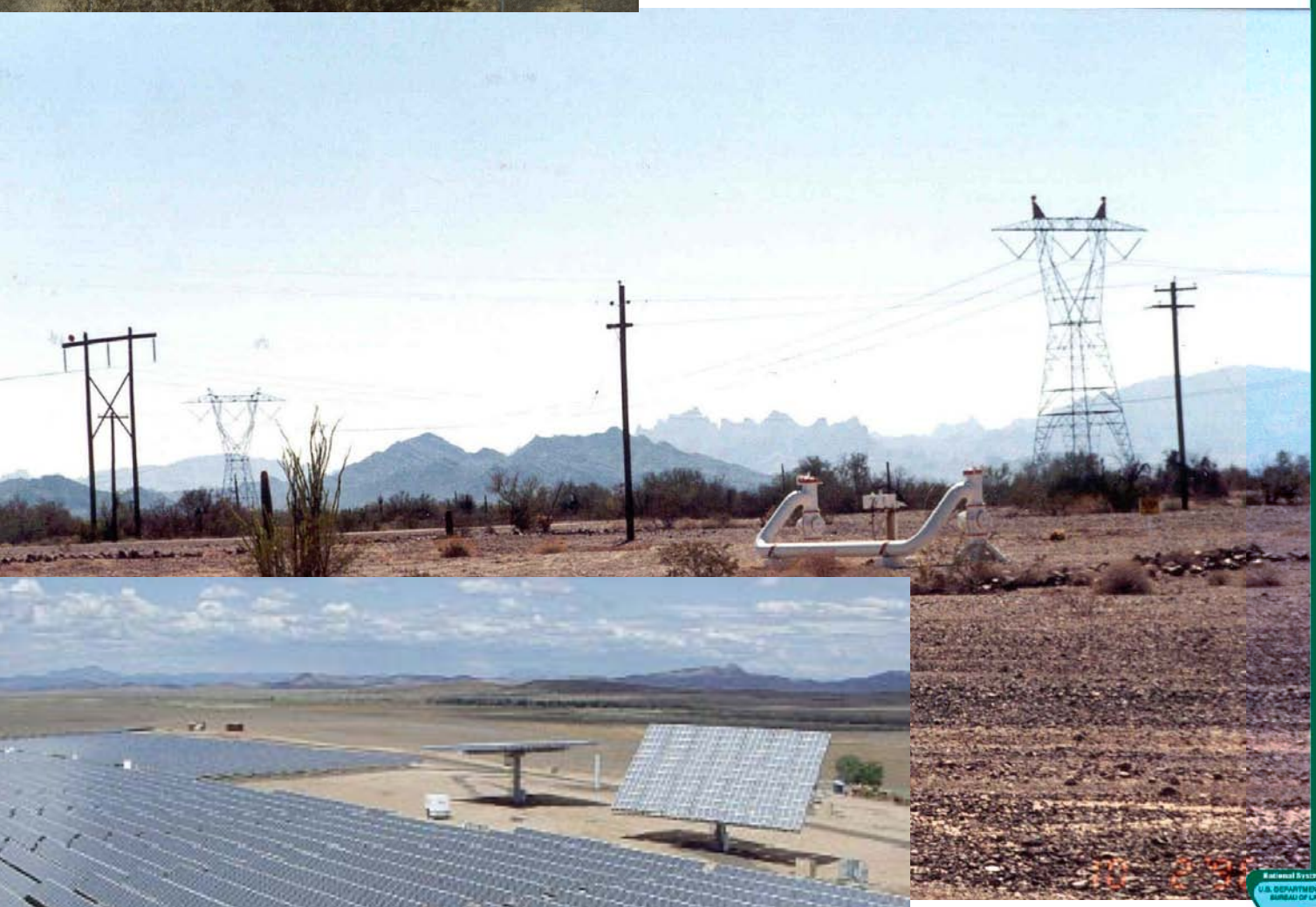
BLM

*Arizona Restoration Design Energy Project*

# Solar and Wind Energy Assessment of Nominated Sites

**February 2012**



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# ACRONYMS AND ABBREVIATIONS

| | Full Phrase |
|---|---|
| ACC | Arizona Corporation Commission |
| ADEQ | Arizona Department of Environmental Quality |
| AZGFD | Arizona Game and Fish Department |
| BLM | United States Department of the Interior, Bureau of Land Management |
| BOR | United States Department of the Interior, Bureau of Reclamation |
| CAP | Central Arizona Project |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CRA | Community Reinvestment Act |
| CSP | concentrating solar power |
| DNI | direct normal irradiance |
| DOE | US Department of Energy |
| EPA | US Environmental Protection Agency |
| FUP | Free Use Permit |
| GIS | geographical information system |
| GW | gigawatt |
| H.R. | House of Representatives |
| kV | kilovolt |
| kW | kilowatt |
| kWh | kilowatt hour |
| $m^2$ | square meter |
| mph | miles per hour |
| MW | megawatt |
| MWh | megawatt hour |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NREL | National Renewable Energy Laboratory |
| OHV | off-highway vehicle |
| PPA | power purchase agreement |
| PV | photovoltaic |
| RCRA | Resource Conservation and Recovery Act of 1976 |
| RDEP | Restoration Design Energy Project |
| REST | Renewable Energy Standard and Tariff |
| ROW | right-of-way |
| SRMA | Special Recreation Management Area |

## ACRONYMS AND ABBREVIATIONS *(continued)*

| | Full Phrase |
|---|---|
| SRP | Salt River Project |
| US | United States |
| USC | United States Code |
| VRM | Visual Resource Management |

# EXECUTIVE SUMMARY

## INTRODUCTION

On January 13, 2010, the United States (US) Department of the Interior, Bureau of Land Management (BLM) Arizona State Office launched the Restoration Design Energy Project (RDEP) in an effort "to identify sites and/or areas managed by the BLM that may be suitable for the development of renewable energy and to establish appropriate design criteria for such projects" (Federal Register, Volume 75, Number 8, page 1807).

As part of the RDEP, the BLM is exploring opportunities to sustainably reuse disturbed lands with renewable energy potential in order to meet the demand for renewable energy generation, and address remediation and restoration requirements for the sites. Various types of solar and wind energy technology can be considered viable options for renewable energy development on previously disturbed sites and areas with low resource conflicts. These technologies evaluated in this report include:

- Utility and distributed scale solar power technologies, including concentrating solar power (CSP) and photovoltaic (PV), and
- Wind, including utility and community scale.

Based on an extensive public outreach process, the BLM and public identified 64 previously disturbed sites on federal (including BLM-administered), state, municipal, and private lands that may potentially be suitable for renewable energy development. Site types include gravel pits, mine sites, landfills, isolated parcels that have been disturbed, marginal or impaired agricultural lands, abandoned unauthorized airstrips, and Central Arizona Project (CAP) right-of-ways (ROW). These 64 sites are not an exhaustive list, as there may be other disturbed lands in the state; however, they serve as a reasonable sample to understand the potential issues associated with reuse for renewable power on disturbed lands. Detailed *Nominated Site Profiles* that summarize existing

resources, contamination/remediation concerns, and solar and wind potential for each site are provided in **Section 7**, Nominated Site Profiles.

### Objective

This report evaluates the feasibility of the 64 previously disturbed sites in Arizona as sites for solar and wind energy technology. The objectives of this report are to:

- provide background information for the nominated sites, including solar and wind energy potential, environmental characteristics, potential remediation or restoration requirements; and
- based on site characteristics, assess the potential for solar and wind energy development on the nominated sites.

To assess the potential of each site, BLM developed a site-screening process that was used to evaluate the nominated sites for solar and wind energy development.

### Scope

This renewable resource assessment only analyzes the initial feasibility of redeveloping the 64 RDEP nominated sites with solar and wind energy development. Additionally, while Arizona has potential for rooftop solar and cogeneration of renewable energy along with conventional energy production facilities, the scope of this analysis is limited to on-the-ground CSP and PV solar energy technology (including utility and distributed scale), and utility and community wind energy technology.

## SITING RENEWABLE ENERGY ON PREVIOUSLY DISTURBED LANDS

The benefits of developing on disturbed lands, such as brownfields, landfills, mine sites, and marginal or impaired agricultural lands, are well established; however, siting renewable energy on these types of lands can be complicated. Developers need to consider the environmental laws and regulations at the federal, state, and local level.

A disturbed site's characteristics may present unique environmental considerations and need to be carefully examined during the planning stage.

- **Site contamination.** The severity of site contamination may limit redevelopment opportunities.
- **Environmental liability.** If leasing land, work with the owner to determine liability for issues that may arise during renewable energy construction, operation, and decommission.
- **Remediation.** Consider the types of remediation required and the technology required for remediation tasks.

Developers also need to contend with technical issues related to construction and operation of renewable energy technologies on these types of sites. Key technical considerations include:

- **Proximity to transmission.** If the electricity generated will be sent off-site, consider whether the site has adequate transmission interconnection opportunities.
- **System size.** How large will the onsite system be and will it conflict with the local electric grid's capacity?
- **Usable acreage.** How much of the site can be utilized for renewable energy development? Does slope, aspect, or structures obstruct the resource?
- **Surrounding land uses.** Developers should determine the surrounding land uses, including open space and conservation areas, and their compatibility with renewable energy development.

Some of the more notable advantages to developing on these sites include the following: infrastructure; terrain; property size; zoning; reciprocal interest; public and community relations; reduced liability and cleanup costs; and tax and financial incentives.

**Brownfields**

Cleaning up and reinvesting in brownfields increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and improves and protects the environment. Brownfields may offer several of the advantages listed above that can result in cost and time savings for the developer. However, certain site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on brownfields. For example, smaller sites may not support utility-scale wind development or certain solar energy technologies. Brownfields may also pose unique environmental considerations. Existing buildings or other obstructions can limit the placement of renewable energy infrastructure. If the site is classified by the US Environmental Protection Agency (EPA), renewable energy might conflict with the cleanup and investigation schedule. On-going remediation requirements may limit the type and location of solar and wind energy facilities.

**Landfills**

Landfills are also being identified as potential areas for solar and wind energy generation and may offer several of the advantages listed above. Some landfill site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, portions of the landfill may still be active and avoided during construction activities. Gas collection systems may require setbacks and other siting considerations. The search for a suitable site shouldn't be limited to closed landfills. Active landfills

where a portion of the site has been closed may also be acceptable for renewable energy development and landfill operators may be actively seeking a clean energy partnership.

### Mine Sites

Mine sites may also pose unique environmental considerations that may impose restrictions on the type and amount of renewable energy that can be developed on an active or closed mine site. For example, vertical cuts in the land can present a significant danger when in close proximity to structures or roads, and structures built above or below highwalls may be damaged by falling rock, and building near a highwall can also increase safety concerns. Other concerns include settlement, subsidence, landslides, and drainage.

### Marginal or Impaired Agricultural Lands

With continuing use of incentives to generate renewable energy, developers have also demonstrated a preference for marginal and impaired private lands, particularly agricultural parcels that may no longer be economically viable for agricultural production or where land is taken out of farm production for lack of water. They are often attracted to this farmland because of its proximity to existing electricity infrastructure such as transmission lines and substations. The degraded nature of the land may also make it less likely to have significant biological, environmental, or agricultural value that may make the land unsuitable for renewable energy development.

Technical feasibility of solar and wind developments on brownfields, landfills, mine sites, and marginal or impaired agricultural lands depends on compatibility of the solar or wind systems with the existing site components, including ongoing remediation, slope stability, settlement, foundation considerations, maintaining integrity of the cap system (landfills), and drainage.

## Solar and Wind Energy Technology and Development Considerations

### Solar Technologies

Solar radiation may be harnessed through various technologies and transformed to usable energy, such as heat and electricity. Two basic solar energy technologies that produce electrical power are CSP systems and PV systems. CSP technologies use mirrors to concentrate sunlight onto receivers that convert it to heat. The thermal energy is then used to drive a generator via steam turbine or heat engine to produce electricity. CSP technologies require cooling of the exhaust steam so that it condenses back into water before being heated again into steam. CSP technologies are the most suitable solar technologies for large utility-scale applications. The three main types of CSP technologies are linear concentrator, dish/engine, and power tower systems.

PV systems use solar cells consisting of semiconductor materials similar to those used in computer chips to capture the energy in sunlight and convert it directly into electricity. PV systems must be scaled over a very large area in order to be

effective for utility-scale applications. There are two types of PV systems in use today: flat-plate systems and concentrated PV systems.

### Wind Technologies

Wind turbines are available in a variety of sizes, and, subsequently, a variety of power ratings. Utility-scale wind turbines for land-based wind farms have rotor diameters ranging from 130 to about 395 feet, and towers that reach 130 to 425 feet high. Utility-scale turbines range in power rating from 100 kilowatt (kW) to as large as several megawatts (MWs). Larger turbines are grouped together into wind farms, which provide bulk power to a utility power grid. Wind power plants are modular, which means they consist of small individual modules (turbines), and, depending on electricity demand, can easily modify production capacity.

### Development Considerations

Solar and wind power generation depends on selecting a suitable site, including consideration of access roads and interconnections with the transmission grid. Many different factors determine whether a particular site warrants consideration for potential solar or wind power generation. Once a preliminary screening is completed, developers will want to conduct more detailed research before committing to project construction and operation. Steps to undertake may include resource surveys (e.g., rare plants, biological, or cultural surveys), soil studies, surface hydrology and wetlands mapping, and microsite meteorological testing. Developers will also want to calculate the cost necessary to construct access roads (if necessary) and consider any compatibility issues with surrounding land uses. Finally, power purchase agreements (PPA) and transmission grid interconnection are critical financial aspects of any project and will vary by location.

Overall, developers are looking for a site that can generate revenue. Developers look for areas where regulatory and funding programs are in place to encourage development of solar projects. Having these types of programs in place help expedite the process and can provide financial incentives to ensure the project is economically feasible. Other features developers look for include flat land, nearby transmission connections, older disturbed lands, and good solar potential. These factors ultimately determine the costs associated with development and their influence on a developers return on investment.

### Solar and Wind Market Trends

Annual US grid-connected PV installations doubled to 890 MW in 2010 compared with installations in 2009 (IREC 2011). The largest growth of grid-connected PV occurred in the utility sector. Although the number of utility PV installations remains small, the average system size is over 1.45 MW. The average size of grid-connected PV installations varies from state-to-state, depending on available incentives, interconnection standards, net metering regulations, solar resources, retail electricity rates, and other factors. In 2010

Arizona had 63.6 MW of grid-connected PV capacity installed, a 201 percent change from 2009 which saw 21.1 MW of capacity installed.

In 2010 the demand for CSP was insignificant. However, there are several very large projects currently under development in California and Arizona. There is greater uncertainty with the future growth of CSP technology in the US due to financing, permitting, water use, and environmental approvals because of the large land requirements for this type of technology.

The US wind power market slowed in 2010. Through 2010, Arizona had cumulative total of 128 MW of utility-scale wind power (AWEA 2011). Wind power installations in 2010 were similar in magnitude to those recorded in 2007; however they were just half those seen in 2009 and were 40 percent lower than in 2008. With federal incentives for wind energy in place through 2012, an improved project finance environment in 2010 and early 2011, and lower wind turbine and wind power pricing, modest growth in annual wind power capacity appears likely in 2011 relative to 2010.

## RDEP Solar and Wind Site Assessment

The general goal of the analysis is to provide a preliminary assessment of the overall potential for developing solar or wind energy on each of the nominated sites. As discussed below, several criteria were developed to inform the preliminary assessment.

### Solar Assessment

Each nominated site was given a weighted score on a scale of 0 (least development potential) to 100 (best development potential) based on slope of the terrain; solar resource availability; distance to existing transmission lines, interconnections, and roads; and the presence of sensitive resources and potentially incompatible land use designations. This analysis provides a first-level screening to identify areas that merit further scrutiny for solar or wind resource development. The solar energy analysis does not differentiate between CSP and PV technologies. However, because available technology currently requires a large land area to be commercially viable, sites less than 100 acres are noted in the site profiles (**Section 7**, Nominated Site Profiles) for their possible incompatibility with large-scale or central CSP projects.

#### *Results*

Utilizing the methodology outlined above, each site was given a score that corresponds to their potential for solar energy development.

