Open Water
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Fish and Wildlife Service
Private Land (Including city and county lands)
OR
ID
Project Area
Reno
UT
NV
CA
Las Vegas
AZ
0 70 140
Miles

Figure ES-1

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Prior to construction, SPPC would finalize the Plan of Development (POD) to outline the specifics of how the proposed project would be constructed, operated, and maintained and would include monitoring measures to ensure all commitments are fulfilled. SPPC would implement the best management practices (BMPs) identified in **Appendix E**, Environmental Protection Measures and Best Management Practices, during construction and operation of the project.

### Ormat Proposed Action

Ormat is proposing to develop the Carson Lake Binary Power Plant and Substation, the Macari Switching Station, a 230-kV transmission line between the Carson Lake Substation and the Macari Switching Station, and an electric line fold for the SPPC 230-kV transmission line. The power plant would produce up to 40 MW (gross) electricity. These facilities would be developed on a private 80-acre parcel. Up to 13 well pads in addition to the 9 previously approved well pads on Reclamation land, associated pipelines, and roads would also be constructed on federal land. Ormat would adhere to the lease stipulations identified in **Appendix B**, Lease Stipulations and Conditions of Approval, during construction and operation of the project. Ormat would finalize the Plan of Utilization (POU) Plan prior to construction of their power facilities, similar to that described under the SPPC Proposed Action. Appropriate procedures as identified in **Appendix E**, Environmental Protection Measures and Best Management Practices, and mitigation measures outlined in this EIS would be included in the POU. **Figure ES-2**, Ormat Power Company Proposed Action and Alternative, shows the Ormat Proposed Action and Alternative described in Section 1.3.

### Vulcan Proposed Action

Vulcan is proposing to develop up to four power plants and associated substations at five possible locations for a maximum production of 120 MW (net). In addition, a 230-kV interconnection transmission line would be constructed to connect the power plant(s) to Vulcan's proposed Bunejug Switching Station and include an electric line fold to the SPPC 230-kV transmission line. Vulcan would also construct up to 26 well pads and associated wells, roads, and pipelines in addition to the 20 previously approved well pads (10 well pads were analyzed in EA-NV-030-07-05 and authorized February 6, 2007 and 10 well pads were analyzed in EA number DOI-BLM-NV-C010-2009-0006-EA and authorized April 24, 2009).

Vulcan would adhere to the lease stipulations identified in **Appendix B**, Lease Stipulations and Conditions of Approval, during construction and operation of the project. Vulcan would finalize the POU and develop a POD prior to construction of their power facilities and transmission line, similar to those described under the SPPC and Ormat Proposed Actions. Appropriate procedures, as identified in **Appendix E**, Environmental Protection Measures and Best Management Practices, and mitigation measures outlined in this EIS

would be included in the POU. **Figure ES-3**, Vulcan Power Company Proposed Action and Alternative, shows the Vulcan Proposed Action and Alternative described in Section 1.3.

## ES.3 ALTERNATIVES

### SPPC Alternatives

Four alternatives to the SPPC Proposed Action are evaluated in this EIS: Alternative 1 (Figure 2-15), Alternative 2 (Figure 2-16), Alternative 3 (Preferred; Figure 2-18), and the Macari Fiber Optic Alternative (Figure 2-17). Alternatives 1, 2, and 3 consider alternate routes for the proposed 230-kV transmission line. They represent a reasonable range of alternatives to the Proposed Action. The Macari Fiber Optic Alternative includes construction of an additional fiber optic line to connect communications from Highway 50.

### Ormat Alternatives

For the Ormat Project, the BLM developed an alternative to relocate Well pad Sites U and V and that portion of the pipeline and associated access road running from Well pad Site T to W (Figure 2-7) to protect riparian and surface waters within canals.