**Table ES-1**, RDEP Nominated Sites Solar Screening Results, shows the scores for each nominated site.

**Table ES-1**
**RDEP Nominated Sites Solar Screening Results**

| Site Number | Site Name | Solar Screening Results | Site Number | Site Name | Solar Screening Results |
|---|---|---|---|---|---|
| 1 | 19th Street Landfill | **88.5** | 34 | La Osa Surface Disturbance | **88** |
| 2 | Belmont Mountain CAP | **88.5** | 35 | Litchfield Park Urban Parcel | **97** |
| 3 | Belmont Proposed Disposal | **82.5** | 36 | Little Harquahala CAP | **86** |
| 4 | Black Canyon City Landfill | **91** | 37 | Los Reales | **88.5** |
| 5 | Black Rock Gypsum Mine | **76.5** | 38 | Mobile Proposed Disposal | **91.5** |
| 6 | Bouse Hills CAP | **86.5** | 39 | Mokaac Gravel Pit | **88.5** |
| 7 | Brady Central CAP | **85** | 40 | Old Yuma County FUP | **91.5** |
| 8 | Brady Wash Pipeline | **74.5** | 41 | Page Landfill | **97** |
| 9 | Butler Valley | **88.5** | 42 | Prudence | **81** |
| 10 | Cave Creek 2 | **91** | 43 | Quartzite Area | **85.5** |
| 11 | Cave Creek Landfill | **88** | 44 | Red Gap Ranch | **100** |
| 12 | Chevron Vacant Land | **79.5** | 45 | Red Rocks CAP | **82.5** |
| 13 | Christmas Mine | **63** | 46 | Ryan | **94** |
| 14 | Copperstone Mine | **83** | 47 | Ryland | **85** |
| 15 | Cordes Lakes Hazmat | **62.5** | 48 | Saginaw Hill-Valhalla-Snyder Hill Mine & Quarry | **83** |
| 16 | Dateland Gravel Pit | **82** | 49 | Saginaw Hill | **92** |
| 17 | Detrital Wash | **91.5** | 50 | San Xavier Mine | **86** |
| 18 | Dogtown Mine | **85.5** | 51 | Silver Creek Landfill | **65.5** |
| 19 | Empire Farms | **94** | 52 | Silverbell | **91** |
| 20 | Florence-Price Dump | **85** | 53 | Snowflake Mine | **71** |
| 21 | Foothills Proposed Disposal | **78.5** | 54 | Snyder Hill Mine | **89** |
| 22 | Forepaugh Airport | **94** | 55 | Sonoita Landfill | **85.5** |
| 23 | Fredonia Landfill | **86** | 56 | St. Mary's | **91** |
| 24 | Fredonia OHV Area | **73** | 57 | Tombstone Landfill | **83.5** |
| 25 | Granite Hill Landing Strip | **85.5** | 58 | Torrez-Brant | **97** |
| 26 | Harcuvar Substation | **91** | 59 | Tumamoc | **73.5** |
| 27 | Harquahala CAP | **100** | 60 | Twin Peaks-Sandrio CAP | **88.5** |
| 28 | Harrison Road | **62.5** | 61 | Valhalla | **92** |
| 29 | Hartman Wash Mine | **57** | 62 | Vincent Mullins | **73** |
| 30 | Hassayampa Landfill | **89** | 63 | White Sage Gravel Pits | **82** |
| 31 | Hassayampa CAP | **94.5** | 64 | Wildcat Hill | **94.5** |
| 32 | Irvington | **78** | | | |
| 33 | Jones Private Property | **85** | | | |

## Wind Assessment

A preliminary site assessment has been carried out by BLM to evaluate the suitability of community and utility wind technologies on the 64 nominated sites. The assessment was based on general topographic and property size suitability, wind potential rating, maximum potential MW output, distribution lines accessible for interconnecting to the grid, distance to different types of load centers, and potential sensitive resources issues. The general goal of the analysis is to provide a preliminary assessment of the overall potential for developing community or utility-scale wind energy stations on each of the 64 nominated sites.

The methodologies for community and utility wind differ in that distance to roads and transmission interconnects is considered more important for community wind development, which is typically sited close to demand centers.

### *Results*

Only three of the nominated sites have any wind resource potential: Brady Wash Pipeline (a 6-acre portion), Red Gap Ranch (a 1,700-acre portion), and Silver Creek Landfill (an 11-acre portion) are all rated "Fair." The small number of suitable acres at Brady Wash Pipeline and Silver Creek Landfill likely eliminate them from consideration for utility wind. Under the scoring system for community wind, those sites receive 39.5 and 37.5 points, respectively. Red Gap Ranch receives 60 points for community wind and 76 points for utility wind. No other nominated sites are considered ideal for wind energy development because they lack an adequate wind resource class.

# SECTION 1
# INTRODUCTION

## 1.1 INTRODUCTION

On January 13, 2010, the United States (US) Department of the Interior, Bureau of Land Management (BLM) Arizona State Office launched the Restoration Design Energy Project (RDEP) in an effort "to identify sites and/or areas managed by the BLM that may be suitable for the development of renewable energy and to establish appropriate design criteria for such projects" (Federal Register, Volume 75, Number 8, page 1807).

**Utility:** Utility-scale energy plants generate a large amount of electricity that is transmitted from one location (the energy plant) to many users through the transmission grid.

**Distributed:** Energy provided by small, modular power generators (typically ranging in capacity from a few kilowatts to 50 megawatts) located at or near customer demand.

**Community:** Projects are locally owned by public or private entities that utilize wind energy, and may be used for on-site power or to generate wholesale power for sale, usually on a commercial-scale greater than 100 kilowatt.

As part of the RDEP, the BLM is exploring opportunities to sustainably reuse disturbed lands with renewable energy potential in order to meet the demand for renewable energy generation, and address remediation and restoration requirements for the sites. Various types of solar and wind energy technology can be considered viable options for renewable energy development on previously disturbed sites and areas with low resource conflicts. These technologies evaluated in this report include:

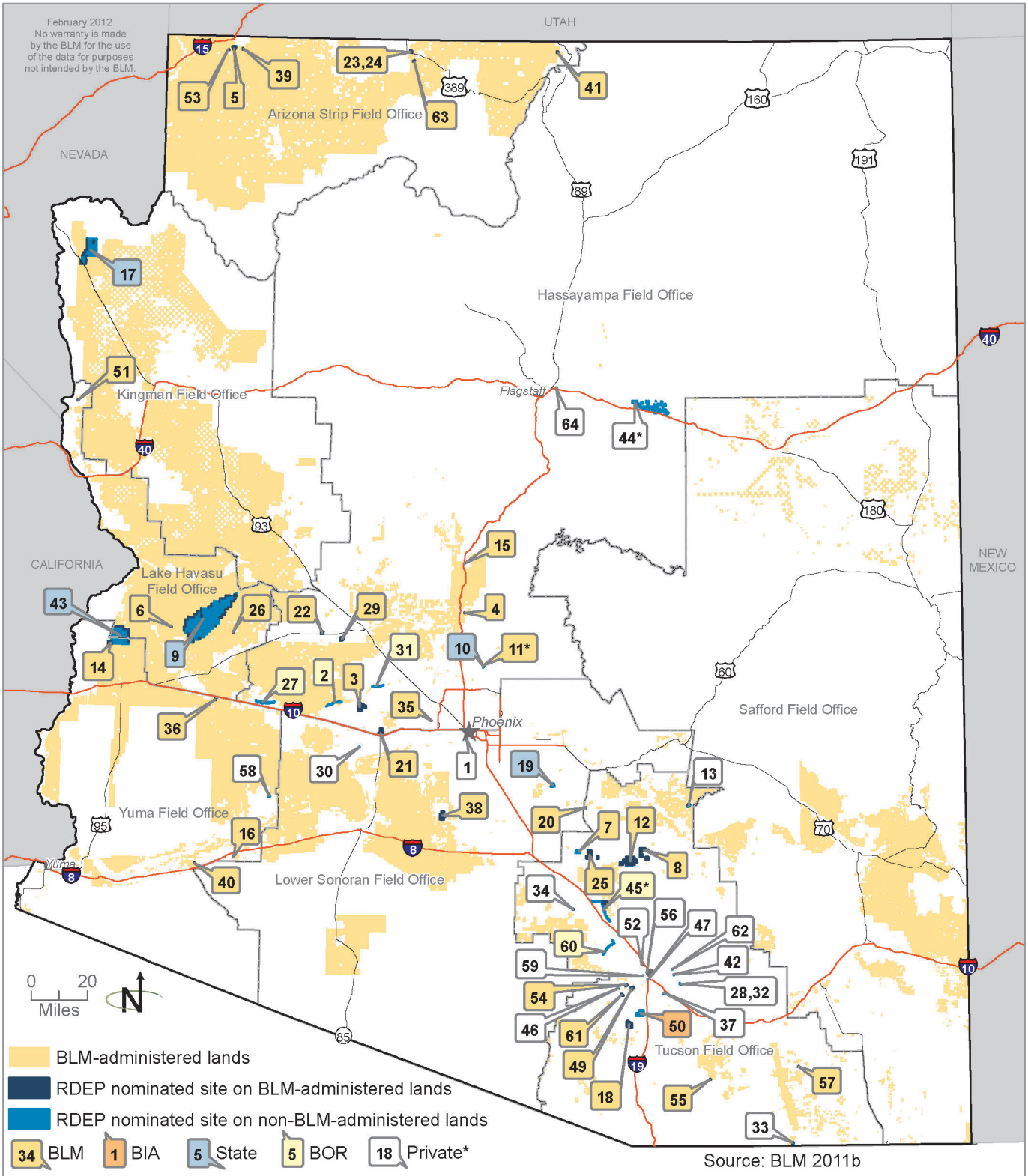
- Utility and distributed scale solar power technologies, including concentrating solar power (CSP) and photovoltaic (PV), and
- Wind, including utility and community scale.

Descriptions of solar and wind energy technologies are discussed in **Section 3**, Solar and Wind Energy Technology and Development Considerations.

Based on an extensive public outreach process, the BLM and public identified 64 previously disturbed sites on federal (including BLM-administered), state, municipal, and private lands (see **Figure 1-1**, RDEP Nominated Sites and **Table 1-1**, RDEP Nominated Site Summaries) that may potentially be suitable for renewable energy development. Site types include gravel pits, mine sites, landfills, isolated parcels that have been disturbed, marginal or impaired

## RDEP Nominated Sites

Based on an extensive public outreach process, the BLM and public identified 64 suitable previously disturbed sites on BLM-administered, state, municipal, private and other federal lands.




Please see Table 1-1 RDEP Nominated Site Summaries, for RDEP nominated sites' names corresponding to the numbers on this figure. Site 48 (not shown on map) is comprised of sites 49, 54, and 61. *Sites have multiple ownerships, majority ownership is displayed. The number of sites per landownership type is displayed.

Figure 1-1

**Table 1-1**
**RDEP Nominated Site Summaries**

| Site Number | Site Name | County | Land Owner | Acres | Site Type |
|---|---|---|---|---|---|
| 1 | 19th Street Landfill | Maricopa | Private | 191 | Landfill |
| 2 | Belmont Mountain CAP | Maricopa | BOR | 841 | CAP right-of-way |
| 3 | Belmont Proposed Disposal | Maricopa | BLM | 3,174 | Isolated fragment |
| 4 | Black Canyon City Landfill | Yavapai | BLM | 25 | Landfill |
| 5 | Black Rock Gypsum Mine | La Paz | BLM | 679 | Mine |
| 6 | Bouse Hills CAP | La Paz | BLM | 120 | CAP right-of-way |
| 7 | Brady Central CAP | Multiple | BLM | 1,023 | CAP right-of-way |
| 8 | Brady Wash Pipeline | Pinal | BLM | 3,240 | Utility corridor |
| 9 | Butler Valley | La Paz | State | 83,013 | Agricultural |
| 10 | Cave Creek 2 | Maricopa | State | 68 | Landfill |
| 11 | Cave Creek Landfill | Maricopa | BLM/ State | 42 | Landfill |
| 12 | Chevron Vacant Land | Pinal | BLM | 7,812 | Vacant |
| 13 | Christmas Mine | Gila | Private | 496 | Mine |
| 14 | Copperstone Mine | La Paz | BLM | 929 | Mine |
| 15 | Cordes Lakes Hazmat | Yavapai | BLM | 14 | Hazardous materials site |
| 16 | Dateland Gravel Pit | Yuma | BLM | 64 | Mineral material |
| 17 | Detrital Wash | Mohave | State | 17,695 | Detrital wash |
| 18 | Dogtown Mine | Pima | BLM | 2,080 | Mine |
| 19 | Empire Farms | Pinal | State | 682 | Agricultural |
| 20 | Florence-Price Dump | Pinal | BLM | 85 | Landfill |
| 21 | Foothills Proposed Disposal | Maricopa | BLM | 1,355 | Isolated fragments |
| 22 | Forepaugh Airport | Maricopa | BLM | 635 | Disturbed area |
| 23 | Fredonia Landfill | Coconino | BLM | 21 | Landfill |
| 24 | Fredonia OHV Area | Coconino | BLM | 348 | Recreation area |
| 25 | Granite Hill Landing Strip | Pinal | BLM | 2,656 | Previous landing strip |
| 26 | Harcuvar Substation | La Paz | BLM | 59 | Utilities |
| 27 | Harquahala CAP | La Paz and Maricopa | BOR | 1,910 | CAP right-of-way |
| 28 | Harrison Road | Pima | Private/ State | 65 | Landfill |
| 29 | Hartman Wash Mine | Maricopa | BLM | 678 | Mine |
| 30 | Hassayampa Landfill | Maricopa | Private | 9 | Landfill |
| 31 | Hassayampa CAP | Maricopa | BOR | 723 | CAP right-of-way |
| 32 | Irvington | Pima | Private/ State | 13 | Landfill |
| 33 | Jones Private Property | Cochise | Private | 156 | Agricultural |

**Table 1-1**
**RDEP Nominated Site Summaries**

| Site Number | Site Name | County | Land Owner | Acres | Site Type |
|---|---|---|---|---|---|
| 34 | La Osa Surface Disturbance | Pinal | Private | 41 | Disturbed area |
| 35 | Litchfield Park Urban Parcel | Maricopa | BLM | 41 | Disturbed area |
| 36 | Little Harquahala CAP | La Paz | BLM | 159 | CAP right-of-way |
| 37 | Los Reales | Pima | Private | 248 | Landfill |
| 38 | Mobile Proposed Disposal | Maricopa | BLM | 2,843 | Isolated fragments |
| 39 | Mokaac Gravel Pit | Mohave | BLM | 80 | Mineral material |
| 40 | Old Yuma County FUP | Yuma | BLM | 27 | Mineral material |
| 41 | Page Landfill | Coconino | BLM | 160 | Landfill |
| 42 | Prudence | Pima | Private | 9 | Landfill |
| 43 | Quartzite Area | La Paz | State | 22,131 | Agricultural |
| 44 | Red Gap Ranch | Coconino | State/ Private | 7,984 | Agricultural |
| 45 | Red Rocks CAP | Pinal and Pima | BOR/ BLM | 2,213 | CAP right-of-way |
| 46 | Ryan | Pima | Private | 16 | Landfill |
| 47 | Ryland | Pima | Private | 27 | Landfill |
| 48 | Saginaw Hill-Valhalla-Snyder Mine & Quarry | Pima | BLM | 997 | Mine |
| 49 | Saginaw Hill (1/3 of SVS Mine & Quarry) | Pima | BLM | 332 | Mine |
| 50 | San Xavier Mine | Pima | Tribal | 2,573 | Mine |
| 51 | Silver Creek Landfill | Mohave | BLM | 50 | Landfill |
| 52 | Silverbell | Pima | Private | 36 | Landfill |
| 53 | Snowflake Mine | Mohave | BLM | 24 | Mine |
| 54 | Snyder Hill Mine (1/3 of SVS Mine & Quarry) | Pima | BLM | 332 | Mineral material |
| 55 | Sonoita Landfill | Santa Cruz | BLM | 39 | Landfill |
| 56 | St. Mary's | Pima | Private | 10 | Landfill |
| 57 | Tombstone Landfill | Cochise | BLM | 43 | Landfill |
| 58 | Torrez-Brant | Maricopa | Private | 408 | Agricultural |
| 59 | Tumamoc | Pima | Private | 21 | Landfill |
| 60 | Twin Peaks-Sandrio CAP | Pima | BOR | 888 | CAP right-of-way |
| 61 | Valhalla (1/3 of SVS Mine & Quarry) | Pima | BLM | 332 | Disturbed area |
| 62 | Vincent Mullins | Pima | Private | 32 | Landfill |
| 63 | White Sage Gravel Pits | Coconino | BLM | 61 | Mineral material |
| 64 | Wildcat Hill | Coconino | Private | 75 | Brownfield |

agricultural lands, abandoned unauthorized airstrips, and Central Arizona Project (CAP) right-of-ways (ROW). These 64 sites are not an exhaustive list, as there may be other disturbed lands in the state; however, they serve as a reasonable sample to understand the potential issues associated with reuse for renewable power on disturbed lands.

Detailed *Nominated Site Profiles* for each site are provided in **Section 7**, Nominated Site Profiles, and include the following information:

- Location facts, including site size, location, previous land use, adjacent land use(s), and surface and mineral ownership;
- Site characteristics, including solar and wind potential rating, estimated solar and wind generation capacity, developable acres, distance to graded roads, distance to transmission interconnections, and groundwater;
- Select environmental factors, including those for wildlife, vegetation, sensitive or listed species, wetlands, hydrology, special designations, land use, etc.;
- Site opportunities and constraints;
- Suggested remediation and restoration requirements; and
- Summary describing the overall potential of the site for renewable energy development.

To facilitate site nominations, the BLM launched a Web site with RDEP information and nomination forms. During scoping, the BLM received 42 site nominations from local, state, and federal agencies, private companies, and the public. The BLM has continued to receive nominations, resulting in a total of 64 nominated sites.

These profiles are intended to provide a preliminary indication of whether or not a particular site is suitable for solar or wind energy development. The information contained within this site summary has been created to give an overview of each site and is not a guarantee of a site's suitability for energy development. Developers should consult with appropriate government agencies and undertake further research before making a final determination on a site's suitability for their project(s).

## 1.2 OBJECTIVE

This report evaluates the feasibility of the 64 previously disturbed sites in Arizona as sites for solar and wind energy technology. The objectives of this report are to:

- provide background information for the nominated sites, including solar and wind energy potential, environmental characteristics, potential remediation or restoration requirements; and
- based on site characteristics, assess the potential for solar and wind energy development on the nominated sites.

To assess the potential of each site, BLM developed a site-screening process that was used to evaluate the nominated sites for solar and wind energy

development. For the purposes of this analysis, the potential for solar and wind energy development can be determined by the area of developable land; solar and wind resource availability; distance to transmission lines (interconnections), load centers and roads; sensitive resources; and land management status.

## 1.3 SCOPE

Although over 52 percent of the land in Arizona supports adequate solar resources and approximately two percent has adequate wind resources, this renewable resource assessment only analyzes the initial feasibility of redeveloping the 64 RDEP nominated sites with solar and wind energy development. Additionally, while Arizona has potential for rooftop solar and cogeneration of renewable energy along with conventional energy production facilities, the scope of this analysis is limited to on-the-ground CSP and PV solar energy technology (including utility and distributed scale), and utility and community wind energy technology.

There are many issues that must be addressed when considering renewable energy as a redevelopment option, and an appropriate resource siting is only one. Other issues not considered in this report include policies, tax incentives, financing, and technology changes. Further technical and financial analysis of the nominated sites will be needed to determine the optimal sites for development of specific types of solar and wind energy technology. The assessment was conducted using geographical information system (GIS) analysis (see **Section 6**, References and Data Sets for GIS Screening).

## 1.4 REPORT ORGANIZATION

Following this introductory section, Section 2 provides background information for considering solar and wind energy development on brownfields, landfills, and mine sites. An overview of solar and wind technology and development is provided in Section 3. Sections 4 and 5 present the solar and wind site assessments. References and GIS data sets are provided in Section 6. The nominated site profiles are included in Section 7.

# SECTION 2
# SITING RENEWABLE ENERGY ON PREVIOUSLY DISTURBED LANDS

## 2.1 BACKGROUND

Renewable energy development on previously disturbed lands is relatively new and growing in acceptance and popularity, and is often considered to be sustainable development. Sustainable development has numerous definitions depending on usage, but most sources cite the 1987 United Nations World Commission on Environment and Development report "Our Common Future" definition of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In this context of developing renewable energy, sustainable development hinges on balancing developing energy to meet a community's needs while preserving undisturbed lands.

US Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response states the reasons for pursing renewable energy projects on disturbed lands may include (EPA 2005a):

- Taking stress off undeveloped lands for construction of new energy facilities;
- Using existing transmission capacity and infrastructure of formerly developed lands;
- Providing economically viable reuse to sites with significant cleanup costs or low real estate development demand; and
- Spurring needed investment in both urban and rural communities, and creating jobs.

This section identifies issues and concerns that should be addressed by communities, agencies, and developers interested in developing renewable energy on previously disturbed lands. The information presented will help define

key aspects that need to be addressed in order to successfully site renewable energy development on previously disturbed lands. However, interested parties will need to further investigate the site prior to making a final determination on a site's suitability for their project(s). The section begins with highlighting common regulatory requirements and factors to be considered regardless of the type of disturbed land sites, followed by specific information related to reusing brownfields, landfills, mine sites, and marginal or impaired agricultural lands for renewable energy development.

## 2.2 REGULATIONS AND RESOURCES

The benefits of developing on disturbed lands are well established; however, siting renewable energy on disturbed lands can be complicated. Developers need to consider the environmental laws and regulations at the federal, state, and local level. The following is a condensed summary representative of regulations involved in developing on previously disturbed land. A sampling of resources available for developing on previously disturbed sites is also provided.

### 2.2.1 Federal Regulations

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund.** This federal act (42. United States Code [USC] 9601–9675) created a tax to fund a federal cleanup program for contaminated sites, including sites that fall under EPA's National Priorities List.
- **Small Business Liability Relief and Brownfields Revitalization Act.** This federal law (Public Law 107-118 [House of Representatives (H.R.) 2869]) provides certain relief for small businesses from liability under CERCLA, and to promote the cleanup and reuse of brownfields (including landfills and mine sites) to provide financial assistance for revitalization, to enhance state response programs, and for other purposes.
- **Resource Conservation and Recovery Act (RCRA).** This federal act (42 USC Section 6901 et seq.) gives EPA the authority to regulate the treatment of hazardous waste from manufacturing to disposal. State and local governments are responsible for the implementation of RCRA, including the Arizona Department of Environmental Quality (ADEQ) Waste Programs Division.
- **Community Reinvestment Act (CRA).** By requiring banks and other lenders to make capital available in low-income zones, this federal act (12 USC 2901) encourages development in areas likely to include brownfields. The EPA provides incentives for brownfield redevelopment through the CRA.
- **National Environmental Policy Act (NEPA).** Compliance with the NEPA is required for any project with a federal nexus, such as

construction on federal land, transmission line siting on federal land, federal funding (e.g., US Department of Energy [DOE] Loan Guarantee Program), or interconnection with the federal grid (e.g., Western Area Power Administration).

- **Federal Permits.** Depending on the site and project characteristics, these can include consultation and approval from the National Pollutant Discharge Elimination System, Federal Aviation Administration, US Fish and Wildlife Service, US Army Corps of Engineers, and others. These agencies will often advise developers on common design features, mitigation measures, and/or best management practices necessary to obtain required permits.
- **Surface Mining Control and Reclamation Act.** This federal act (30 USC Sections 1201-1328) establishes a program for regulating surface coal mining and reclamation activities. The act creates an Abandoned Mine Reclamation Fund for use in reclaiming and restoring land and water resources adversely affected by coal mining practices.

### 2.2.2 State and Local Regulations

- **State Permits.** Arizona agencies may require transmission routing permits, Arizona Corporation Commission (ACC) approval, resource surveys, or other permits. State agency contacts can assist developers with questions and identification of potential site constraints early in the process.
- **Land Use Regulations.** Local zoning requirements and other land use regulations must be compatible to renewable energy development and site reuse. Many land use policies and regulations currently do not address solar and wind power generation as a land use separate from other major utility facilities (e.g. power generating plants, substations, refuse collection, transfer, and disposal facilities) which are allowed in most zoning districts with a special use permit. Solar developers prefer clearly documented policies, requirements, and standards that reduce the potential for surprises in the entitlement process.

### 2.2.3 Resources

- **Brownfields National Partnership Action Agenda.** Coordinated by the EPA, this program outlines federal efforts to encourage private and state and local government redevelopment of brownfield sites (EPA 2002).
- **Brownfields Redevelopment Toolbox.** ADEQ developed this Toolbox to explain the brownfields process and to help guide redevelopment of these sites from start-to-finish. The Toolbox

identifies five steps in the brownfields renewal process (ADEQ 2010).

- **The Abandoned Mine Site Characterization and Cleanup Handbook.** While not official policy, this comprehensive resource, published by the EPA in 2000, draws on decades of experience to guide project managers through the reclamation of abandoned mines (EPA 2000).
- **Mine Site Cleanup for Brownfields Redevelopment: A Three-Part Primer.** Provides information about the cleanup aspects of mine site redevelopment, including new and innovative approaches to more efficiently characterize and clean up those sites. The use of these approaches to streamline characterization and remediation of mine sites offers the potential for redevelopment at a lower cost and within a shorter timeframe (EPA 2005b).

## 2.3 SITE CONTAMINATION, LIABILITY AND REMEDIATION

A site's characteristics may present unique environmental considerations and need to be carefully examined during the planning stage.

- **Site contamination.** The severity of site contamination may limit redevelopment opportunities.
- **Environmental liability.** If leasing land, work with the owner to determine liability for issues that may arise during renewable energy construction, operation, and decommission.
- **Remediation.** Consider the types of remediation required and the technology required for remediation tasks.

The passage of CERCLA (the Superfund Act) provided provisions to protect landowners from site contamination liability issues that were not caused by them. The due diligence process that evolved out of the liability concerns lead to the passage of the Small Business Liability Relief and Brownfields Revitalization Act. This act created various liability assurances for those who acquire contaminated properties. The act defines the steps one must take to conduct "All Appropriate Inquiry" (due diligence) prior to purchase of a potentially contaminated site, dictates what type of professionals may perform the due diligence, and provides grant funding to perform cleanups. Under the act, Phase I studies must be conducted to meet the criteria of "All Appropriate Inquiry" and establish a buyer as a Bona Fide Prospective Purchaser.

Being a Bona Fide Prospective Purchaser provides release from liability for existing environmental problems at the time of purchase (as long as the new owner doesn't make the pollution situation worse and takes immediate steps to remediate). If a landowner follows the steps set forth in statute the liability exposure is quantified and capped, providing a higher degree of liability protection and certainty to the redevelopment process.

The EPA has prepared two documents addressing liability concerns with contaminated sites. "Revitalizing Contaminated Sites: Addressing Liability Concerns (The Revitalization Handbook)" addresses environmental cleanup liability risks associated with the revitalization of contaminated property or sites (EPA 2011a). The "Siting Renewable Energy on Contaminated Properties: Addressing Liability Concerns" fact sheet provides answers to some common questions that developers of renewable energy projects on contaminated properties may have regarding potential liability for cleaning up contaminated properties. It also includes a Reference Section listing key EPA documents and Web sites, and endnotes citing specific provisions discussed in the fact sheet that provide additional information.

Remediation is necessary when contamination exceeds a standard or poses an unacceptable risk to public health and the environment. Often remediation can be done as part of the development plan. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. It has been found that many contaminants degrade naturally, thereby limiting the scope of cleanup. Removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

In many instances the mere presence of contamination does not always justify cleanup. It is the exposure or potential exposure of populations to unsafe levels of contamination that triggers a cleanup. It may be that the contamination does not pose a threat to public health and the environment within the proposed redevelopment scheme.

Groundwater cleanup criteria usually rely on a maximum contaminant level. The remediation plan may propose a risk-based closure for a specific use. Risk-based closure means that contamination may be left on site. For instance, cleanup for solar and wind energy use may allow for a higher contaminant level than if the site were to be used for residential construction. Similarly, a risk-based closure may entail eliminating exposure pathways, i.e., capping the soil so there is no human contact.

Environmental covenants may be needed to notify future parties about persistent contamination that may be left in place under a risk-based closure. This is a method of managing the site to prevent exposure to future site users. For instance, industrial cleanup standards are not quite clean enough for residential use; the environmental covenant will notify future residential developers that additional cleanup needs to be performed. If waste is consolidated in an onsite location and capped, an environmental covenant would notify future property owners not to dig in that location, or to have a plan to deal with the buried waste.

***Lessons Learned***

The development of a 40-acre solar farm at the Aerojet General Corporation Superfund site in Sacramento, California is an example of successful renewable energy projects and green remediation at contaminated lands. Reuse of the Aerojet General Corporation Superfund site provided a range of broad lessons learned that can help guide similar projects at contaminated lands in Arizona (EPA 2010).

1. EPA works with potentially responsible parties and other stakeholders to support green remediation and reuse projects like renewable energy development that are compatible with site cleanups. EPA places a high priority on green remediation and the development of renewable energy opportunities as part of the reuse of contaminated lands. At the Aerojet General Corporation site, EPA's coordination with Aerojet enabled the siting of the facility in an appropriate location and with an appropriate design that ensured flexibility if future investigation and remediation is necessary.
2. While EPA provides tools and resources to support Superfund reuse, communities and public and private sector organizations make it happen. EPA relies on engaged community stakeholders to bring their future land use goals and priorities to the table so that this information can be incorporated as part of the remedial process, linking cleanup and redevelopment. Aerojet shared its solar energy plans and worked cooperatively with EPA. When possible, future use plans should be shared with EPA as early in the remedial process as is feasible.
3. The Superfund remedial process can provide information to fulfill environmental permitting and other regulatory requirements for renewable energy projects like solar farms. Superfund sites are among the most comprehensively documented and evaluated areas of land. Aerojet relied on detailed site investigation information from the Superfund process to address environmental permitting requirements for the site as part of its larger real estate development plans, several years before the solar farm was even under consideration. At most sites, a completed remedial investigation/feasibility study or a draft proposed plan will provide site owners and prospective purchasers with extensive site information.

Specific factors that contributed to the Aerojet project's success include:

- Aerojet energetically pursued the development of the solar farm to help power the site's ground water remediation program, motivated by economic and environmental considerations to put in place the requisite resources, partnerships and expertise.

- Aerojet worked with private and public sector partners to develop a project approach that addressed liability concerns.
- EPA and state agencies were engaged partners with thorough knowledge of the biology, geology and chemistry of the location and they supported Aerojet's green remediation goals in the context of the site's cleanup.
- EPA had selected a remedy that would be consistent with the property's reasonably anticipated future land uses.

### 2.3.1 Siting Factors

Developers also need to contend with technical issues related to construction and operation of renewable energy technologies on these types of sites. Key technical considerations include:

- **Proximity to transmission.** If the electricity generated will be sent off-site, consider whether the site has adequate transmission interconnection opportunities.
- **System size.** How large will the onsite system be and will it conflict with the local electric grid's capacity?
- **Usable acreage.** How much of the site can be utilized for renewable energy development? Does slope, aspect, or structures obstruct the resource?
- **Surrounding land uses.** Developers should determine the surrounding land uses, including open space and conservation areas, and their compatibility with renewable energy development.

**Section 3.3**, Solar and Wind Development Considerations, provides a detailed discussion of these technical issues.

## 2.4 BROWNFIELDS

EPA defines the term "brownfield site" as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (Public Law 107-118 (H.R. 2869). Examples of Brownfields include:

- Landfills or dump sites
- Abandoned facilities
- Dry cleaning facilities
- Old gas stations
- Mine-scarred land
- Auto repair shops

Cleaning up and reinvesting in these properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment. Brownfields may offer several advantages that can result in cost and time savings for the developer. Some of the more notable advantages include the following:

- **Infrastructure.** Many brownfields have existing utility infrastructure on site or nearby. Given their previous use as commercial or industrial property, brownfields are often in close proximity to a road network suitable for transporting construction equipment.
- **Terrain.** The flat topography of most brownfields makes them suitable for solar or wind development.
- **Property size.** Brownfields vary tremendously in size, making it easy to tailor a renewable energy project to property's boundaries. In addition, contaminated sites may offer certain purchase or lease incentives unavailable on greenfield sites. Coupled with low competing real estate demand, the purchase or lease of brownfields can lower project costs considerably.
- **Zoning.** Brownfields are often located on lands zoned for commercial or industrial uses. In many cases, there is often no time-consuming rezoning process and adjacent landowners may not object to clean energy development of these sites for solar or wind energy.
- **Reciprocal interest.** Owners of brownfields may be looking for income opportunities and the liability relief that may accompany redevelopment.
- **Public and community relations.** Developers considering brownfield sites may receive support or an expedited permitting process from communities eager to reuse a brownfield site.
- **Reduced liability and cleanup costs.** Renewable energy development may require less intensive cleanup efforts than other potential reuses of brownfields. In addition, developers may be shielded from liability arising from existing on-site contamination.
- **Tax and financial incentives.** Municipalities may offer tax benefits to developers who agree to remediate and reuse a brownfield site. The ADEQ Brownfields Assistance Program awards grants to qualifying redevelopment projects (ADEQ 2010).

### 2.4.1 Technical Aspects

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on brownfields. For example, smaller

sites may not support utility-scale wind development or certain solar energy technologies.

Brownfields may also pose unique environmental considerations. Existing buildings or other obstructions can limit the placement of renewable energy infrastructure. If the site is classified as a brownfield by the EPA, renewable energy might conflict with the cleanup and investigation schedule. On-going remediation requirements may limit the type and location of solar and wind energy facilities.

### 2.4.2 Select Project Profiles

The following examples illustrate siting solar and wind energy facilities on brownfield sites.

**Exelon City Solar in Chicago, Illinois.** Situated on 41 acres of former industrial "brownfield" property that has been vacant for more than 30 years, the site is now remediated and restored to productive use. PV panels at Exleon City Solar now produce 10 megawatts (MW). The project came online in 2010 (Exelon 2011). Some key aspects related to development include:

- Site work began in July 2009, with Exelon performing considerable work to prepare the site for a PV plant. The site was cleared, basements and cisterns were filled, and barrels of hazardous materials were recovered and removed. As a final step, the ground was paved and 7,300 steel piers were driven into the ground.
- Undocumented underground storage tanks were located during the cleanup process and had to be removed and built around.

**Casper Wind Power Project in Casper, Wyoming.** Chevron is using 11 turbines on part of a former petroleum refinery to produce 16.5 MW of wind energy (Chevron 2011a). Some key aspects related to developing on brownfields include:

- Designated RCRA site; refinery produced motor fuels and asphalt.
- Risk-based soil remediation was contingent on reuse.
- Chevron investigated the site extensively and continues to fulfill their obligation to remediate site.

**Bethlehem Steel Winds Project in Lackawanna, New York.** A 30-acre former steel mill is now home to eight turbines with a 20 MW capacity (EPA 2011b). Some key aspects related to development include:

- Project location is a Superfund site contaminated with heavy metals and has mine acid drainage.

- Much of the construction could occur without excavating the contaminated soil.
- Windmill foundations, service roads, and green space cover the contamination.

**New Rifle Mill Site in Rifle, Colorado.** A 2.3 MW PV system now operates on 12 acres of contaminated land that had limited development potential for other projects (EPA 2011c). Some key aspects related to development include:

- Project location is a DOE Uranium Mine Tailings Remediation Control Act site.
- DOE performed the cleanup of surface and ground water contamination at the site.

**Philadelphia Naval Yard in Philadelphia, Pennsylvania.** A 1.5 MW PV system is expected to come online in 2011 at this former naval yard (EPA 2011d). Some key aspects related to development include:

- Project is a US Department of Defense Base Realignment and Closure project. Site is contaminated with heavy metals.
- Most of site required some form of cleanup (e.g., soil remediation and removal of underground storage tanks).
- Cleanup actions included soil remediation, groundwater monitoring, and a soil and vegetative cap.