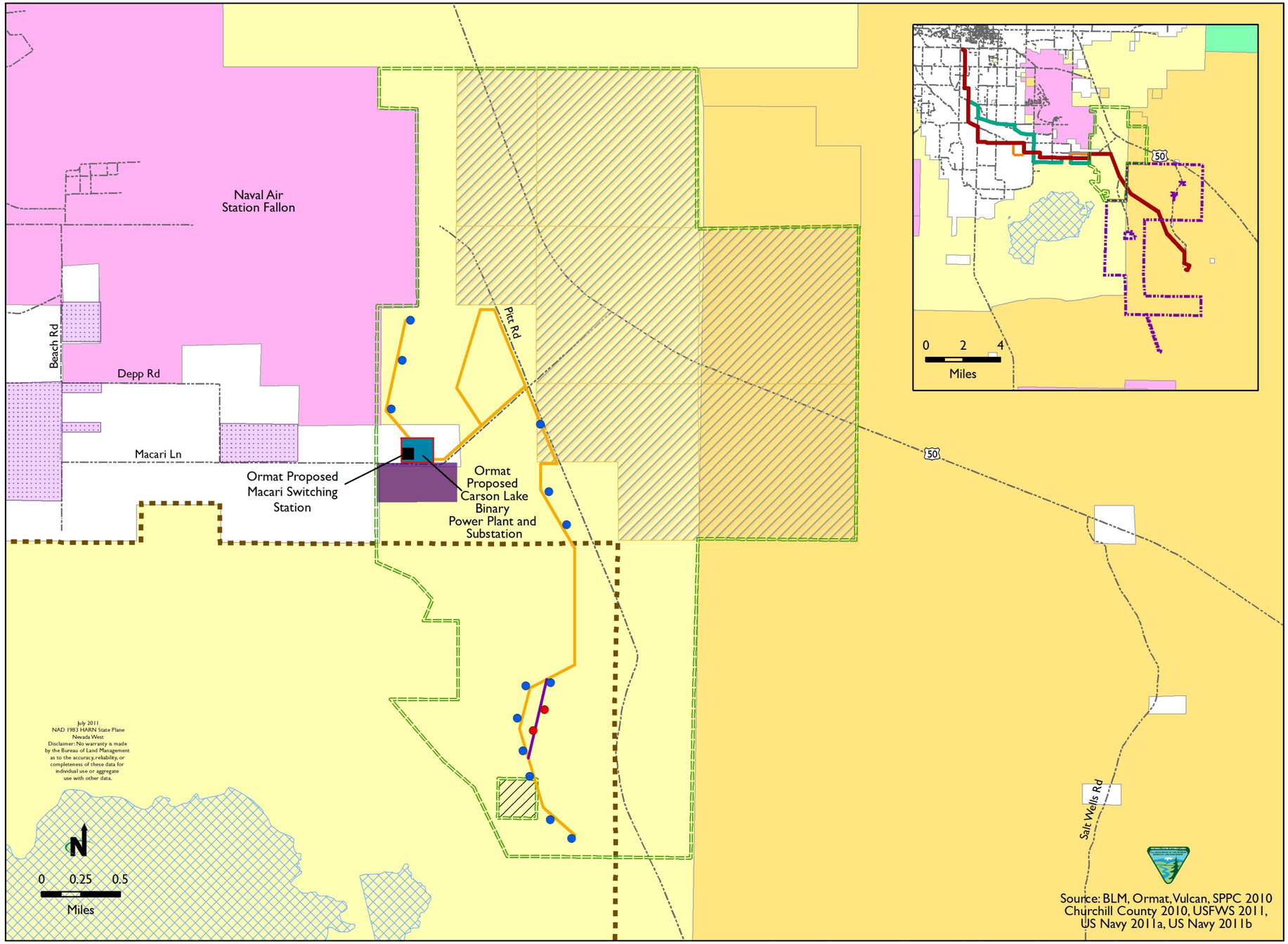
### Vulcan Alternatives

An alternative for the Vulcan project, should SPPC elect not to build its project, would be for Vulcan to build the Bass Flat Switching Station and extend its proposed 230-kV interconnection transmission line from the Power Plant Site 5 to their Alternative Bass Flat Switching Station (Figure 2-14). The Alternative Bass Flat Switching Station would be constructed as described under the SPPC Proposed Action and would allow Vulcan to tie into the existing Austin to Fort Churchill 230-kV transmission line (Figure 2-9). The transmission line from Power Plant Site 5 to the Bass Flat Switching Station would be constructed adjacent to an existing road. This transmission line extension would be constructed off lease and require an additional ROW application. Should this alternative be selected, Vulcan would prepare a POD prior to construction of the transmission line or switching station.

## ES.4 ISSUES SUMMARY

The primary issues were identified during public scoping and agency review of the proposed Salt Wells Energy Projects. To address the issues, the following land resources and uses are evaluated in the EIS:

- Land use authorizations, airspace, and access;
- Air quality;
- Minerals/geology;
- Soils;
- Farm lands (Prime or Unique);




## *Ormat Proposed Action and Alternative*

Churchill County, Nevada

Ormat Facilities
- Ormat Project Area Boundary
- Proposed Well Pad
- Alternative Well Pad
- Proposed Pipeline
- Alternative Pipeline
- Proposed Power Plant and Substation

Inset Map- Vulcan Project Area
- Vulcan Project Area Boundary

Inset Map- SPPC Project Area
- Proposed 230 kV Transmission Line Corridor
- Alternative 1 230 kV Transmission Line Corridor
- Alternative 2 230 kV Transmission Line Corridor
- Alternative 3 (Preferred) 230 kV Transmission Line Corridor

Other Features
- Proposed Switching Station
- CLP Title Transfer
- Existing Conservation Easement
- Proposed Conservation Easement
- No Surface Occupancy
- Open Water
- Excluded from Lease Area

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Fish and Wildlife Service
- Private Land (Including city and county lands)

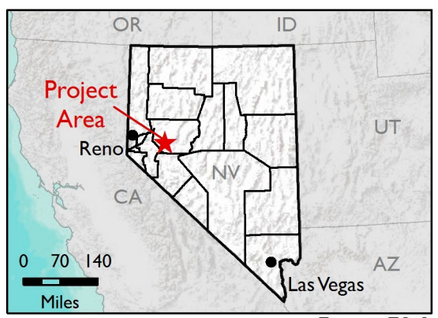



Figure ES-2

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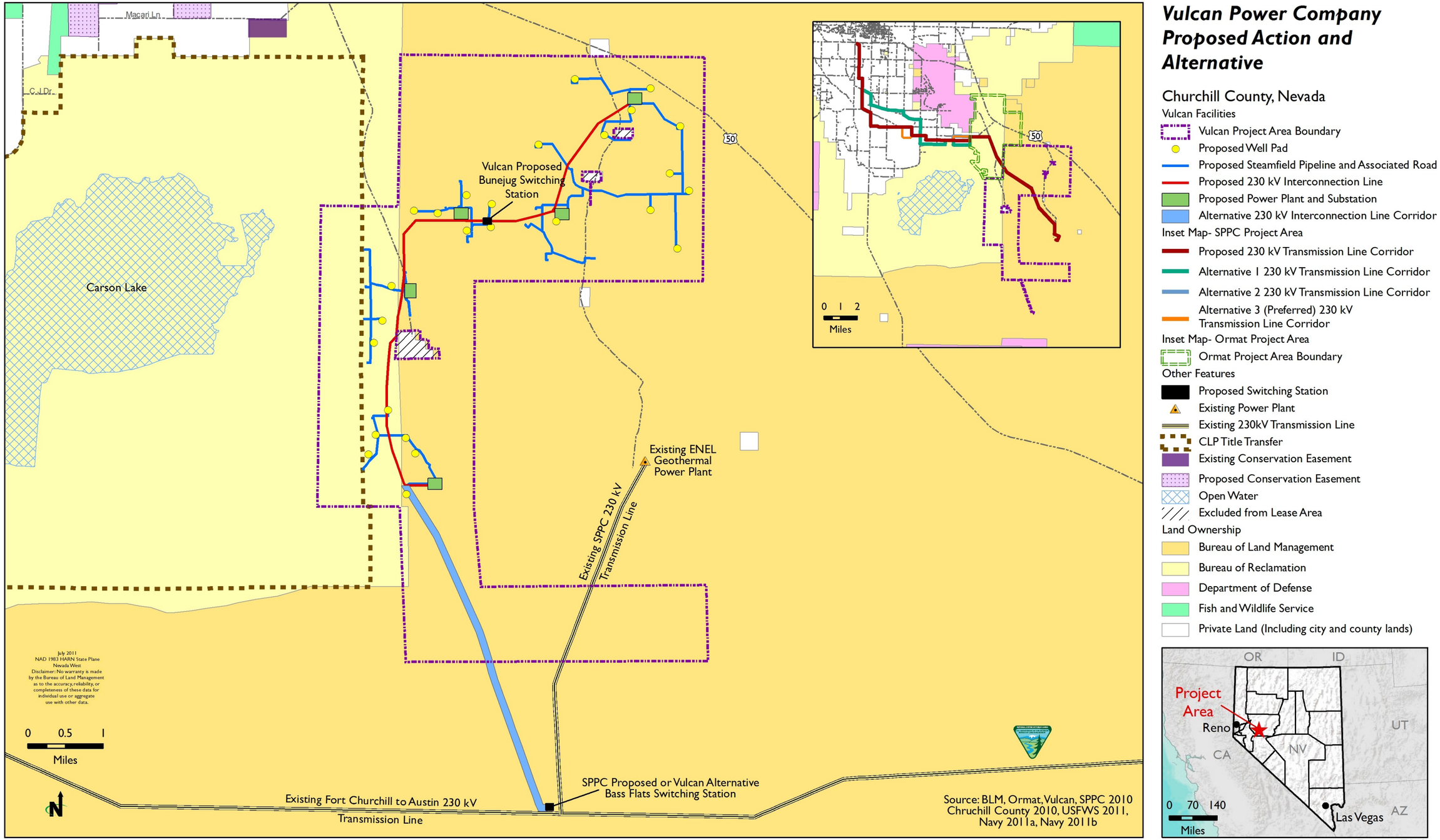
Vulcan Power Company
Proposed Action and
Alternative
Churchill County, Nevada
Vulcan Facilities
Vulcan Project Area Boundary
Proposed Well Pad
Proposed Steamfield Pipeline and Associated Road
Proposed 230 kV Interconnection Line
Proposed Power Plant and Substation
Alternative 230 kV Interconnection Line Corridor
Inset Map- SPPC Project Area
Proposed 230 kV Transmission Line Corridor
Alternative 1 230 kV Transmission Line Corridor
Alternative 2 230 kV Transmission Line Corridor
Alternative 3 (Preferred) 230 kV Transmission Line Corridor
Inset Map- Ormat Project Area
Ormat Project Area Boundary
Other Features
Proposed Switching Station
Existing Power Plant
Existing 230kV Transmission Line
CLP Title Transfer
Existing Conservation Easement
Proposed Conservation Easement
Open Water
Excluded from Lease Area
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Fish and Wildlife Service
Private Land (Including city and county lands)
Macari Ln
C J Dr
Carson Lake
Vulcan Proposed Bunejug Switching Station
Existing ENEL Geothermal Power Plant
Existing SPPC 230 kV Transmission Line
SPPC Proposed or Vulcan Alternative Bass Flats Switching Station
Existing Fort Churchill to Austin 230 kV Transmission Line
50
0 1 2
Miles
0 0.5 1
Miles
July 2011
NAD 1983 HARN State Plane Nevada West
Disclaimer: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.
Source: BLM, Ormat, Vulcan, SPPC 2010
Chruchill County 2010, USFWS 2011,
Navy 2011a, Navy 2011b
OR
ID
UT
NV
CA
AZ
Project Area
Reno
Las Vegas
0 70 140
Miles

Figure ES-3

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- Water quality and quantity;
- Floodplains, wetlands, and riparian zones;
- Vegetation;
- Invasive, nonnative species;
- Wildlife;
- Migratory birds;
- BLM-designated sensitive species (animal and plant);
- Cultural resources;
- Native American religious concerns;
- Paleontological resources;
- Visual resources;
- Livestock grazing;
- Recreation;
- Special designations (including Areas of Critical Environmental Concern and Wilderness);
- National scenic and historic trails;
- Noise;
- Public health and safety;
- Fire management;
- Wastes, hazardous or solid;
- Future Management of Carson Lake and Pasture;
- Protection of Newlands Project Facilities;
- Social and economic values; and
- Environmental justice.

## ES.5 SUMMARY OF IMPACTS

Where potential impacts associated with the Proposed Actions are unique to the SPPC Project, Ormat Project, or Vulcan Project, the description of those impacts are distinguished. Where potential impacts are common to all three Proposed Projects, no distinction is noted. **Table ES-1**, Acres of Proposed Disturbance by Project, summarizes the total acres of temporary and permanent disturbance by project and alternatives.