## 2.5 LANDFILLS

In recent years, with the increasing interest in renewable energy sources, closed landfills are being identified as potential areas for solar energy generation. Closed landfills may offer several advantages, including the following:

- **Infrastructure.** Many landfills have existing utility infrastructure on site and given their proximity to urban centers, transmission interconnects may be close by. Landfills also depend on a road network capable of supporting large construction and maintenance vehicles, which can often be reused for energy project construction, operation, and maintenance.
- **Terrain.** The flat or gently sloping topography of landfills make them suitable for solar or wind development.
- **Land acquisition.** Developers can avoid a complicated acquisition process because landfills often have one or only a few owners. In addition, contaminated sites may offer certain purchase or lease incentives. Coupled with low competing real estate demand, the purchase or lease of landfills can lower project costs considerably.

- **Industrial zoning.** Renewable energy development is often considered compatible with surrounding land uses if sited on a former landfill. There is often no time-consuming rezoning process and adjacent landowners may not object to clean energy development of these sites for solar or wind energy.
- **Reciprocal interest.** Owners of closed landfills may be looking for alternative forms of income and the liability relief that may accompany redevelopment.
- **Public and community relations.** Developers considering contaminated sites may receive support or an expedited permitting process from communities eager to repurpose a closed landfill.
- **Reduced liability programs.** Where cleanup is necessary, EPA and most state voluntary cleanup programs offer mechanisms for limiting liability.

### 2.5.1 Technical Aspects

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, portions of the landfill may still be active and avoided during construction activities. Gas collection systems may require setbacks and other siting considerations. The search for a suitable site shouldn't be limited to closed landfills. Active landfills where a portion of the site has been closed may also be acceptable for renewable energy development and landfill operators may be actively seeking a clean energy partnership.

Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

***Slope Stability***

For landfills with steep slopes, re-grading and use of additional top soil can help achieve suitable slopes capable of supporting structure placement. In general steep slopes demand strong foundations (i.e., poured concrete or pre-cast concrete footings) with light weight components. Light weight solar components of appropriate mechanical loading rates with strong foundation is preferred at sloped surfaces, rather than the heavy structures associated with large solar components or wind turbines. It is also necessary to perform slope stability assessment prior to construction activities to ensure integrity of cap and adequate slope stability can be maintained (Sampson 2009).

***Landfill Settlement***

Physio-chemical, mechanical and bio-chemical processes change properties of disposed waste over time and cause settlement. Landfill settlements over time could result in formation of surface cracks to the final landfill cover; damages to the leachate and gas collection piping, water drainage systems and underground utilities; and formation of water holding depressions (Sampson 2009). To reduce

settlement effects, dynamic compaction is applied as controlled tamping of loose soils to raise or promote densification. For landfills, dynamic compaction can increase the material density and decreases the differential settlement (Sampson 2009). Waste removal and replacement with the clean fill could improve landfill densification. For development of previously closed landfills, application of geo-grid reinforcement can increase the cover soil strength placed above the geo-membrane. Use of adjustable components (i.e., shims and adjustable racking systems of solar mounting structures) can resist against the changes in the landfill deformations (Sampson 2009).

***Foundation Considerations***

Weights of the structures have a greater significance for installations on the landfill cap. Landfill cap depth needed to support a PV system depends on the dead weight loads contributed by the piers and footings (SRA 2008). Choice of suitable PV system depends on the weight of the system (i.e., tracking systems heavier than fixed tilt systems), type of waste and its properties, and side slope stability (Sampson, 2009). In general, flat surfaces have less foundation requirements. For sloped surfaces, lighter panels with a strong foundation (i.e., pre-cast or poured concrete footings) are preferred (e.g., Nellis Air Force Base single axis tracking systems) (Sampson 2009).

***Maintaining Integrity of the Cap System***

Maintaining the integrity of the cap is both an engineering and regulatory concern. Clearing, filling, grading, and compaction activities are generally performed during the development of the landfill for solar or wind system installation. During installation, extreme care is necessary not to damage the landfill cap or expose the waste. Installation on landfills requires good foundation placement, which depends on landfill cap characteristics to support the footings. Generally, during the planning stage, the cap design must consider anticipated loads by the PV system and its components.

For most cases, prefabricated concrete piers or concrete slabs could be sufficient enough to support a solar system. Wind turbine foundations on the landfill cap can utilize piles extended to bedrock, or floating adjustable footings, to address settlement issues. Also, requirements for trenching activities (i.e., electrical lining), existing or future landfill gas-to-energy recovery infrastructures should be considered (Sampson 2009). Adequate soil layer should exist for trenching activities with no or minimal impact on clay or geo-synthetic liner (Sampson 2009). If the landfill requires regular top surface (cap) maintenance (e.g., mowing of grass), placement of structures high enough for the operation of mowing equipment beneath the structures should be considered.

***Drainage***

Drainage and erosion are also major factors to consider. Developers will want to engineer methods of preserving top liners and soil caps to preserve slope stability and mitigate erosion that could degrade the cap. Drainage patterns at

closed landfills could also be impacted by renewable energy development and panel or turbine placement should be planned accordingly (Sampson 2009).

***Challenges in Using Closed Landfills For Solar and Wind Generation***

As discussed above, developing solar and wind energy systems on landfills present challenges. For example, Tessman Road Landfill (see **Section 2.5.2**, Select Project Profiles) employed flexible PV laminates side slopes (18 degrees) directly attached to the exposed geomembrane cover. Application of exposed geo-membrane cover with light weight panels (flexible PV strips) was a remedy for problems associated with steep side slope. In the case of Pennsauken Landfill Project, New Jersey; shallow pre-cast concrete footings were used to provide strong foundation for the PV system on the sloped surfaces overcoming complications of side slope installation. This facility used ballast foundation with crystalline panels on top surfaces for maximum energy production.

Construction of a wind turbine on a closed landfill in Hull Massachusetts used stainless steel piles extended to bedrock beneath landfill to mitigate settlement issues. In Karhlsruhe, Germany, a wind turbine was constructed on a landfill cap with a floating, adjustable spread footing foundation to correct for settlement.

### 2.5.2 Select Project Profiles

The following examples illustrate siting solar and wind energy facilities on landfill sites.

**Fort Carson Landfill at Fort Carson Army Base, Colorado.** Sited on 12 acres of a former construction debris landfill, the Army's largest solar energy project came online in early 2008 and utilizes PV panels to produce 2 MW (EPA 2011e). Some key aspects related to development include:

- Designated RCRA site; construction debris.
- Without costly excavation, capping or extensive cleanup, reuse options for the site were limited.
- Site was prepared for the solar facility by covering the inert landfill debris with two feet of soil, grading it for drainage and planting a native seed mix. Engineered cover is not required because landfill contains inert construction debris.

**Holmes Road Landfill. Houston, Texas.** City of Houston developed a 10 MW solar energy project on a 300 acre former landfill located near downtown. The solar farm will generate over 12.5 million kilowatt hours (kWh) annually accounting for approximately one percent of the city's annual energy purchases (EPA 2011f). Some key aspects related to development include:

- Cap depth is variable, complicating construction, tree removal, and site grading as consideration must be taken to ensure the cap's integrity.

- Utility distribution lines are located adjacent to the landfill on three sides.

**Nellis Air Force Base in Clark County, Nevada.** On 140 acres of a closed landfill site, this project utilizes tracking PV arrays to generate 14 MW, enough to provide 25 percent of the electricity needs at Nellis Air Force Base (EPA 2011g). Some key aspects related to development include:

- Designated RCRA site; polychlorethene and trichlorethene (methyl chloroform).
- Landfill was capped with native soils and groundwater monitoring wells were installed for sampling every five years.

**Pennsauken Landfill in Pennsauken, New Jersey.** This project, which came online in 2008, utilizes PV panels to produce 2.6 MW of electricity on the site of a closed municipal landfill (Messics 2009). Some key aspects related to development include:

- Majority of waste is bulky and consists of construction and demolition waste.
- Landfill is capped with vegetation, soils and membrane, and the site has groundwater treatment.
- Flatter areas of the landfill were developed; cheaper mounting system and construction costs.
- Grading and earthwork was minimized on older waste where most settlement has already occurred.

**Tessman Road Landfill, San Antonio, Texas.** This project, which came online in 2009, includes flexible PV solar cells installed directly to the cap to produce 135 kW of electricity on the site of a closed municipal landfill (Sampson 2009). Coupled with landfill gas technology, the site produces 9 MW of electricity. Some key aspects related to development include:

- Geomembrane cover system functions as both an effective landfill cap and mounting surface for flexible PV panels.
- The system covers 5.6 acres of 18-degree south facing slope.
- Exposed geomembrane is securely anchored rather than held in place with soil ballast.

**Hull Wind II, Hull, Massachusetts.** One turbine, capable of generating up to 1.8 MW, was constructed at a closed landfill site (Manwell et al. 2006). Some key aspects related to development include:

- A geotechnical investigation determined in sufficient detail the characteristics of the landfill and the bedrock underneath it, and that a foundation could be designed.
- Landfill does not have a protective liner. Piles were driven through the landfill to solid rock beneath to support the turbine, instead of waste supporting the turbine.

## 2.6 MINE SITES

Active and abandoned mine sites may serve as excellent locations for solar or wind energy projects, as the requirements for these facilities and the characteristics of mine lands may be well-suited to each other. Mine sites offer a number of potential advantages over greenfields, including the following:

- **Infrastructure.** Many mine sites have existing infrastructure that is often more economically viable to retrofit than to develop. Mines consume large amounts of energy to extract and distribute raw materials, meaning they often have good energy transmission capacity, proximity to transmission interconnections, and a road network capable of supporting large construction and maintenance vehicles.
- **Terrain.** Flat or terraced topography of mine sites make them suitable for solar or wind development. Tailings dam sites offer a mix of ideal terrain and suitable geology for turbine and solar array foundations.
- **Land acquisition.** Developers can avoid a complicated acquisition process because large mine sites often have one or only a few owners. Contaminated sites may offer certain purchase or lease incentives unavailable on greenfield sites. Coupled with low competing real estate demand, the purchase or lease of mine lands can lower project costs considerably.
- **Industrial zoning.** Renewable energy development is often considered compatible with surrounding land uses if sited on a former or active mine. There is often no time-consuming rezoning process and adjacent landowners may not object to clean energy development.
- **Reciprocal interest.** Mine operators may desire to utilize on-site renewable energy development as a way to meet state renewable portfolio standards or comply with other laws and regulations.
- **Public and community relations.** Developers considering mine sites may receive support or an expedited permitting process from communities eager to repurpose an abandoned or contaminated mine site.

- **Reduced liability programs.** EPA and most state voluntary cleanup programs offer mechanisms for limiting liability.

### 2.6.1 Technical Aspects

Mine sites may pose unique environmental considerations that may impose restrictions on the type and amount of renewable energy that can be developed on an active or closed mine site. For example, vertical cuts in the land (highwalls) can present a significant danger when in close proximity to structures or roads. Structures built above or below highwalls may be damaged by falling rock, and building near a highwall can also increase safety concerns (ODNR 2008).

Buildings and other such features located on mine spoil may settle, move or have leachate problems. Mine spoil and coal refuse, even if reclaimed, are prone to settlement and are subject to movement by freeze-thaw cycles. Subsidence, in the context of underground mining, is the lowering of the earth's surface due to collapse of bedrock and unconsolidated materials (sand, gravel, salt, and clay) into underground mined areas. Building above abandoned underground mines can cause structural problems if subsidence occurs (ODNR 2008).

The indiscriminate placement of steeply sloped unconsolidated mine spoil, prevalent on abandoned surface mines, can result in landslides that impact existing roads, structures, and streams. Drainage from deep mines and strip mine impoundments can also saturate native soil units on non-mined slopes and result in the instability of these slopes (ODNR 2008).

Impoundments left behind by a mining operation can pose many problems for site development, such as potential flooding problems due to heavy seasonal rains, and saturation of surrounding areas causing hillside instability. Surface and subsurface drainage patterns and flow rates may have been altered as a result of mining practices. This situation may have resulted in increased sediment in streams, which can reduce channel capacity and increased the frequency of flooding. Subsurface drainage can also be impacted by abandoned deep and strip mines (ODNR 2008).

### 2.6.2 Select Project Profiles

The following examples illustrate siting solar and wind energy facilities on mine sites.

**Green Mountain Wind Energy Center located in Somerset County, Pennsylvania.** Green Mountain Energy constructed eight 1.3 MW turbines on an abandoned coal strip mine in Pennsylvania. This wind farm was the first utility scale wind energy generation facility developed in the state. Operation began in 2000 and the project produces 10.4 MW (Disgen 2011). A key aspect related to development includes wind farm constructed on reclaimed area of former mining site.

**Glenrock Wind Energy Project located in Converse County, Wyoming.** Pacific Power has constructed 158 turbines with an output of 237 MW on the site of the old Dave Johnston coal strip mine The project became operational in 2009 (PacifiCorp 2011). Some key aspects related to development include reclamation of the nine-mile-long site involved extensive grading and contouring and reseeding with native vegetation, making the site suitable for wind energy, cattle grazing, and wildlife habitat.

**Chevron Solar Project in Questa, New Mexico.** The 1 MW Questa solar field covers approximately 20 acres and includes 173 solar trackers. The solar facility is located on the tailing site of a molybdenum mine. The project was completed in April 2011 (Chevron 2011b). Some key aspects related to development include:

- Remediation includes containment of waste rock and tailing source materials, ground water extraction and treatment, temporary ground water restrictions, and provision of alternate water supply, if needed.
- Solar project includes an evaluation of various soil cover depths in preparation for closure of the mill tailings area at the end of mining operations.

## 2.7 AGRICULTURAL LANDS

With continuing use of incentives to generate renewable energy, developers have demonstrated a preference for marginal and impaired private lands, particularly agricultural parcels that may no longer be economically viable for agricultural production or where land is taken out of farm production for lack of water. They are often attracted to this farmland because of its proximity to existing electricity infrastructure such as transmission lines and substations. The degraded nature of the land may also make it less likely to have significant biological, environmental, or agricultural value that may make the land unsuitable for renewable energy development. Marginal and impaired agricultural land may offer several advantages, including the following:

- **Infrastructure.** Some farmlands are located in close proximity to market centers, transmission interconnections, and other infrastructure, including road networks capable of supporting large construction and maintenance vehicles, which can often be reused for energy project construction, operation, and maintenance.
- **Terrain.** The flat or gently sloping topography of farmlands make them suitable for solar or wind development.
- **Land acquisition.** Developers can avoid a complicated acquisition process because farmlands often have one or only a few owners. The land value for marginal or impaired farmlands can lower project costs considerably. In some states, landowners may benefit from a

reduced property tax assessment if they develop renewable energy on farmland that is impaired either due to physical limitations or adverse soil conditions.

- **Agricultural zoning.** Renewable energy development is often considered compatible with surrounding land uses if sited on former farmland. Projects can often be considered on nonprime agricultural land pursuant to a conditional use permit if accompanied by appropriate mitigation measures. Encouraging renewable energy development on impaired or marginal farmlands directs this development away from prime farmland and environmentally sensitive areas.
- **Reciprocal interest.** Owners of marginal or impaired farmlands may be looking for alternative forms of income.
- **Reduced liability and cleanup costs.** Renewable energy development may require less intensive cleanup efforts than other potential reuses of contaminated agricultural land. In addition, developers may be shielded from liability arising from existing on-site contamination.
- **Public and community relations.** Developers considering marginal or impaired farmlands may receive support or an expedited permitting process from communities eager to utilize these impaired farmlands instead of prime farmland and farmland with environmentally sensitive areas.

### 2.7.1 Technical Aspects

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on marginal or impaired farmlands. For example, smaller sites may not support utility-scale development or certain energy technologies.

Marginal or impaired farmlands may also pose unique environmental considerations, including sensitive habitats adjacent to farmland. Existing farming operations can limit the placement of renewable energy infrastructure.

### 2.7.2 Select Project Profiles

The following examples illustrate siting solar and wind energy facilities on impaired or marginal farmland sites.

**Westlands Solar Park, King County California.** The Westlands Solar Park is a master planned infrastructure development in Central California comprising primarily of a 2.7 plus gigawatt (GW) solar park with phased generation development, transmission, and other facilities. The project is proposed on 30,000 acres of land owned by three private landowners and Westlands Water District. Early Phase 1 projects are expected to begin operation as early as 2013-2015 (Westlands 2011). The land includes properties affected by lack of

drainage facilities to remove water runoff containing high levels of selenium. Some key aspects related to development include:

- Project is unique among others in the Central Valley because the land has been given a state designation as a competitive renewable energy zone and the project is unanimously supported by agricultural and environmental organizations.
- Land within the Westlands Solar Park also has the advantage of being under existing transmission, which makes it an ideal location for a large solar park

**Project West Wind, Wellington, New Zealand.** Meridian is using 62 turbines on marginal farmland to produce 142.6 MW of wind energy (NZWEA 2011). The project was completed in 2009. Some key aspects related to development include:

- The turbines were installed and commissioned in groups, allowing the site to generate increasing amounts of electricity as work progressed.
- The turbines are linked to an on-site substation with underground cabling. From the substation, the wind farm is connected with a short overhead line to a double circuit transmission line.

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# SECTION 3
# SOLAR AND WIND ENERGY TECHNOLOGY AND DEVELOPMENT CONSIDERATIONS

## 3.1 SOLAR POWER TECHNOLOGIES

Solar radiation may be harnessed through various technologies and transformed to usable energy, such as heat and electricity. This section examines the large-scale commercial applications of solar energy capture. Two basic solar energy technologies that produce electrical power are CSP systems and PV systems.