## Land Use Authorizations, Airspace, and Access

### *SPPC Project*

Implementation of the Proposed Action or Alternatives would not change any land uses within the SPPC Project Area. Construction and maintenance of the transmission line could have impacts on the adjacent land uses where the Proposed Action route crosses conservation easements. Alternative 1 would avoid existing and proposed conservation easements.

**Table ES-1**
**Acres of Proposed Disturbance by Project**

| Project or Alternative | Temporary Disturbance (acres) | Permanent Disturbance (acres) |
|---|---|---|
| SPPC Proposed Action | 813 | 352 |
| SPPC – Alternative 1 | 838 | 362 |
| SPPC – Alternative 2 | 813 | 352 |
| SPPC – Alternative 3 (Preferred) | 796 | 332 |
| SPPC – Macari Fiber Optic Alternative | 1 | 1 |
| Ormat Proposed Action | 321 | 197 |
| Ormat Alternative (Preferred) | 318 | 195 |
| Vulcan Proposed Action (Preferred) | 1,254 | 750 |
| Vulcan Alternative | 1,427 | 826 |

A portion of the Proposed Action and alternative routes would be located within APZ2, which is a Navy-designated accident potential zone (APZ) with a low potential for aircraft accidents. No impacts on land use, airspace, and access from the Greenwave Substation or Bass Flat Switching Station are anticipated.

Access would be via existing roads where feasible. Use of the existing roads and the temporary spur and centerline roads would not impact access in the region of influence (ROI).

### *Ormat Project*

Implementation of the Proposed Action and the Alternative would not change any land uses within the ROI. The project would not conflict with existing federal, state, and local land uses, plans, and policies or with existing BLM or Reclamation land use authorizations (See **Appendix F**, Land Use Authorizations in the Salt Wells Energy Projects Area).

As proposed, the wells, pipelines, and power plant located within the APZ1 and APZ2 areas would not have impacts on naval operations or increase risks for aircraft accidents.

The Project Area would be accessed via Highway 50 and Macari Lane. Impacts on access would occur if the historic segments of the Lincoln Highway or Old Highway 50 were damaged during construction and operation under the Proposed Action. A mitigation measure would be implemented to reduce the likelihood for impacts.

***Vulcan Project***

Impacts on land use authorizations would be similar to those described for the Ormat Project. Impacts on access would be similar to those described for the Ormat Project.

The power plant and well locations proposed under the Proposed Action would not be located in or near an APZ area. The Proposed Action would not conflict with proposed naval operations or impact airspace in the ROI.

## Air Quality

***Salt Wells Energy Projects***

For all Proposed Actions and Alternatives, construction and well drilling activities would be the greatest source of emissions. Site grading would generate temporary and localized fugitive dust emissions. Vehicle use would generate temporary criteria air pollutants and greenhouse gas emissions. The quantities of emitted pollutants would vary by project (Tables 4-1, 4-2, 4-3, 4-4, 4-5). BMPs would be implemented to reduce impacts. Operation of the Salt Wells Energy Projects would not result in any violations of state or federal air quality standards.

## Minerals/Geology

***Salt Wells Energy Projects***

No potential impacts on geological and mineral resources are expected to result from any of the Proposed Actions and for most of the alternatives. Construction and operation of the proposed geothermal power plants and ancillary wells and pipeline infrastructure would not limit access to mineral resources and would not preclude development of mineral resources in the SPPC Project Area. The exception is that SPPC Alternative 2 could cause increases in erosion and runoff rates at construction sites.

## Soils

***Salt Wells Energy Projects***

For all Proposed Actions and Alternatives, potential direct impacts on soil resources would occur during soil salvage operations and soil redistribution activities, where soil could be lost, or biological, physical, and chemical activity within the soils could be altered. Soils would be directly impacted by grading activities during construction. In addition, some areas may be subject to deposition of wind-blown material outside the footprint of construction areas,

or loss of soil due to wind erosion. Impacts would differ among alternatives relative to the amount of acreage that would be disturbed. BMPs and measures in the POD/POU would be implemented to reduce impacts.

## Farm Lands (Prime or Unique)

***SPPC Project***

No land is classified as Unique Farmland in the Salt Wells Energy Projects Area. All potential Prime Farmland in the Projects Area requires irrigation, abatement of salts, or depends upon climatic and wind erosion variables to qualify as Prime Farmland. The Proposed Action would cause the least temporary disturbance to potential Prime Farmland under all Alternatives (Table 4-6). For all Alternatives, slightly more than one acre of potential Prime Farmland would be converted directly to non-farm land. Mitigation measures would be implemented to reduce impacts.

***Ormat Project***

There are 198.6 acres of potential Prime Farmland in the Ormat Survey Area, of which 193 acres would require abatement of salts and sodium to qualify as Prime Farmland. Under the Proposed Action, all of this acreage would be permanently unavailable as Prime Farmland. Impacts from the Ormat Alternative would be similar, though slightly less. Environmental Protection Measures in **Appendix E** would be implemented to reduce impacts.

***Vulcan Project***

No Prime or Unique Farmlands are located in the Vulcan Project Area; therefore, the Proposed Action and Alternative would not impact Prime or Unique Farmlands.

## Water Quality and Quantity

***SPPC Project***

Potential impacts on water resources such as spills of hazardous materials, erosion, and sedimentation would be temporary and would be reduced by implementation of BMPs, Environmental Protection Measures, and measures within the POD. Impacts would vary among Alternatives relative to the amount of acreage that would be disturbed.

***Ormat Project***

Impacts on water quality and quantity for the Proposed Action and Alternative would be similar to those described for the SPPC Project. Temporary impacts could occur from use of reserve pits at each well pad during construction. During power plant operation, extraction and reinjection of geothermal water could impact flows and water quality at hot and warm springs and seeps. Since most of the extracted groundwater would be returned to the geothermal source aquifer via injection wells, the volume of groundwater in these aquifers is not expected to be reduced substantially over the life of the operation. During

pumping, however, some groundwater flow paths in the deeper aquifers could be modified.

Long-term pumping of geothermal reservoirs and reductions in temperatures prior to reinjection could reduce pressures within the deeper geothermal system. The magnitude of upward vertical hydraulic gradients could be reduced as a result of depressurization of the system.

Ormat would purchase water rights from an existing canal water right holder for the necessary amount of cooling water. Wastewater would be disposed via an on-site septic system. BMPs and measures in the POU would be implemented to reduce impacts on water quality and quantity. In addition, mitigation of potential impacts could be addressed by development of monitoring plans for these water resources.

***Vulcan Project***

Impacts on water quality and quantity from the Proposed Action and Alternative would be similar to those described for the Ormat Project. The Vulcan Project would require more water for electricity generation and cooling because Vulcan would construct up to four power plants. BMPs and mitigation measures would be similar to those described for the Ormat Project.

## Floodplains, Wetlands, and Riparian Zones

***SPPC Project***

The Proposed Action and Alternatives cross wet meadows. Construction of a transmission line in these areas could have direct impacts on wetland areas, including permanent removal of wetland vegetation. BMPs and measures in the POD would be implemented to reduce impacts on wetlands. Additional mitigation and monitoring measures would be implemented to further reduce impacts.

***Ormat Project***

The Proposed Action and Alternative could affect seasonal wetlands, including wet meadows and playas, causing impacts similar to those described above for the SPPC Project. BMPs, measures in the POU, would be implemented to reduce impacts. In addition, mitigation of potential impacts could be addressed by development of monitoring plans for water resources.

***Vulcan Project***

Impacts on playas from the Vulcan Proposed Action and Alternative would be similar to those described under the Ormat Project. A greater acreage of playa would be affected by the Vulcan Project. BMPs, measures in the POD/POU, and mitigation measures would be similar to those described for the Ormat Project.

## Vegetation

### *SPPC Project*

Impacts on vegetation from the Proposed Action and Alternatives would include temporary and permanent loss of vegetation communities from construction, operation, and maintenance of the project (e.g., transmission lines, access roads, substation, switching stations, and associated facilities). BMPs and measures included in the POD would help to reduce impacts. For the Proposed Action and Alternatives 1, 2 and 3, most impacts would occur on the agriculture and developed vegetation community. The fewest permanent impacts would be caused by the Proposed Action and Alternatives 2 and 3, which would disturb approximately 352 acres of vegetation. The Macari Fiber Optic Alternative would disturb one acre of greasewood flat vegetation.

### *Ormat Project*

Impacts on vegetation from the Proposed Action and Alternative would be similar to those described for the SPPC Project. Loss of vegetation communities would be associated with construction of the switching station, pipelines, well pads, access roads, and transmission line. Most impacts would occur in the greasewood flat vegetation community, although the Carson Lake Binary Power Plant and Substation would be located on disturbed land, dominated by invasive species. The Proposed Action would permanently disturb 197 acres of vegetation, and the Alternative would have permanent impacts on 195 acres.

### *Vulcan Project*

Impacts on vegetation from the Proposed Action and Alternative would be similar to those described for the SPPC Project. Loss of vegetation communities would be associated with construction of four possible power plants, switching stations, pipelines, well pads, access roads, and a transmission line. Most impacts would occur in the mixed salt desert scrub community. The Proposed Action would permanently disturb 750 acres of vegetation, and the Alternative would disturb 826 acres.

## Invasive, Nonnative Species

### *Salt Wells Energy Projects*

For all Proposed Actions and Alternatives, soil disturbance and plant removal during construction activities could lead to the introduction and spread of invasive, nonnative species, including noxious weeds. Any ground disturbance could create favorable conditions for invasive, nonnative species to be introduced, to spread, or to become well established. However, vegetation clearing or ground-disturbing activities would be restricted to the minimum amount necessary to lessen potential impacts. Additionally, BMPs and measures included in the POD/POU would reduce the spread or introduction of invasive, nonnative species.

## Wildlife

### *SPPC Project*

The SPPC Proposed Action or Alternatives could cause death or injury to wildlife; disturb species due to lighting, noise, and human presence; degrade, fragment, or convert wildlife habitats; or provide habitat for predators. BMPs and measures included in the POD would reduce impacts on wildlife.

### *Ormat Project*

Impacts on wildlife from the Proposed Action or Alternative would be similar to those described above for the SPPC Project. Impacts within the Ormat Project Area would be more concentrated; despite covering a smaller acreage, these impacts would occur closer together geographically. Impacts from the transmission line would be less than those for the SPPC Project, since the Ormat transmission line is shorter. However, Ormat's proposed and alternative pipelines could alter movement for some wildlife species. BMPs and measures included in the POU would reduce impacts on wildlife.

### *Vulcan Project*

Impacts on wildlife from the Proposed Action or Alternative would be similar to those described for the SPPC Project. The size of the project (4 possible power plants, 8 miles of transmission lines, 19 miles of pipeline, and up to 26 new well pads) would permanently and temporarily impact a large amount of habitat. BMPs and environmental protection measures included in the POD/POU would reduce impacts on wildlife.