### 3.1.1 Concentrating Solar Power Systems

CSP technologies use mirrors to concentrate sunlight onto receivers that convert it to heat. The thermal energy is then used to drive a generator via steam turbine or heat engine to produce electricity. CSP technologies are the most suitable solar technologies for large utility-scale applications. The three main types of CSP technologies are linear concentrator, dish/engine, and power tower systems. CSP technologies require cooling of the exhaust steam so that it condenses back into water before being heated again into steam. Wet cooling is many times more efficient than dry cooling and uses 500 to 800 gallons of water per megawatt hour (MWh) (Solar Energy Industries Association 2010).

***Linear Concentrator Systems***

Linear CSP systems use a large field of long, rectangular, U-shaped mirrors tilted toward the sun that capture and focus solar energy onto linear receiver tubes that run along the length of the mirrors. The receiver contains a fluid (oil or water) that is heated by the sunlight and used to boil water in a steam-turbine generator to produce electricity.

The two major types of linear CSP systems are parabolic trough systems and linear Fresnel reflector systems. Parabolic trough systems are the predominant CSP systems currently operating in the US. They use collectors in which the receiver tube is positioned along the focal line of each parabolic mirror. Currently the largest individual trough systems generate 80 MW of electricity.

**Array of parabolic troughs at the National Solar Energy Center in Israel. Credit: Sandia National Laboratory**

In linear Fresnel reflector systems, the receiver tube is positioned above several flat or slightly curved mirrors that are mounted on tracking structures. In some systems, a small parabolic mirror may be added atop the receiver to further focus the sun's rays.

***Dish/Engine Systems***

The dish/engine system produces relatively small amounts of electricity (3 to 25 kW) compared to other types of CSP technologies. Dish/engine systems use mirrored dishes (about 10 times larger than a backyard satellite dish) to focus and concentrate sunlight onto a receiver. The receiver is mounted at the focal point of the dish. To capture the maximum amount of solar energy, the dish assembly tracks the sun across the sky. The receiver is integrated into a high-efficiency "external" combustion engine. The engine has thin tubes containing hydrogen or helium gas that run along the outside of the engine's four piston cylinders and open into the cylinders. As concentrated sunlight falls on the receiver, it heats the gas in the tubes to very high temperatures, causing the gas to expand inside the cylinders. The expanding gas drives the pistons. The pistons turn a crankshaft, which drives an electric generator. The receiver, engine, and generator comprise a single integrated assembly mounted at the focus of the mirrored dish.

**Solar dish/engine system. Credit Solar Energy Development PEIS.**

***Power Tower Systems***

Power tower systems use a large field of flat, sun-tracking mirrors, known as heliostats, to focus sunlight onto a receiver, which is located atop a tower. A fluid in the receiver, either water or molten nitrate salt, is heated and used to generate steam, which, in turn, is used in a conventional turbine generator to produce electricity. The molten nitrate salt has heat-transfer and energy-storage

capabilities, which allows for continued production of electricity during cloudy weather and at night.

### 3.1.2 Photovoltaic Systems

**The PS10 Solar Power Plant (Spain) concentrates sunlight from a field of heliostats onto a central solar power tower. Credit: Solúcar PS10**

PV systems use solar cells consisting of semiconductor materials similar to those used in computer chips to capture the energy in sunlight and convert it directly into electricity. PV systems must be scaled over a very large area in order to be effective for utility-scale applications. The process by which a PV cell converts sunlight into electricity is called the photoelectric effect. Through this process, the sunlight absorbed by the semiconductor material knocks electrons loose from their atoms, allowing them to flow through the material and generate electric current.

There are three main types of materials used for solar cells. Traditional solar cells are made from silicon. These cells are usually flat-plate and are the most efficient. The second type is the thin-film solar cell made from amorphous silicon or non-silicon materials, such as cadmium telluride. The third and newest type of solar cell is made from a variety of new materials besides silicon, including solar inks, solar dyes, and conductive plastics. Some new solar cells use plastic lenses or mirrors to concentrate sunlight onto high-efficiency PV materials. These systems are cost effective for use in utility-scale applications because they produce a significant amount of energy using smaller quantities of more efficient, albeit more expensive, materials (NREL 2010).

PV cells are connected into units to form PV modules, which in turn are combined to make PV arrays. The size of an array depends on the amount of sunlight and the needs of the customer. For utility-scale electricity generation, hundreds of arrays are interconnected to form a single large system. Modules and arrays are often combined with other components, such as those that convert the current within the cell material to usable electricity, batteries to store some of the electricity, and mounting structures that point them toward the sun. These components, referred to as the balance-of-system components, combined with modules and arrays create a complete PV system. There are two types of PV systems in use today: flat-plate systems and concentrated PV systems.

Water requirements for PV systems are approximately 20 gallons per MWh for the purpose of cleaning solar panels (Solar Energy Industries Association 2010).

In some operations where water availability is especially limited, a PV operator may choose not to wash the panels at all, eliminating water consumption altogether.

***Flat-plate Photovoltaic Systems***

The most common array designs use flat-plate PV panels, which can either be fixed in place or allowed to track the sun. These panels respond to both diffuse and direct solar radiation, making them useful even on cloudy days when the diffuse radiation accounts for nearly 100 percent of the total radiation. On a sunny day, an estimated 10 to 20 percent of the total solar radiation comes from the diffuse component of sunlight.

**Arizona Public Service's Prescott Airport Solar System Showing a Tracking Flat-Plate, Nonconcentrating PV System. Credit: Arizona Public Service**

Generally, flat-plate PV panels are mounted on stationary structures with a tilt at a fixed angle determined by the latitude of the site, the requirement of the load, and the availability of sunlight. The fixed arrays are advantageous in that they are simple, inexpensive, and lightweight. However, because their orientation to the sun is fixed, often at a less than optimal angle, they receive less energy per unit area compared with a tracking array. The flat-plate tracking arrays are primarily mounted on one-axis tracking structures, which are designed to track the sun from east to west.

***Concentrated Photovoltaic Systems***

Concentrated PV systems use lenses or mirrors to concentrate sunlight on solar cells. The concentration of sunlight allows for greater efficiency and reduction in size and number of cells. These systems must track the sun to keep light focused on the PV cells. They are primarily mounted on two-axis tracking structures, which are designed to track the sun's daily and seasonal course. One-axis tracking systems are also sometimes used.

**A 6.2 kilowatt array, part of a solar power plant project in Spain. Credit: SolFocus**

Both reflectors and lenses have been used to concentrate light for PV systems. The most promising lens for concentrated PV application is the Fresnel lens,

which uses a miniature saw tooth design to focus incoming light. The best lenses, however, can transmit only 90 to 95 percent, and in practice even less, of incident light. In addition, lenses cannot focus diffuse sunlight, which makes up nearly 10 to 20 percent of the radiation on a clear day.

While concentrated PV systems lower costs by reducing PV material needs, they require sophisticated tracking devices and expensive concentrating optics. High concentration ratios also introduce an excessive heat, which can decrease cell efficiencies and damage solar cells.

## 3.2 WIND POWER TECHNOLOGIES

### 3.2.1 Technology Overview

A wind turbine is a mechanical assembly that converts the energy of wind into electricity. A wind turbine consists of a blade or rotor, a drive train (usually including a gearbox and a generator), a tower, and other equipment, including controls, electrical cables, ground support equipment, and interconnection equipment. The blades turn in the moving air and power an electric generator that supplies an electric current. The blades act much like an airplane wing. Blowing wind causes a pocket of low-pressure air to form on the downwind side of the blade, which in turn causes the blade to be pulled toward that pocket. This force causes the rotor to spin like a propeller and turn a shaft. The rotational energy of the shaft turns the generator to produce electricity. Wind turbines are mounted on a tower to enable them to capture the most energy. Tower height affects the amount of power that can be extracted by a given wind turbine. At 98 feet or more above ground, wind turbines can take advantage of faster and less-turbulent wind.

**Wind turbines near Palm Springs, CA. Credit: Arizona Solar Center**

Wind turbines fall into two basic groups, horizontal-axis propeller-style variety, like traditional farm windmills, and vertical-axis design, like the eggbeater-style Darrieus model. The horizontal-axis turbines are the most common, constituting nearly all the utility-scale turbines. These typically have either two or three blades. The three-blade turbines are operated upwind with their blades facing into the wind.

Wind turbines are available in a variety of sizes, and, subsequently, a variety of power ratings. Utility-scale wind turbines for land-based wind farms have rotor diameters ranging from 130 to about 395 feet, and towers that reach 130 to 425 feet high.

Utility-scale turbines range in power rating from 100 kW to as large as several MWs. Larger turbines are grouped together into wind farms, which provide bulk power to a utility power grid. Wind power plants are modular, which means they consist of small individual modules (turbines), and, depending on electricity demand, can easily modify production capacity.

### 3.2.2 Small and Large Wind Systems

Small scale wind turbines (also known as home or residential wind turbines) can either be connected to the utility grid or stand-alone as an "off-grid" application, normally providing electrical power for home, farm, school, or business applications. Small scale wind machines can have blade length between three feet and 30 feet, with a 100 foot tower, and can power between 1/4 to 6 average American homes (ASU 2011).

Large scale wind turbines (also known as utility wind turbines) are normally tied directly into the utility grid and are used to provide electrical power for entire communities and municipalities. Each of these large, "utility-scale," wind turbines can have blade lengths up to 150 feet and sit on a 200 foot tower, and produce enough electricity for 500 to600 average homes per year (ASU 2011).

### 3.2.3 Community Wind

Community wind is a growing sector of wind development that increases local energy independence. Community wind projects are owned by a variety of individuals, including local small business owners, farmers, local organizations including schools and universities, as well as Native American Tribes, rural electric cooperatives, municipal utilities, and religious institutions. These projects can range from a single turbine to a community-owned commercial-scale wind farm.

Rural landowners who possess windy land currently benefit from the wind resource primarily by leasing their land to large wind developers who sell the wind energy. Others have installed their own wind turbines, individually or through local small businesses, including farms, and local organizations such as schools, universities, Native American Tribes, rural electric cooperatives, municipal utilities, and even religious institutions. These projects keep more dollars in local communities, preserve local energy independence, and protect the environment.

The key feature of community wind is that local community members own and have a significant financial stake in the project beyond just land lease payments and tax revenue. Community wind projects can be any size, ranging from a single turbine to more than one hundred, yet typically serve local communities

or consumers. Community wind projects have been installed throughout the country and are in the planning stages in virtually every state with wind power development underway.

## 3.3 SOLAR AND WIND POWER PLANT DEVELOPMENT CONSIDERATIONS

### 3.3.1 Development Considerations Common to Solar and Wind Plants

***Site Characterization***

Solar and wind power generation depends on selecting a suitable site. Many different factors determine whether a particular site warrants consideration for potential solar or wind power generation. Once a preliminary screening is completed, as in the RDEP Solar and Wind Site Assessments (Sections 4 and 5), developers will want to conduct more detailed research before committing to project construction and operation. Steps to undertake may include resource surveys (e.g., rare plants, biological, or cultural surveys), soil studies, surface hydrology and wetlands mapping, and microsite meteorological testing. Developers will also want to calculate the cost necessary to construct access roads (if necessary) and consider any compatibility issues with surrounding land uses. Finally, power purchase agreements (PPA) and transmission grid interconnection are critical financial aspects of any project and will vary by location.

Overall, developers are looking for a site that can generate revenue. According to Steve Birndorf (Borrego Solar), developers look for areas where regulatory and funding programs are in place to encourage development of projects (Birndorf 2011). Having these types of programs in place help expedite the process and can provide financial incentives to ensure the project is economically feasible. Developers also look for other features such as flat land, nearby transmission connections, older disturbed lands, and good solar or wind potential. These factors ultimately determine the costs associated with development and influence a developer's return on investment.

***Land Agreements***

Solar and wind developers need to work with the land owner(s) to determine the nature of the contractual relationship between land owner and developer. Issues to be agreed upon include: ingress and egress rights, transmission rights, compensation terms, project life, and reclamation provisions at project end. The terms need to include reasonable access for solar or wind resource assessment, construction, operation, maintenance and reclamation activities. Compensation can be in the form of a fixed lease fee per acre, fixed fee per kWh or a percentage of gross revenue attributable to the landowner's parcel.

***Environmental Review***

Additional compliance with NEPA is required for any project with a federal nexus, such as construction on federal land, transmission line siting on federal land, federal funding (e.g., DOE Loan Guarantee Program), or interconnection

with the federal grid (e.g., Western Area Power Administration). Depending on the level of review required and the potential for sensitive species, the developer must undertake, at its cost and, as required, studies of threatened and endangered species, land disturbance, and wetlands and a review of the results of consultation with interested local, state or federal officials, and interested citizens or citizen groups. They may also be required to perform historical and archeological studies and visual impact studies.

***Permitting***

Permitting requirements to construct and operate a solar or wind plant vary widely depending upon who owns the land and any federal, state, or local restrictions on land use. Typically, land use permits and building permits are the minimum required for solar and wind plants.

***Site Preparation and Construction***

Once a developer has committed to a project on a specific site, the site must be prepared for construction. This includes constructing access roads as necessary, clearing, and grading. Depending on the amount of site modification needed, the types of heavy construction equipment and the scope of their use will vary.

Many sites are subject to local noise and construction ordinances, which must be adhered to. Also, the developer may be required to carry out detailed, comprehensive resource surveys or have a qualified specialist on site to monitor site preparation and construction activities.

The type and amount of vehicles used to transport workers and equipment may require the preparation of a transportation plan and best management practices to limit impacts on traffic and road systems.

***Transmission Lines***

To minimize land use impacts and control costs, developers desire project sites that are in close proximity to the existing electric transmission grid. The power from a wind or solar project needs to be delivered to the grid at an approved interconnection point (typically a new or existing substation). Acquiring a route for the interconnection circuits will involve the negotiation of ROW from one or more landowners, plus permitting and construction costs.

New interconnection circuits are expensive, with costs depending on the voltage level, the types of terrain and associated land uses along the interconnection route, and whether or not a portion of the installation is underground. Transmission line costs can be very high, and access to transmission lines of appropriate capacity is a very important siting factor. Depending on the line voltage level and the length of the transmission line, costs for a 100-MW capacity, for example, can range from $50,000 to $180,000 per mile (DOE 2008). Therefore, the proximity of potential solar and wind sites to transmission lines is very important. Consequently, relatively small projects are normally built near existing transmission facilities, while larger projects can

justify the costs of interconnection at greater distances from existing transmission. Purchasing capacity at an existing substation, rather than constructing a new substation, can lower project costs. As such, sites with close proximity to existing substations may be more desirable.

Transmission line preparation and construction will require surveys, staking, clearing, access, and the use of heavy construction equipment.

***Water Use and Availability***

Arizona has five Active Management Areas, located in regions with a heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code and management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

***Interconnection and Wheeling***

Utilities, private companies or power marketing administrations with transmission systems must allow solar and wind plants to interconnect to their transmission systems; however, the requirements that must be met, the studies to be undertaken, and the interconnection equipment that will be required are determined by the transmission-owning entity, where the costs are usually borne by the developer. Studies such as capacity limitations, load flow analysis, voltage controls and system protection are the norm. Recent legislation has caused the rules and requirements to be re-visited and standards for interconnection equipment and timelines have been developed for two classes of generation–20 MW or less, or greater than 20 MW.

Moving the solar or wind generated energy to the purchaser of the energy through the utility or other entity owned transmission system is called wheeling. The fee for this wheeling may be determined through negotiation or defined by a tariff filed by state or federal regulators.

In June 2007, the ACC initiated a rulemaking process to establish statewide interconnection standards for distributed generation. This proceeding is still in progress; however, the commission has recommended that the utilities use the *Interconnection Document* as a guide. This document applies to systems up to 10 MW in capacity (DOE 2011a).

The state's utilities independently developed interconnection agreements for distributed generation prior to the ACC's ongoing proceeding to establish statewide standards. The Salt River Project (SRP), which is not regulated by the ACC on utility matters, developed distributed generation interconnection guidelines and an interconnection agreement based on draft rules and a report released by the ACC in 1999 and 2000, respectively. Tucson Electric Power and Arizona Public Service have similarly established their own interconnection procedures for distributed generation systems. It is likely that Arizona's

regulated utilities will adopt the ACC's interconnection standards when the final rules are adopted (DOE 2011a).

***Net Metering***

In Arizona, net metering is available to customers who generate electricity using solar, wind, hydroelectric, geothermal, biomass, biogas, combined heat and power, or fuel cell technologies. The ACC has not set a firm kW-based limit on system size capacity; instead, systems must be sized to not exceed 125 percent of the customer's total connected load. If there is no available load data for the customer, the generating system may not exceed the customer's electric service drop capacity. SRP modified an existing net-metering program for residential and commercial customers in October 2009. Net metering is now available to customers who generate electricity using PV, geothermal, or wind systems up to 100 kW in alternating current peak capacity.

***Power Purchase Agreement***

The solar or wind developer must find a buyer for the energy to be generated in order to obtain project financing as the buyer determines the potential revenue stream amount and time frame. The PPA defines the terms for this long term revenue stream. A creditworthy buyer is necessary to ensure a predictable long term cash flow for project financing approval.

***Financing and Incentives***

With the PPA in hand, the solar or wind developer can work with financiers to determine the terms of the loans, due diligence and assignability of documents. The financing is typically used to provide for the solar collectors, and power generation systems (e.g. turbines) procurement and construction/installation costs though other project costs may also be included.