## Migratory Birds

### *SPPC Project*

Construction and operation of the SPPC Project under the Proposed Action and Alternatives may impact migratory birds and their habitat through disturbance and habitat fragmentation. This may affect migratory patterns and habitat use by migratory birds, and result in permanent degradation of habitat quantity and quality. Other direct impacts could result from project components, such as the 22-mile-long transmission line, that may change patterns of avian movement to and from Carson Lake and Pasture, increase risk of collision with power lines, and increase predation by providing more perching opportunities. Potentially occurring BLM-designated sensitive bird species include golden eagle, Swainson's hawk, loggerhead shrike, long-billed curlew, burrowing owl, and short-eared owl. Other potentially occurring bird species include US Fish and Wildlife Service (USFWS) Birds of Conservation Concern (USFWS 2008) and Game Birds Below Desired Condition. BMPs and measures included in the POD would reduce impacts on migratory birds.

***Ormat Project***

Impacts on migratory birds from the Proposed Action or Alternative would be similar to those described above for the SPPC Project. Impacts from operation of the Ormat transmission line would be fewer, since it would only be 200 feet long. Furthermore, there would be fewer impacts on migratory birds which utilize agricultural areas, since this habitat type would not be affected by the Ormat Project. Potentially occurring BLM-designated sensitive bird species include golden eagle, prairie falcon, Swainson's hawk, loggerhead shrike, long-billed curlew, snowy plover, and short-eared owl. Other potentially occurring bird species include USFWS Birds of Conservation Concern (USFWS 2008) and USFWS Game Birds Below Desired Condition. BMPs and measures included in the POU would reduce impacts on migratory birds.

***Vulcan Project***

Impacts on migratory birds from the Proposed Action or Alternative would be similar to those described for the SPPC Project. The likelihood for impacts would be greater for the Vulcan Project due to the larger acreage that would be affected and the larger number of migratory birds that were observed within the Vulcan Project Area. Potentially occurring BLM-designated sensitive bird species include golden eagle, prairie falcon, Swainson's hawk, loggerhead shrike, long-billed curlew, snowy plover, and burrowing owl. Other potentially occurring bird species include USFWS Birds of Conservation Concern (USFWS 2008) and USFWS Game Birds Below Desired Condition. Golden eagle is known to nest near Vulcan's proposed and alternative facilities, and mitigation measures would be implemented to reduce impacts on this species. BMPs and measures included in the POD/POU would reduce impacts on other migratory birds.

### BLM-Designated Sensitive Species (Animals and Plants)

***SPPC Project***

Impacts from the Proposed Action or Alternatives on BLM-designated sensitive species would be similar to those described for wildlife and migratory birds. Birds are the only BLM-designated sensitive species that could be impacted within the SPPC Project Area and impacts on these species are described in **Section 4.12**. BMPs and measures included in the POD would reduce impacts on BLM-designated sensitive species.

***Ormat Project***

Impacts on BLM-designated sensitive species as a result of the Proposed Action or Alternative would be similar to those described for the SPPC Project. Potentially impacted BLM-designated sensitive species include BLM-designated sensitive bird species (described in **Section 4.12)**, BLM-designated sensitive bat species, and pallid wood nymph. BMPs and measures included in the POU would reduce impacts on BLM-designated sensitive species. An additional mitigation measure would be implemented to ensure that there would be no impacts on pallid wood nymph.

***Vulcan Project***

Impacts on BLM-designated sensitive species from the Proposed Action or Alternative would be similar to those described for the SPPC Project. Potentially impacted BLM-designated species include BLM-designated sensitive bird species (described in **Section 4.12)**, BLM-designated sensitive bat species, and the pallid wood nymph. BMPs and measures included in the POD/POU would reduce impacts on BLM-designated species.

## Cultural Resources

***Salt Wells Energy Projects***

Archaeological and architectural history Class III inventories and National Register of Historic Places (NRHP) evaluations are ongoing. Preliminary findings indicate historic properties from previous investigations and from the ongoing work may be adversely impacted during any ground disturbing construction activity in the Salt Wells Energy Projects Area. Use of historic property avoidance and development of treatment plans, as specified in **Appendix D**, Programmatic Agreement for the Salt Wells Energy Projects, the Programmatic Agreement between the BLM, Reclamation, the State Historic Preservation Office, and SPPC, Ormat, and Vulcan for unavoidable significant cultural resources, would assure mitigation or avoidance occur on all historic properties receiving potential adverse ground disturbing effects.

## Native American Religious Concerns

***Salt Wells Energy Projects***

The Native American consultation process is ongoing. During consultation for the Proposed Actions and Alternatives, the following concerns were identified: cultural resources, including historic properties; continued access and use of traditional use sites; and other resources that may be affected by the current project.

Access to or the use of traditional use sites may be temporarily impacted during the construction phase of the projects. No direct permanent impacts on access to or the use of traditional use sites within the project area have been identified.

## Paleontological Resources

***Salt Wells Energy Projects***

It is unlikely that the Proposed Actions or Alternatives would affect geologic units that have the potential to contain paleontological resources. If paleontological resources are present within the Projects Area, impacts on those resources are more likely to occur where ground disturbance takes place and the work site has not experienced substantial prior disturbance. If paleontological localities are identified in the Projects Area, mitigation and monitoring measures would be implemented to reduce impacts.