Identifying and leveraging federal, state and utility incentives and grants is an important part of making solar and wind energy systems cost-effective. A number of policies and incentives are available to facilitate the development of energy projects. The DOE Database of State Incentives for Renewables & Efficiency provides a comprehensive database of information on state, local, utility, and federal incentives and policies that promote renewable energy and energy efficiency (http://www.dsireusa.org/). Select federal and state programs include:

*Federal Incentives and Grants*

- **Modified Accelerated Cost Recovery Program.** Under the federal Modified Accelerated Cost-Recovery System, businesses may recover investments in certain property through depreciation deductions. The system establishes a set of class lives for various types of property, ranging from three to 50 years, over which the property may be depreciated. A number of renewable energy technologies are classified as five-year property (26 USC Section 168(e) (3) (B) (vi)) under the system, which refers to 26 USC

Section 48(a) (3) (A), often known as the energy investment tax credit or Investment Tax Credit to define eligible property (IRS 2011).

- **DOE Loan Guarantee Program.** DOE can issue loan guarantees to mitigate the financing risks associated with clean energy projects (DOE 2011b).
- **Tribal Energy Grant Program.** The DOE Tribal Energy Program promotes tribal energy sufficiency, economic growth and employment on tribal lands through the development of renewable energy and energy efficiency technologies. The program provides financial assistance, technical assistance, education and training to tribes for the evaluation and development of renewable energy resources and energy efficiency measures (DOE 2011c).
- **Renewable Energy Production Incentive.** Established by the federal *Energy Policy Act of 1992*, the federal Renewable Energy Production Incentive provides incentive payments to qualified tax-exempt entities for electricity generated and sold by new qualifying renewable energy facilities. Qualifying systems are eligible for annual incentive payments of 1.5 cents per kWh in 1993 dollars (indexed for inflation) for the first 10-year period of their operation, subject to the availability of annual appropriations in each federal fiscal year of operation. The incentive was designed to complement the federal renewable energy production tax credit, which is available only to businesses that pay federal corporate taxes (DOE 2011d).

*State Incentives*

- **Arizona Renewable Energy Standard and Tariff.** In 2006, the ACC approved the Renewable Energy Standard and Tariff (REST). These rules require that regulated electric utilities must generate 15 percent of their energy from renewable resources by 2025. Each year, Arizona's utility companies are required to file annual implementation plans describing how they will comply with the REST rules. The proposals include incentives for customers who install solar energy technologies for their own homes and businesses (ACC 2011).
- **Renewable Energy Production Tax Credit.** Qualified renewable energy systems installed on or after December 31, 2010, may be eligible for the tax credit based on the amount of electricity produced annually for a 10-year period (DOE 2011d).
- **Solar Energy Equipment Sales Tax Exemption.** Arizona provides state tax incentives for the sale or installation of "solar energy devices," as these devices are defined within the Arizona Revised Statutes. Transaction privilege ("sales") tax exemptions apply to retail sales of solar energy devices, and installations of such

devices under the prime contracting classification. Applies to solar energy devices and any other device or system designed for the production of solar energy for onsite consumption (ASC 2011).

***Operation and Maintenance***

The solar or wind developer must include provisions for operations and maintenance for financing because it is critical to the successful long-term operation of the solar plant or wind turbine. The operations and maintenance terms typically specify a solar plant or wind turbine availability percentage (usually 95 to 98 percent of the year) and outline the nonperformance penalties (DOE 2008).

### 3.3.2 CSP Plant Development Considerations

***Solar Resource***

The amount of power generated by a CSP plant depends on the amount of direct sunlight. These technologies use only direct-beam sunlight, rather than diffuse solar radiation. The southwestern US potentially offers the best development opportunity for CSP technologies in the world.

***Land***

A parabolic trough solar power plant requires approximately five acres (20,000 $m^2$) per MW of plant capacity. Plants with thermal storage and higher capacity factors will require proportionally more land per MW. Siting studies have generally found that land with an overall slope of less than one percent are the most economical to develop (DOE 2008). Potential sites should have reasonable land costs, be generally level, and be close to transmission, water, and natural gas. The specific slope and topography of the land will then determine the comparative acceptability of competing sites through their impact on site costs for grading and preparation. Land characteristics are thus most effectively used as screening tools in selecting acceptable sites for further evaluation.

***Water***

The primary water uses at a Rankine steam solar power plant are for the steam cycle, cooling, and washing mirrors. Historically, parabolic trough plants have used wet cooling towers for cooling. The cooling uses approximately 90 percent of the water. The steam cycle uses approximately eight percent and mirror washing uses the remaining two percent (DOE 2008).

Annual water consumption at trough plants is approximately 750 acre-feet for a 100 MW plant (DOE 2008). If sufficient water is not available for cooling, either dry cooling or wet-dry systems are necessary. These options can increase plant electricity costs by 10 percent or more, indicating the desirability of sites with sufficient aquifer or other water resources. Treatment of raw water is required for plant use.

***Natural Gas***

Solar thermal power plants have the capacity to provide firm power in a hybrid configuration where fossil fuel, preferably natural gas, can supplement the solar energy resource. This is particularly important during peak demand periods where electricity's value is high. If power firming is a requirement of the power buyer, proximity to natural gas pipelines is a very important factor. It is a significant, though usually not critical, determinant in the viability of hybrid operation. Very large distances can make this option economically unacceptable.

### 3.3.3 PV Plant Development Considerations

***Solar Resource***

Concentrating PV systems require high direct normal irradiance (DNI), or beam radiation, for cost-effective operation. Flat-plate, non-concentrating PV systems use global diffuse solar radiation, which includes the DNI and scattered blue-sky light. Generally, under clear sky conditions, 85 percent of the sunlight is DNI and 15 percent is scattered light that comes in at all different angles (DOE 2008). The scattered light, which cannot be used by any concentrating system, can be used by flat-plate PV systems. Sites that have a good solar resource for concentrating systems are also great for flat-plate systems, since the global solar resource includes the DNI.

***Land***

All large PV systems require fairly flat land with slopes of less than three percent. The slope of the land has an impact on construction costs. PV power plants require a large area for their solar collector field. Approximately five acres are required per MW of electricity produced in a PV power plant.

***Water***

Water is not required for the normal operation of any PV system. Water is used chiefly for occasional cleaning of the PV modules, Fresnel covers, or the reflective surfaces. The washing interval is determined by local site conditions and an economic analysis of cleaning costs versus increased energy production. Cleaning flat-plate PV systems can be as simple as driving a water truck between the rows and spraying the PV modules. Many installations are not regularly cleaned due to cost, and rely on wind and rain to keep the modules sufficiently clean.

### 3.3.4 Wind Power Plant Development Considerations

***Wind Resource***

A wind project's energy production and life-cycle economics depend more on the strength of the wind resource than any other factor. Therefore developers must seek windy locations when prospecting for potential development sites. A rule-of-thumb is that a site's annual average wind speed should be 15.7 miles per hour (mph) or stronger at the wind turbines' hub height to be considered at least marginally attractive for project development (GEC undated). Other

project cost variables may require stronger average winds in order to realize economic viability.

***Land***

In general, land requirements for wind power projects vary considerably and mostly depend on two sets of factors. The first set pertains to the developer's goals in terms of preferred windy locales and desired project size or power capacity (i.e., number of turbines). Larger projects naturally require more land area, and larger projects also tend to yield lower costs of energy due to economies of scale.

The second set of factors pertains to local landform characteristics and existing patterns of land use and land ownership. Various landforms, including high-plains, valley floors, hills, ridges, plateaus, and mountains have differing exposures to prevailing wind conditions. They also offer differing wind power project siting opportunities. For example, only the tops of ridges are practical sites for wind turbines due to superior wind exposure, whereas high-plains can experience similar wind conditions across a broad area. Accordingly, land requirements for a wind power project will vary depending on the landform type. Even after a given landform is identified, other factors such as land ownership patterns, land use, and land cover patterns will influence how a wind project is ultimately designed and how much land is ultimately required.

***Wind Turbine Transportation and Installation Issues***

Due to the ever increasing size of wind turbines, such as 80 to100 meter hub heights, transporting wind turbines is increasing in cost. Turbine tower sections are large diameter, as long as possible, and extremely heavy for transport by specialized trucking equipment to the site. The same is true for the turbine hub and blades in excess of 70 meters. Trucking equipment require large turning radius, so site access may require road improvement to delivery turbine components. An additional consideration for installation of large wind turbines is the cost and availability of large cranes in the vicinity of the wind farm site.

Soil conditions must be favorable for road construction and for installing underground facilities such as wind turbine foundations, fiber-optic communication lines, and electrical conductors. All of these factors have cost and land use implications and are therefore an important consideration when evaluating prospective project sites.

## 3.4 SOLAR AND WIND POWER PLANT TRENDS

### 3.4.1 US Grid-Connected Solar Market Trends

***PV Technology***

Annual US grid-connected PV installations doubled to 890 MW in 2010 compared with installations in 2009 (IREC 2011). The following factors helped drive PV growth in 2010:

- Stability in federal incentive policy.
- Capital market improvements.
- State renewable portfolio standards requirements encouraging investments in utility-scale solar plants.
- State financial incentives, including commercial distributed installations.
- Continued federal stimulus funding.
- Decline in PV module prices.

The largest growth of grid-connected PV occurred in the utility sector. Utility sector photovoltaic installation quadrupled over 2009 installations (15 to 32 percent). Of the 10 largest PV installations in the US, six were installed in 2010. The two largest US PV installations were installed in 2010 (58-MW Sempra/First Solar plant in Boulder City, Nevada and 35-MW Southern Company/First Solar plant in Cimarron, New Mexico).

State renewable portfolio standards requirements are encouraging investments in utility-scale solar plants in some states. Federal tax incentives and grants and lower costs for PV modules also made these investments attractive. Construction has begun on many additional utility sector installations, and utilities and developers have announced even more projects to be built in the next few years. Installations in this sector seem poised for continued growth (IREC 2011).

Although the number of utility PV installations remains small, the average system size is large (over 1.45 MW). These installations represent 32 percent of all installations on a capacity basis. Only 34 utility installations greater than 1 MW totaled 239 MW, or 27 percent of the capacity total of US systems installed in 2010 (IREC 2011). In 2009, just six such installations totaled 60 MW. Large utility installations attract significant attention, but small installations also occur in the utility sector. The average size of grid-connected PV installations varies from state-to-state, depending on available incentives, interconnection standards, net metering regulations, solar resources, retail electricity rates, and other factors.

In 2010 Arizona had 63.6 MW of grid-connected PV capacity installed, a 201 percent change from 2009 which saw 21.1 MW of capacity installed. Cumulatively (through 2010), Arizona has the fourth largest amount of installed grid-connected PV capacity (110 MW) (IREC 2011).

***CSP Technology***

In 2010 the demand for CSP was insignificant. However, there are several very large projects underway in California and Arizona. Major CSP development highlights in Arizona include the Solana project (250 MW) scheduled to be

completed in 2012, and the University of Arizona Tech Park project (5 MW) scheduled to be completed in 2011.

Between 2011 and 2016, GBI Research forecasts that utility-owned or sponsored CSP capacity additions in the US will approach 6,360 MW, led by the likes of Southern California Edison (2,500 MW projected), Pacific Gas & Electric (1,600 MW), NV Energy (800 MW), San Diego Gas & Electric (700 MW), and Arizona Public Service (600 MW), among others (Solar ETC 2011).

CSP has some legitimate advantages on PV at scale that are winning over wavering utilities. Higher capacity factors allow CSP plants to produce more power per MW installation, and output of PV in the desert drops due to factors like extreme heat, losing as much as 15-20 percent productivity for a crystalline silicon panel (Solar ETC 2011). CSP also offers efficiency rates that solve intermittency problems that utilities fear with other renewables. However, there is greater uncertainty with the future growth of CSP technology in the US due to financing, permitting, water use, and environmental approvals because of the large land requirements for this type of technology. Because of these uncertainties, the progression of CSP projects is not at all as clear as it was in 2010 (CSP Today 2011).

### 3.4.2 US Wind Market Trends

***Installation Trends***

The US wind power market slowed in 2010, with 5,113 MW of new capacity added, bringing the cumulative total to more than 40,000 MW (DOE 2011e). Through 2010, Arizona had cumulative total of 128 MW of utility-scale wind power (AWEA 2011). Wind power installations in 2010 were similar in magnitude to those recorded in 2007; however, installations were just half those seen in 2009 and were 40 percent lower than in 2008. Cumulative wind power capacity grew by 15 percent in 2010. Factors slowing growth in 2010 included: the delayed impact of the global financial crisis (which impacted the apparent availability of capital for 2010 projects that were being planned in 2009); relatively low natural gas and wholesale electricity prices, which, in part, inhibited the development of merchant projects that were more-common in previous years; and slumping overall demand for energy, which reduced utility demand for wind energy power purchase agreements.

More than 20 MW of small wind turbines (100 kW and less in size) were sold in the US in 2009. These installation figures represent a 15 percent growth (in terms of capacity) in annual sales relative to 2008, yielding a cumulative installed capacity of small wind turbines in the US of roughly 100 MW by the end of 2009 (AWEA 2010). Within this market segment, there has been a trend towards larger, grid-tied systems. Sales of turbines less than1 kW in size (often used off-grid) were flat from 2006-09 at roughly 3 MW. Sales of 1 to 10 kW turbines (often used in the grid-tied residential market), on the other hand, grew from

less than 2 MW in 2006 to 8 MW in 2009, while sales of 11 to 100 kW turbines (often used in the grid-tied commercial, light industrial, and government market) grew from around 3 MW in 2006 to almost 10 MW in 2009 (AWEA 2010). Growth in this sector has been driven, at least in part, by a variety of state incentive programs (refer to **Section 3.3.1**, Development Considerations Common to Solar and Wind Plants, for a discussion of select Arizona incentive programs). In addition, wind turbines equal to or under 100 kW in size are eligible for an uncapped 30 percent federal investment tax credit.

***Future Outlook***

With federal incentives for wind energy in place through 2012, an improved project finance environment in 2010 and early 2011, and lower wind turbine and wind power pricing, modest growth in annual wind power capacity appears likely in 2011 relative to 2010. Additions are expected to remain well below the 2009 high, however, due in part to relatively low wholesale electricity prices and limited need for new electric capacity additions, which are likely to reduce merchant wind power development and utility demand for wind energy PPAs, and in part to existing state-level renewable portfolio standards programs that, in aggregate, are not sizable enough to support continued wind power capacity additions at 2008 and 2009 levels. A variety of forecasts suggest that wind power installations in 2011 may fall within the range of 4,450 MW to 8,000 MW, substantially below the 2009 high of 9,993 MW.

The DOE suggests four other areas where supportive actions may be needed in order to reach such annual installation rates. First, the nation will need to invest in significant amounts of new transmission infrastructure designed to access remote wind resources. Second, to more effectively integrate wind power into electricity markets, larger power control regions, better wind forecasting, and increased investment in fast-responding generating plants will be required. Third, siting and permitting procedures will need to be designed to allow wind power developers to identify appropriate project locations and move from wind resource prospecting to construction quickly. Finally, enhanced research and development efforts in both the public and private sector will be required to lower the cost of offshore wind power and incrementally improve conventional land-based wind energy technology (DOE 2011e).

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# SECTION 4
# SOLAR SITE ASSESSMENT

The following site assessment evaluates the suitability of CSP and PV solar technologies on the 64 nominated sites. Results of the solar assessments are provided in **Table 4-1**, Solar Potential Screening Results.

The general goal of the analysis is to provide a preliminary assessment of the overall potential for developing solar energy on each of the nominated sites. As discussed below, several criteria were developed to inform the preliminary assessment. These include slope, solar resource availability, distance to transmission lines, interconnections and roads, and the presence of sensitive resources and/or potentially incompatible land use designations. This analysis provides a first-level screening to identify areas that merit further scrutiny for solar resource development.

## 4.1 SOLAR POWER CRITERIA DEVELOPMENT

The assessment adhered to a specific methodology outlined below. BLM utilized screening criteria based on past methodology developed by National Renewable Energy Laboratory (NREL) (DOE 2008) and adapted for specific issues and concerns with public land management, previously disturbed sites, and environmental conditions in Arizona. **Section 6**, References and Data Sets for GIS Screening, describes the data in further detail. The BLM reviewed high-potential site screening criteria from previous federal land renewable resource assessments. The screening criteria are presented in **Section 4.2**, Solar Power Assessment Methodology.

### 4.1.1 Utility and Distributed Generation

Solar energy projects can be categorized as utility or distributed, depending on several factors. Utility generation, also known as large-scale generation, ties into the power grid for distribution to off-site markets. As such, they are generally larger in capacity and can be located away from load centers. Distributed or small-scale generation produces power often used on-site or nearby. These

projects may not require transmission interconnection and the on-site or close proximity power consumption usually dictates that these projects be located near a load center.

The site profiles identify those sites within 10 miles of a load center as potential candidates for distributed or central generation projects. All other sites are noted for their potential suitability for central generation.

## 4.2 SOLAR POWER ASSESSMENT METHODOLOGY

Based on the review of potential assessment criteria, the following site characteristics and methodology were used to assess the suitability of a site for solar power energy development. This analysis does not differentiate between CSP and PV technologies. However, because available technology currently requires a large land area to be commercially viable, sites less than 100 acres are noted in the site profiles (see **Section 7**, Nominated Site Profiles) for their possible incompatibility with large-scale or central CSP projects.

### 4.2.1 Slope

Utilization of current solar development technology is limited to areas with a slope of five percent or less. For this assessment, sites where 100 percent of the land exhibits less than five percent slope receive 10 points, 90 to 99 percent receive 9 points, 80 to 89 percent receive 8 points, 70 to 79 percent receive 7 points, 60 to 69 percent receive 6 points, 50 to 59 percent receive 5 points, 40 to 49 percent receive 4 points, 30 to 39 percent receive 3 points, 20 to 29 percent receive 2 points, 10 to 19 percent receive 1 point, and 0 to 9 percent receive 0 points.

The weight factor of the slope in the overall scale is 25 percent.

### 4.2.2 Direct Solar Resource

CSP and PV technologies become viable at different direct solar resource intensities. PV systems require 5 $kWh/m^2/day$, but a level of 6.5 $kWh/m^2/day$ is necessary for CSP systems. Because all of the sites measure greater than 6.5 $kWh/m^2/day$, the solar resource rating is considered adequate for all of the nominated sites and all sites score the maximum 10 points.

The weight factor of solar resource ratings in the overall scale is 30 percent.

### 4.2.3 Distance to Transmission/Interconnections

The presence of transmission lines/interconnections in close proximity to the site lowers the time and cost necessary for site development. Values were assigned according to the sites' distance from existing transmission lines (ranging between 69-500 kilovolts [kV]). Sites less than or equal to five miles from transmission lines were assigned 10 points; 8 points for sites 6 to 10 miles; 6 points for sites 11 to 15 miles; 4 points for sites 16 to 20 miles; and 2 points for sites 21 to 25 miles. Sites located more than 25 miles from the nearest 69-500 kV line received 0 points.

The weight factor of distance to transmission line in the overall scale is 15 percent.

### 4.2.4 Distance to Roads

The presence of graded roads in close proximity to the site lowers the time and cost necessary for site development. Values were assigned according to the sites distance from graded roads. Sites less than 1 mile from graded roads were assigned 10 points; 8 points for sites 1 to 5 miles; 6 points for sites 6 to 10 miles; 4 points for sites 11 to 15 miles; and 2 points for sites 16 to 20 miles. Sites located more than 20 miles from the nearest graded road received 0 points.

The weight factor of distance to graded roads in the overall scale is 15 percent.

### 4.2.5 Sensitive Resources and Land Management

The presence of sensitive resources or incompatible land management designations can increase time and cost necessary to develop a site or prohibit development altogether. The nominated sites were screened for 12 criteria: Arizona Game and Fish Department (AZGFD) Species and Habitat Conservation Guide Conservation Potential, AZGFD big game habitat, AZGFD wildlife corridors, special status species habitat (including threatened and endangered species habitat), desert tortoise habitat, mapped wetlands, 100-year floodplains, sensitive soils, mining claims, access, adjacent land uses, and right-of-ways (ROW). In addition, sites located on BLM-administered land were screened for Visual Resource Management (VRM) Class I, II, and III classification; Special Recreation Management Area (SRMA) designation; and ROW exclusion or avoidance designations.

Site-specific information on cultural resources is not available for the nominated sites. BLM would comply with the National Historic Preservation Act (NHPA) in considering any applications to develop energy facilities on nominated sites on BLM-administered or leased land. Class I inventories (data searches) and, if needed, Class III field inventories would be conducted to identify any affected cultural resources. Most of the nominated sites have been disturbed to the extent that they likely do not contain intact cultural resources; this is particularly true for landfills and mines. In some cases, impacts to cultural resources may have been mitigated prior to the development of these facilities.

However, relatively undisturbed nominated sites or former agricultural areas could contain cultural resources or intact archaeological deposits. Historic mining features could be associated with modern mines. Potential effects on cultural resources in adjacent areas, or tribal concerns such as visual impacts or access issues relating to places of traditional importance, could raise issues that would need to be addressed through the Section 106 of the NHPA consultation process.

Developers will need to consult with the relevant agencies to determine the effect a criterion will have on their project; thus, the presence of one or more criterion is simply an indicator that additional consultation will likely be required.

Sites with 0 criteria received 10 points, sites with 1 criterion received 8 points, sites with 2 criteria received 6 points, sites with 3 criteria received 4 points, sites with 4 criteria received 2 points, and sites with 5 or more criteria received 0 points.

The weight factor of sensitive resources in the overall scale is 15 percent.

## 4.3 RESULTS

**Table 4-1**, Solar Potential Screening Results, shows the scoring of each nominated site by criterion and by total score.

**Table 4-1**
**Solar Potential Screening Results**

| Site | | Characteristics Inputs | | | | | Criteria Evaluation Values | | | | | Weighted Scores per Criteria | | | | | Total Score (out of 100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Slope (% of site exhibiting <5% slope) | Direct Solar Resource (kWh/m²/day) | Distance to Transmission (Miles) | Distance to Road (Miles) | Sensitive Resources and Land Management (# of sensitive resources) | Slope | Direct Solar Resource | Distance to Transmission | Distance to Road | Sensitive Resources and Land Management | Slope (25%) | Direct Solar Resource (30%) | Distance to Transmission (15%) | Distance to Road (15%) | Sensitive Resources and Land Management (15%) | |
| 1 | 19th Street Landfill | 98 | 6.5 | 1 | <1 | 3 | 9 | 10 | 10 | 10 | 4 | 22.5 | 30 | 15 | 15 | 6 | **88.5** |
| 2 | Belmont CAP | 99 | 6.5 | 5 | <1 | 3 | 9 | 10 | 10 | 10 | 4 | 22.5 | 30 | 15 | 15 | 6 | **88.5** |
| 3 | Belmont Proposed Disposal | 96 | 6.5 | 0 | 1 | 4 | 9 | 10 | 10 | 8 | 2 | 22.5 | 30 | 15 | 12 | 3 | **82.5** |
| 4 | Black Canyon City Landfill | 100 | 6.5 | 0 | <1 | 3 | 10 | 10 | 10 | 10 | 4 | 25 | 30 | 15 | 15 | 6 | **91** |
| 5 | Black Rock Gypsum Mine | 31 | 6.5 | 0 | <1 | 2 | 3 | 10 | 10 | 10 | 6 | 7.5 | 30 | 15 | 15 | 9 | **76.5** |
| 6 | Bouse Hills CAP | 78 | 6.5 | 8 | <1 | 1 | 7 | 10 | 8 | 10 | 8 | 17.5 | 30 | 12 | 15 | 12 | **86.5** |
| 7 | Brady Central CAP | 100 | 6.5 | 7 | 1 | 3 | 10 | 10 | 8 | 8 | 4 | 25 | 30 | 12 | 12 | 6 | **85** |
| 8 | Brady Wash Pipeline | 71 | 6.5 | 5 | 1 | 7 | 7 | 10 | 10 | 8 | 0 | 17.5 | 30 | 15 | 12 | 0 | **74.5** |
| 9 | Butler Valley | 98 | 6.5 | 0 | 1 | 2 | 9 | 10 | 10 | 8 | 6 | 22.5 | 30 | 15 | 12 | 9 | **88.5** |
| 10 | Cave Creek 2 | 100 | 6.5 | 0 | 1 | 2 | 10 | 10 | 10 | 8 | 6 | 25 | 30 | 15 | 12 | 9 | **91** |
| 11 | Cave Creek Landfill | 100 | 6.5 | 1 | 1 | 3 | 10 | 10 | 10 | 8 | 4 | 25 | 30 | 15 | 12 | 6 | **88** |
| 12 | Chevron Vacant Land | 97 | 6.5 | 0 | 3 | 6 | 9 | 10 | 10 | 8 | 0 | 22.5 | 30 | 15 | 12 | 0 | **79.5** |
| 13 | Christmas Mine | 0 | 6.5 | 5 | <1 | 4 | 0 | 10 | 10 | 10 | 2 | 0 | 30 | 15 | 15 | 3 | **0** |
| 14 | Copperstone Mine | 81 | 6.5 | 9 | <1 | 3 | 8 | 10 | 8 | 10 | 4 | 20 | 30 | 12 | 15 | 6 | **83** |
| 15 | Cordes Lakes Hazmat | 14 | 6.5 | 1 | <1 | 5 | 1 | 10 | 10 | 10 | 0 | 2.5 | 30 | 15 | 15 | 0 | **62.5** |
| 16 | Dateland Gravel Pit | 41 | 6.5 | 1 | <1 | 1 | 4 | 10 | 10 | 10 | 8 | 10 | 30 | 15 | 15 | 12 | **82** |
| 17 | Detrital Wash | 95 | 6.5 | 0 | <1 | 2 | 9 | 10 | 10 | 10 | 6 | 22.5 | 30 | 15 | 15 | 9 | **91.5** |
| 18 | Dog Town Mine | 91 | 6.5 | 0 | <1 | 4 | 9 | 10 | 10 | 10 | 2 | 22.5 | 30 | 15 | 15 | 3 | **85.5** |

**Table 4-1**
**Solar Potential Screening Results**

| Site | | Characteristics Inputs | | | | | Criteria Evaluation Values | | | | | Weighted Scores per Criteria | | | | | Total Score (out of 100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Slope (% of site exhibiting <5% slope) | Direct Solar Resource (kWh/m²/day) | Distance to Transmission (Miles) | Distance to Road (Miles) | Sensitive Resources and Land Management (# of sensitive resources) | Slope | Direct Solar Resource | Distance to Transmission | Distance to Road | Sensitive Resources and Land Management | Slope (25%) | Direct Solar Resource (30%) | Distance to Transmission (15%) | Distance to Road (15%) | Sensitive Resources and Land Management (15%) | |
| 19 | Empire Farms | 100 | 6.5 | 0 | <1 | 2 | 10 | 10 | 10 | 10 | 6 | 25 | 30 | 15 | 15 | 9 | **94** |
| 20 | Florence-Price Dump | 100 | 6.5 | 0 | <1 | 5 | 10 | 10 | 10 | 10 | 0 | 25 | 30 | 15 | 15 | 0 | **85** |
| 21 | Foothills Proposed Disposal | 55 | 6.5 | 0 | <1 | 3 | 5 | 10 | 10 | 10 | 4 | 12.5 | 30 | 15 | 15 | 6 | **78.5** |
| 22 | Forepaugh Airport | 100 | 6.5 | 0 | <1 | 2 | 10 | 10 | 10 | 10 | 6 | 25 | 30 | 15 | 15 | 9 | **94** |
| 23 | Fredonia Landfill | 86 | 6.5 | 4 | <1 | 3 | 8 | 10 | 10 | 10 | 4 | 20 | 30 | 15 | 15 | 6 | **86** |
| 24 | Fredonia OHV Area | 49 | 6.5 | 3 | <1 | 4 | 4 | 10 | 10 | 10 | 2 | 10 | 30 | 15 | 15 | 3 | **73** |
| 25 | Granite Hill Landing Strip | 91 | 6.5 | 4 | <1 | 4 | 9 | 10 | 10 | 10 | 2 | 22.5 | 30 | 15 | 15 | 3 | **85.5** |
| 26 | Harcuvar Substation | 100 | 6.5 | 0 | <1 | 3 | 10 | 10 | 10 | 10 | 4 | 25 | 30 | 15 | 15 | 6 | **91** |
| 27 | Harquahala CAP | 100 | 6.5 | 0 | <1 | 0 | 10 | 10 | 10 | 10 | 10 | 25 | 30 | 15 | 15 | 15 | **100** |
| 28 | Harrison Road | 15 | 6.5 | 6 | <1 | 4 | 1 | 10 | 8 | 10 | 2 | 2.5 | 30 | 12 | 15 | 3 | **62.5** |
| 29 | Hartman Wash Mine | 1 | 6.5 | 1 | 1 | 7 | 0 | 10 | 10 | 8 | 0 | 0 | 30 | 15 | 12 | 0 | **57** |
| 30 | Hassayampa Landfill | 89 | 6.5 | 3 | <1 | 2 | 8 | 10 | 10 | 10 | 6 | 20 | 30 | 15 | 15 | 9 | **89** |
| 31 | Hassayampa CAP | 99 | 6.5 | 0 | <1 | 1 | 9 | 10 | 10 | 10 | 8 | 22.5 | 30 | 15 | 15 | 12 | **94.5** |
| 32 | Irvington | 69 | 6.5 | 6 | 1 | 2 | 6 | 10 | 8 | 8 | 6 | 15 | 30 | 12 | 12 | 9 | **78** |
| 33 | Jones Private Property | 100 | 6.5 | 13 | <1 | 3 | 10 | 10 | 6 | 10 | 4 | 25 | 30 | 9 | 15 | 6 | **85** |
| 34 | La Osa Surface Disturbance | 100 | 6.5 | 1 | <1 | 4 | 10 | 10 | 10 | 10 | 2 | 25 | 30 | 15 | 15 | 3 | **88** |
| 35 | Litchfield Park Urban Parcel | 100 | 6.5 | 0 | <1 | 1 | 10 | 10 | 10 | 10 | 8 | 25 | 30 | 15 | 15 | 12 | **97** |

**Table 4-1**
**Solar Potential Screening Results**

| Site | | Characteristics Inputs | | | | | Criteria Evaluation Values | | | | | Weighted Scores per Criteria | | | | | Total Score (out of 100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Slope (% of site exhibiting <5% slope) | Direct Solar Resource (kWh/m²/day) | Distance to Transmission (Miles) | Distance to Road (Miles) | Sensitive Resources and Land Management (# of sensitive resources) | Slope | Direct Solar Resource | Distance to Transmission | Distance to Road | Sensitive Resources and Land Management | Slope (25%) | Direct Solar Resource (30%) | Distance to Transmission (15%) | Distance to Road (15%) | Sensitive Resources and Land Management (15%) | |
| 36 | Little Harquahala CAP Site | 82 | 6.5 | 4 | <1 | 3 | 8 | 10 | 10 | 10 | 4 | 20 | 30 | 15 | 15 | 6 | **86** |
| 37 | Los Reales | 91 | 6.5 | 3 | <1 | 3 | 9 | 10 | 10 | 10 | 4 | 22.5 | 30 | 15 | 15 | 6 | **88.5** |
| 38 | Mobile Proposed Disposal | 98 | 6.5 | 0 | <1 | 2 | 9 | 10 | 10 | 10 | 6 | 22.5 | 30 | 15 | 15 | 9 | **91.5** |
| 39 | Mokaac Gravel Pit | 98 | 6.5 | 0 | <1 | 3 | 9 | 10 | 10 | 10 | 4 | 22.5 | 30 | 15 | 15 | 6 | **88.5** |
| 40 | Old Yuma County FUP | 96 | 6.5 | 2 | <1 | 2 | 9 | 10 | 10 | 10 | 6 | 22.5 | 30 | 15 | 15 | 9 | **91.5** |
| 41 | Page Landfill | 100 | 6.5 | 0 | <1 | 1 | 10 | 10 | 10 | 10 | 8 | 25 | 30 | 15 | 15 | 12 | **97** |
| 42 | Prudence | 67 | 6.5 | 10 | <1 | 2 | 6 | 10 | 8 | 10 | 6 | 15 | 30 | 12 | 15 | 9 | **81** |
| 43 | Quartzsite Area | 98 | 6.5 | 3 | <1 | 4 | 9 | 10 | 10 | 10 | 2 | 22.5 | 30 | 15 | 15 | 3 | **85.5** |
| 44 | Red Gap Ranch | 100 | 6.5 | 0 | <1 | 0 | 10 | 10 | 10 | 10 | 10 | 25 | 30 | 15 | 15 | 15 | **100** |
| 45 | Red Rocks CAP | 99 | 6.5 | 0 | <1 | 6 | 9 | 10 | 10 | 10 | 0 | 22.5 | 30 | 15 | 15 | 0 | **82.5** |
| 46 | Ryan | 100 | 6.5 | 5 | <1 | 2 | 10 | 10 | 10 | 10 | 6 | 25 | 30 | 15 | 15 | 9 | **94** |
| 47 | Ryland | 100 | 6.5 | 2 | <1 | 5 | 10 | 10 | 10 | 10 | 0 | 25 | 30 | 15 | 15 | 0 | **85** |
| 48 | Saginaw-Valhalla-Snyder Mine Quarry | 86 | 6.5 | 0 | <1 | 4 | 8 | 10 | 10 | 10 | 2 | 20 | 30 | 15 | 15 | 9 | **83** |
| 49 | Saginaw Hill | 86 | 6.5 | 0 | <1 | 1 | 8 | 10 | 10 | 10 | 8 | 20 | 30 | 15 | 15 | 12 | **92** |
| 50 | San Xavier Mine | 85 | 6.5 | 1 | <1 | 3 | 8 | 10 | 10 | 10 | 4 | 20 | 30 | 15 | 15 | 6 | **86** |
| 51 | Silver Creek Landfill | 18 | 6.5 | 0 | <1 | 4 | 1 | 10 | 10 | 10 | 2 | 2.5 | 30 | 15 | 15 | 3 | **65.5** |
| 52 | Silverbell | 100 | 6.5 | 0 | <1 | 3 | 10 | 10 | 10 | 10 | 4 | 25 | 30 | 15 | 15 | 4 | **91** |
| 53 | Snowflake Mine | 29 | 6.5 | 2 | <1 | 3 | 2 | 10 | 10 | 10 | 4 | 5 | 30 | 15 | 15 | 6 | **71** |