## Visual Resources

### *SPPC Project*

Under the Proposed Action and Alternatives, visual impacts would be most apparent where the transmission line would follow roads since the roads are the primary source of traffic in the SPPC Project Area. Visual impacts from the transmission line would vary by alternative depending on the length of the line and the locations relative to sensitive receptors. The two 60-kV electric line folds would consist of four new poles in the existing alignment, so it would not be visible to the casual observer from the road or the nearby elementary school. The four new single-pole angle structures across Sheckler Road would be visible from the road but would be close enough to the existing poles that there would not be much of a change in the visual character of the area. The poles are more than 0.5 mile away and would not be visible or would be barely visible from the school due to a vegetated buffer along the edge of the school property.

The two proposed switching stations would be built immediately adjacent to existing structures. The substation would be larger than the two switching stations and would thus cover more land area. The switching stations and substation would be visible from the existing structures in the immediate area. BMPs and mitigation measures would be implemented to reduce visual impacts.

### *Ormat Project*

The Proposed Action and Alternative would have visual impacts on public land. Viewsheds from Grimes Point Lookout and Macari Lane, though affected, would meet VRM Class III standards. The proposed power plant and associated structures, well pads, and pipelines would be a noticeable change to the visual features and character of the rural area. The power plant, in particular, would be a visible and very noticeable change. The Grimes Point Archaeological Site is a sensitive receptor, and the power plant area would be visible and may be disruptive to recreational visitors and sightseers. The pipeline corridor and well pads would be most apparent from roads and a noticeable change to the area. The overall visual impact would vary in different areas. There would be a visual impact on views from Grimes Point Lookout and on BLM land east of Macari Lane. However, the Proposed Action and Alternative would meet the VRM Class III objectives.

### *Vulcan Project*

Viewsheds from Highway 50 and the Pony Express National Historic Trail would be affected by the Vulcan Proposed Action and Alternative. The four proposed power plants and associated structures, well pads, and pipelines would be a noticeable change to the visual features and character of the mostly undeveloped area. Power Plant Sites 1 and 4, in particular, are visible from the highway and would be noticeable change. The pipeline corridor and well pads would also be a noticeable change to the area, and would be somewhat visible

from Highway 50. The Pony Express National Historic Trail is a sensitive receptor and the binary or flash power plant, associated structures, and alternative transmission line would be visible and may be disruptive to recreational visitors and sightseers. The overall visual impact of the Proposed Action would vary. There would be visual impacts from the Pony Express National Historic Trail and some points along Highway 50. However, the Proposed Action and Alternative would meet the VRM Class III objectives.

## Livestock Grazing

### *SPPC Project*

The SPPC Proposed Action and Alternatives 1, 2, and 3 impact two BLM grazing allotments. The Macari Fiber Optic Alternative does not impact any BLM grazing allotments. The Greenwave Substation would be located on private land and would not impact public livestock grazing. Most impacts would be temporary and associated with construction. These impacts would include temporary loss of forage, harassment and displacement of cattle, and alteration of range improvements to accommodate construction traffic. Mitigation measures would be implemented to reduce impacts on livestock grazing.

### *Ormat Project*

The Ormat Proposed Action and Alternative overlap with two pastures on Reclamation lands. The Proposed Action and Alternative do not impact any BLM grazing allotments. Impacts and mitigation measures would be similar to those identified for the SPPC Project.

### *Vulcan Project*

The Vulcan Proposed Action and Alternative impacts two BLM grazing allotments and one pasture on Reclamation lands. Impacts and mitigation measures would be similar to those identified for the Ormat Project.

## Recreation

### *SPPC Project*

Under the Proposed Action and Alternatives, temporary access and centerline roads would be constructed and could result in increased off-highway vehicle (OHV) use of the areas until the roads are reclaimed. Construction could also result in temporary access restrictions for recreational users on Reclamation- or BLM-administered lands. The Proposed Action and Alternatives could potentially conflict with the Valley Off-Road Racing Association (VORRA) race route; mitigation measures would be implemented to prevent these conflicts. The SPPC Proposed Action and Alternatives would not result in direct impacts on recreation at the Pony Express National Historic Trail, the Grimes Point Archaeological Site, or Hidden Cave.

***Ormat Project***

Impacts from the Proposed Action and Alternative would be similar to those described for the SPPC Proposed Action. However, the Ormat Project would not conflict with the VORRA race route. Due to its proximity to Carson Lake and Pasture, mitigation measures would be implemented to reduce impacts on recreationists in that area.

***Vulcan Project***

Impacts and mitigation measures for the Proposed Action and Alternative would be similar to those described for the SPPC Proposed Action. In addition, due to its proximity to Carson Lake and Pasture, mitigation measures would be implemented to reduce impacts on recreationists in that area.

## Special Designations (Including Areas of Critical Environmental Concern and Wilderness)

***Salt Wells Energy Projects***

There are no special designation areas within or adjacent to the Salt Wells Energy Projects Area; therefore, there would be no impacts from the Proposed Actions or the Alternatives.

## National Scenic and Historic Trails

***SPPC Project***

Impacts on National Scenic and Historic Trails are not anticipated from the Proposed Action or Alternatives.

***Ormat Project***

Impacts on National Scenic and Historic Trails are not anticipated from the Proposed Action or Alternative.

***Vulcan Project***

Under the Proposed Action and Alternative, Power Plant Site 5, as well as associated structures, would be visible from a portion of the Pony Express National Historic Trail, causing visual impacts. Mitigation measures would be implemented to reduce impacts. The Alternative would also cross the Pony Express National Historic Trail, causing temporary construction-related effects and permanent visual effects. Mitigation measures would be implemented to reduce impacts.

## Noise

***SPPC Project***

The construction and maintenance of the transmission lines and substations as proposed under the Proposed Action and Alternatives would involve noise-making activities from blasting and equipment used for drilling, earth moving, and hauling. Construction noise could affect sensitive receptors, but impacts are

expected to be temporary and infrequent. The number of and distance to sensitive receptors would vary according to the siting of each alternative. BMPs would be implemented to reduce noise impacts.

Operation of the SPPC project components would result in noise from the transmission lines and towers, noise from activities for routine inspection and maintenance of the new facilities, and noise from the switching station and substation facilities. Noise from routine maintenance is considered to be low and intermittent and would not represent an impact on any sensitive receptors.

Residents of properties near the substation could be impacted by operational noise of the transformers. The layout of the substation and the noise impacts on nearby residences would be addressed during the Churchill County permitting process for the facility.

Impacts from corona, insular, and eolian noise from the transmission line are expected to be minimal, especially considering the existing noise levels from NAS Fallon.

***Ormat Project***

Expected sources of noise associated with the Proposed Action and Alternative include construction activities (earth-moving equipment for road, well pad, and sump pit construction), drilling operations, well testing, and power plant operation. The Ormat Project would potentially impact one sensitive receptor, a nearby residence. Construction noise at this residence is projected to be no greater than 62.5 A-weighted decibels (dBA), and noise from power plant operation is projected to be no greater than 50.7 dBA at the residence. Mitigation measures would be implemented to reduce noise impacts.

***Vulcan Project***

There are no noise-sensitive receptors near the Vulcan Project Area. No direct noise impacts on humans are anticipated from the Proposed Action or Alternative.

## Public Health and Safety and Fire Management

***SPPC Project***

It is anticipated that that the electromagnetic fields (EMFs) for the Proposed Action and Alternatives would be less than the most stringent state standards for transmission line EMFs at the edge of the ROW, and that EMFs associated with the substation and switching station equipment would be low at locations beyond the property.

Use of hazardous materials during project construction, operation, and maintenance would pose potential health and safety hazards to construction and maintenance workers and nearby residents. Furthermore, construction, operation, and maintenance can affect general public safety along the

transmission line routes, in staging areas, and at the proposed substation and switching station sites. BMPs and Environmental Protection Measures would be implemented to reduce impacts on public health and safety.

***Ormat Project***

Impacts on public health and safety from the Proposed Action or Alternative would be similar to those described for the SPPC Project. However, impacts caused by EMF would be less of a concern for the Ormat Project, as the transmission line is only 200 feet long. BMPs and Environmental Protection Measures would be implemented to reduce impacts on public health and safety.

***Vulcan Project***

Direct impacts on public health and safety from the Proposed Action or Alternative would be similar to those described for the SPPC Project. However, impacts caused by EMF would be less of a concern for the Vulcan Project, as the 230-kV interconnection line, switching station, and power plants are not located near residences or developed areas. BMPs and Environmental Protection Measures would be implemented to reduce impacts on public health and safety.

## Fire Management

***Salt Wells Energy Projects***

Construction, operation, and maintenance of facilities associated with the Salt Wells Energy Project, such as transmission lines, switching stations, well pads, power plants, and substations for the Proposed Actions or Alternatives, could increase the potential for a fire in the Salt Wells Energy Projects Area. Increased access to public lands could indirectly raise the risk of ignition of wildfires from smoking, camping, and other activities on public lands. BMPs and Environmental Protection Measures would be implemented to reduce the likelihood of fire impacts.

## Wastes, Hazardous or Solid

***SPPC Project***

No hazardous materials were known to be stored within the SPPC Survey Area; therefore, the Proposed Action and Alternatives would not expose workers to any preexisting hazardous materials and wastes not associated with the Proposed Action or Alternatives during construction, operation, and maintenance.

Project construction and operation phases would involve hazardous material use. The transport, use, or disposal of such hazardous materials could affect workers, the public, and the environment through accidental spills or emissions. BMPs and Environmental Protection Measures would be implemented to reduce impacts from hazardous or solid wastes.

***Ormat Project***

Impacts would be similar to those described for the SPPC Project. In addition, the geothermal power plant would comply with all local, state, and federal regulations regarding the use, transport, storage, and disposal of hazardous materials and wastes. A detailed POU, as part of the reclamation plan, would be developed in consultation with the US Navy, BLM, Reclamation, and other stakeholders before the plant is built and operated.

***Vulcan Project***

Impacts would be similar to those described for the Ormat Project.

## Social and Economic Values

***SPPC Project***

The Proposed Action and Alternatives may cause slight increases in population and economic activity within Churchill County during project construction.

The development of the SPPC Project would necessitate the acquisition of easements over private property for the development of the transmission line. SPPC would provide financial compensation to private property owners when acquiring a property easement. The properties that would be affected would vary by alternative (Table 4-19). The SPPC Project could also result in slightly decreased property values for nearby lands.

***Ormat Project***

The Proposed Action and Alternative may cause slight increases in population and economic activity within Churchill County during project construction.

The proposed power plant, substation and switching station would all occur on private land owned by Ormat. Proposed pipelines and wells would be located on public land. Therefore, there would be no impacts on land value associated with the Proposed Action or Alternative.

***Vulcan Project***

Impacts from the Proposed Action and Alternative would be similar to the Ormat Project. However, since the Vulcan Project would involve construction of more facilities, it would cause a greater increase in population and economic activity within Churchill County during project construction.

## Environmental Justice

***Salt Wells Energy Projects***

There are no known minority populations fitting the definition for environmental justice concerns within the Salt Wells Energy Projects Area. In addition, there is not a meaningfully greater low-income population in the Projects Area than for the county as a whole. Therefore, there would be no

direct or indirect impacts anticipated as a result of the Proposed Actions or Alternatives.