**Table 4-1**
**Solar Potential Screening Results**

| Site | | Characteristics Inputs | | | | | Criteria Evaluation Values | | | | | Weighted Scores per Criteria | | | | | Total Score (out of 100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Slope (% of site exhibiting <5% slope) | Direct Solar Resource (kWh/m²/day) | Distance to Transmission (Miles) | Distance to Road (Miles) | Sensitive Resources and Land Management (# of sensitive resources) | Slope | Direct Solar Resource | Distance to Transmission | Distance to Road | Sensitive Resources and Land Management | Slope (25%) | Direct Solar Resource (30%) | Distance to Transmission (15%) | Distance to Road (15%) | Sensitive Resources and Land Management (15%) | |
| 54 | Snyder Hill Mine | 86 | 6.5 | 0 | <1 | 2 | 8 | 10 | 10 | 10 | 6 | 20 | 30 | 15 | 15 | 9 | **89** |
| 55 | Sonoita Landfill | 92 | 6.5 | 9 | <1 | 3 | 9 | 10 | 8 | 10 | 4 | 22.5 | 30 | 12 | 15 | 6 | **85.5** |
| 56 | St. Mary's | 100 | 6.5 | 1 | <1 | 3 | 10 | 10 | 10 | 10 | 4 | 25 | 30 | 15 | 15 | 6 | **91** |
| 57 | Tombstone Landfill | 77 | 6.5 | 0 | <1 | 3 | 7 | 10 | 10 | 10 | 4 | 17.5 | 30 | 15 | 15 | 6 | **83.5** |
| 58 | Torrez-Brant | 100 | 6.5 | 3 | <1 | 1 | 10 | 10 | 10 | 10 | 8 | 25 | 30 | 15 | 15 | 12 | **97** |
| 59 | Tumamoc | 33 | 6.5 | 0 | <1 | 3 | 3 | 10 | 10 | 10 | 4 | 7.5 | 30 | 15 | 15 | 6 | **73.5** |
| 60 | Twin Peaks-Sandrio CAP | 98 | 6.5 | 0 | <1 | 3 | 9 | 10 | 10 | 10 | 4 | 22.5 | 30 | 15 | 15 | 6 | **88.5** |
| 61 | Valhalla | 86 | 6.5 | 0 | <1 | 1 | 8 | 10 | 10 | 10 | 8 | 20 | 30 | 15 | 15 | 12 | **92** |
| 62 | Vincent Mullins | 47 | 6.5 | 9 | <1 | 3 | 4 | 10 | 8 | 10 | 4 | 10 | 30 | 12 | 15 | 6 | **73** |
| 63 | White Sage Gravel Pits | 44 | 6.5 | 0 | <1 | 1 | 4 | 10 | 10 | 10 | 8 | 10 | 30 | 15 | 15 | 12 | **82** |
| 64 | Wildcat Hill | 96 | 6.5 | 0 | <1 | 1 | 9 | 10 | 10 | 10 | 8 | 22.5 | 30 | 15 | 15 | 12 | **94.5** |

# SECTION 5
# WIND SITE ASSESSMENT

The following preliminary site assessment evaluates the suitability of utility and community wind power technologies on the 64 nominated sites. Results of the wind assessments are provided in **Section 5.3**, Results.

The general goal of the analysis is to provide a preliminary assessment of the overall potential for developing wind energy on each of the nominated sites. As discussed below, several criteria were developed to support the preliminary assessment. These include slope, wind resource availability, distance to transmission lines, interconnections and roads, and the presence of sensitive resources and/or potentially incompatible land use designations. This analysis provides a first-level screening to identify areas that merit further scrutiny for wind resource development.

Wind power can be well-suited to disturbed or previously disturbed land, due to the widespread availability of the resource and the flexibility in the size and number of turbines that can be installed. Wind turbines can be described by the class of the resource they use to operate. Community wind turbines operate with Class 3 wind, range in size from 50 to 750 kW, and are typically used for non-grid-connected, distributed generation. Utility-scale turbines use Class 4 or higher wind, typically range in size from 750 kW to 2.5 MW, and are used for grid-connected "utility" generation. While small wind turbines theoretically could be grid-connected, and a single large wind turbine could be installed and used for remote power generation, such configurations would not be the least-cost option.

A preliminary site assessment has been carried out by BLM to evaluate the suitability of community and utility wind technologies on the 64 nominated sites. The assessment was based on general topographic and property size suitability, wind potential rating, maximum potential MW output, distribution lines accessible for interconnecting to the grid, distance to different types of load

centers, as well as potential sensitive resources issues. The general goal of the analysis is to provide a preliminary assessment of the overall potential for developing community or utility-scale wind energy stations on each of the 64 nominated sites.

## 5.1 COMMUNITY WIND ASSESSMENT METHODOLOGY

Community wind is intended for small-scale power generation applications and may or may not be interconnected with the power grid. Community wind does not always require a large footprint or power grid or road access. Based on the review of potential assessment criteria, the following site characteristics and methodology were used to assess the suitability of a site for community wind energy development.

### 5.1.1 Slope

Utilization of current wind energy technology is limited to areas with a slope of 15 percent or less. For this assessment, sites where 100 percent of the land exhibits less than 15 percent slope receive 10 points, 90 to 99 percent receive 9 points, 80 to 89 percent receive 8 points, 70 to 79 percent receive 7 points, 60 to 69 percent receive 6 points, 50 to 59 percent receive 5 points, 40 to 49 percent receive 4 points, 30 to 39 percent receive 3 points, 20 to 29 percent receive 2 points, 10 to 19 percent receive 1 point, and 0-9 percent receive 0 points.

The weight factor of the slope in the overall scale is 25 percent.

### 5.1.2 Wind Resource Class

Wind resource availability is critical to project viability. Using wind resource class GIS data produced by NREL, sites were assigned a wind potential rating and corresponding score. Areas defined as Class 6, Outstanding (over 600 watts/m$^2$), received 10 points; areas defined as Class 5, Excellent (500 to 600 watts/m$^2$), received 8 points; Class 4, Good (400 to 500 watts/m$^2$) areas received 6 points; and areas assigned Class 3, Fair (300 to 400 watts/m$^2$), given 4 points. Sites scoring less than Fair were automatically excluded from receiving a wind potential rating. Only three sites have a wind potential rating of Fair and no sites are rated higher than Fair.

The weight factor of wind potential rating in the overall scale is 30 percent.

Community wind site screening may be more acutely impacted by microclimates that may improve or decrease the wind resource.

### 5.1.3 Distance to Transmission/ Interconnections

The presence of transmission lines/interconnections in close proximity to the site lowers the time and cost necessary for site development. Values were assigned according to the sites' distance from existing transmission lines (ranging between 69-500 kV). Sites less than or equal to 5 miles from transmission lines were assigned 10 points; 8 points for sites 6 to 10 miles; 6 points for sites 11 to

15 miles; 4 points for sites 16 to 20 miles; and 2 points for sites 21 to 25 miles. Sites located more than 25 miles from the nearest 69-500 kV line received 0 points.

The weight factor of distance to transmission line in the overall scale is 10 percent.

The distance to transmission lines is not weighted as heavily as for utility wind because community wind can be utilized for on-site or neighboring site power needs, obviating the need to interconnect with the power grid.

### 5.1.4 Distance to Load Center

Community wind projects are best-suited for distribution to on-site or nearby load centers because of the scale at which they operate. Values were assigned according to the sites' distance to a potential load center. Sites with onsite or adjacent load centers were assigned 10 points; 8 points for sites 1 to 2 miles; 6 points for sites 3 to 4 miles; 4 points for sites 5 to 6 miles; and 2 points for sites 7 to 8 miles. Sites located more than 8 miles from a potential load center received 0 points.

Distances were estimated using satellite imagery and the weight factor of distance to load center in the overall scale is 10 percent.

### 5.1.5 Sensitive Resources and Land Management

The presence of sensitive resources or incompatible land management designations can increase time and cost necessary to develop a site or prohibit development altogether. The nominated sites were screened for 12 criteria: AZGFD Species and Habitat Conservation Guide Conservation Potential, AZGFD big game habitat, AZGFD wildlife corridors, special status species habitat (including threatened and endangered species habitat), desert tortoise habitat, mapped wetlands, 100-year floodplains, sensitive soils, mining claims, access, adjacent land uses, and ROWs. In addition, sites located on BLM-administered land were screened for VRM Class I, II, and III classification; SRMA designation; and ROW exclusion or avoidance designations. Developers will need to consult with the relevant agencies to determine the effect a criterion will have on their project; thus, the presence of one or more criterion is simply an indicator that additional consultation will likely be required.

Because smaller sites are used for community wind, the developer may have fewer mitigation options when sensitive resources are present. As such, this criterion is weighted more heavily than for utility wind.

Sites with 0 criteria received 10 points, sites with 1 criterion received 8 points, sites with 2 criteria received 6 points, sites with 3 criteria received 4 points, sites with 4 criteria received 2 points, and sites with 5 or more criteria received 0 points.

The weight factor of sensitive resources in the overall scale is 25 percent.

## 5.2 UTILITY WIND ASSESSMENT METHODOLOGY

Utility wind is intended for larger-scale, grid-connected power generation applications and, thus, should have a footprint of at least 50 acres and be within 25 miles to transmission and graded roads. This section discusses site characteristics used to assess the suitability of a site for utility wind energy technology development.

### 5.2.1 Area

Sites with less than 50 acres of developable land are considered infeasible for utility wind development and receive 0 points. Sites with more than 50 acres of developable land receive a full 10 points. The weight factor of the area in the overall scale is 10 percent.

### 5.2.2 Slope

Utilization of current wind energy technology is limited to areas with a slope of 15 percent or less. For this assessment, sites where 100 percent of the land exhibits less than 15 percent slope receive 10 points, 90 to 99 percent receive 9 points, 80 to 89 percent receive 8 points, 70 to 79 percent receive 7 points, 60 to 69 percent receive 6 points, 50 to 59 percent receive 5 points, 40 to 49 percent receive 4 points, 30 to 39 percent receive 3 points, 20 to 29 percent receive 2 points, 10 to 19 percent receive 1 point, and 0 to 9 percent receive 0 points.

The weight factor of the slope in the overall scale is 20 percent.

### 5.2.3 Wind Resource Class

Wind resource availability is critical to project viability. Using wind resource class GIS data produced by NREL, sites were assigned a wind potential rating and corresponding score. Areas defined as Class 6, Outstanding (over 600 watts/m$^2$), were assigned 10 points; areas defined as Class 5, Excellent (500 to 600 watts/m$^2$), were assigned 8 points; Class 4, Good (400 to 500 watts/m$^2$) areas were assigned 6 points; and areas assigned Class 3, Fair (300 to 400 watts/m$^2$), were assigned 4 points. Sites scoring less than Fair were automatically excluded from receiving a wind potential rating. The weight factor of wind potential rating in the overall scale is 25 percent.

### 5.2.4 Distance to Transmission/ Interconnections

The presence of transmission lines/interconnections in close proximity to the site lowers the time and cost necessary for site development. Values were assigned according to the sites' distance from existing transmission lines (ranging between 69-500 kV). Sites less than or equal to 5 miles from transmission lines were assigned 10 points; 8 points for sites 6-10 miles; 6 points for sites 11-15 miles; 4 points for sites 16-20 miles; and 2 points for sites 21-25 miles. Sites located more than 25 miles from the nearest 69-500 kV line received 0 points.

The weight factor of distance to transmission line in the overall scale is 15 percent.

### 5.2.5 Distance to Roads

The presence of graded roads in close proximity to the site lowers the time and cost necessary for site development. Values were assigned according to the sites distance from graded roads. Sites less than or equal to 5 miles from graded roads were assigned 10 points; 8 points for sites 6 to 10 miles; 6 points for sites 11 to 15 miles; 4 points for sites 16 to 20 miles; and 2 points for sites 21 to 25 miles. Sites located more than 25 miles from the nearest graded road received 0 points.

The weight factor of distance to graded roads in the overall scale is 15 percent.

### 5.2.6 Sensitive Resources and Land Management

The presence of sensitive resources or incompatible land management designations can increase time and cost necessary to develop a site or prohibit development altogether. The nominated sites were screened for 12 criteria: AZGFD Species and Habitat Conservation Guide Conservation Potential, AZGFD big game habitat, AZGFD wildlife corridors, special status species habitat (including threatened and endangered species habitat), desert tortoise habitat, mapped wetlands, 100-year floodplains, sensitive soils, mining claims, access, adjacent land uses, and ROWs. In addition, sites located on BLM-administered land were screened for VRM Class I, II, and III; SRMA designations; and ROW exclusion or avoidance designations. Developers will need to consult with the relevant agencies to determine the effect a criterion will have on their project; thus, the presence of one or more criterion is simply an indicator that additional consultation will likely be required.

Sites with 0 criteria received 10 points, sites with 1 criterion received 8 points, sites with 2 criteria received 6 points, sites with 3 criteria received 4 points, sites with 4 criteria received 2 points, and sites with 5 or more criteria received 0 points.

The weight factor of sensitive resources in the overall scale is 15 percent.

## 5.3 RESULTS

Only three of the nominated sites have any wind resource potential: Brady Wash Pipeline (6-acre portion), Red Gap Ranch (1,700-acre portion), and Silver Creek Landfill (11-acre portion) are all rated "Fair." The small number of suitable acres at Brady Wash Pipeline and Silver Creek Landfill likely eliminate them from consideration for utility wind. Under the scoring system for community wind, those sites receive 39.5 and 37.5 points, respectively. Red Gap Ranch receives 60 points for community wind and 76 points for utility wind. No other nominated sites are considered ideal for wind energy development because they lack an adequate wind resource class.

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# SECTION 6
# REFERENCES AND DATA SETS FOR GIS SCREENING

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## 6.2 DATA SETS FOR GIS SCREENING

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# SECTION 7
# NOMINATED SITE PROFILES

## 7.1 INTRODUCTION

Based on an extensive public outreach process, the BLM and public identified 64 previously disturbed sites on federal, (including BLM-administered), state, municipal, and private lands (refer to **Figure 1-1**, RDEP Nominated Sites and **Table 1-1**, RDEP Nominated Site Summaries) that may potentially be suitable for renewable energy development. Site types include gravel pits, mine sites, landfills, isolated parcels that have been disturbed, marginal or impaired agricultural lands, abandoned unauthorized airstrips, and CAP ROW. These 64 sites are not an exhaustive list, as there may be other disturbed lands in the state; however, they serve as a reasonable sample to understand the potential issues associated with reuse for renewable power on disturbed lands.

Detailed *Nominated Site Profiles* for each site are provided in this section and include the following information:

- Location facts, including site size, location, previous land use, adjacent land use(s), and surface and mineral ownership;
- Site characteristics, including solar and wind potential rating, estimated solar and wind generation capacity, developable acres, distance to graded roads, distance to transmission interconnections, and groundwater;
- Select environmental factors, including those for wildlife, vegetation, sensitive or listed species, wetlands, hydrology, special designations, land use, etc.;
- Site opportunities and constraints;
- Suggested remediation and restoration requirements; and
- Summary describing the overall potential of the site for renewable energy development.

These profiles are intended to provide a preliminary indication of whether or not a particular site is suitable for solar or wind energy development. Although these sites have been identified as previously disturbed sites, the overall context of the site's location is considered in determining the site's characteristics, and opportunities and constraints. For example, a site profile may list critical habitat as an environmental factor; indicating that, although the site is disturbed, it may contain critical habitat on portions of the sites. Environmental factors and site constraints do not necessarily indicate that a site is unsuitable for development but that a developer should be aware of these factors as they plan for a project.

The information contained within each site profile has been created to give an overview of each site and is not a guarantee of a site's suitability for energy development. Developers should consult with appropriate government agencies and undertake further research before making a final determination on a site's suitability for their project(s).

# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #1

**Name:**
**19th Avenue Landfill**

**Facts:**

**Acres:** 191

**County:** Maricopa

**Previous Land Use:** Landfill

**Adjacent Land Use**: Industrial, undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.1N, R.3E, sec. 19, Lots 1-3, E2NW, NESW

0 — 100

**Solar Score: 88.5**

0 — 100

**Community Wind Score**

0 — 100

**Utility Wind Score**

**Estimated Maximum Potential Capacity**[1]

**Solar: 24 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 191 |
| Slope <5% | 188 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 1 mile |
| 115kV | 3 miles |
| 230kV | 1 miles |
| 500kV | 2 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- In an urban area
- Special status species
- Adjacent to Salt River channel
- AZGFD Conservation Potential area

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

DRAFT

**Disclaimer**: Nominated Sites Summary Sheets are intended to provide a preliminary indication of whether or not a particular site is suitable for solar or wind energy development. The information contained within this site summary has been created to give an overview of each site and is not a guarantee of a site's suitability for energy development. Developers should consult with appropriate government agencies and undertake further research before making a final determination on a site's suitability for their project(s).

# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

# SITE #1

## Remediation/Restoration Requirements

The 19th Avenue Landfill was on the National Priorities List until 2006 when it was deleted. The EPA and the State of Arizona (through ADEQ) determined at that time that all appropriate response actions under CERCLA had been completed. Operation and maintenance and five year reviews continue at the Site. This deletion does not preclude future actions under Superfund. While nearby underground storage tanks and leaking underground storage tanks are present, none are expected to contribute to contamination at or near the surface of the project site since the surface is a soil cap above surface grade underlain by a thick layer of solid waste. Likewise, none of the other area Superfund sites are expected to contribute contamination to the Site.

On-going remediation requirements may limit the type and location of solar and wind energy facilities. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 24 MW solar energy facility would fit on the 188 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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**Disclaimer:** Nominated Sites Summary Sheets are intended to provide a preliminary indication of whether or not a particular site is suitable for solar or wind energy development. The information contained within this site summary has been created to give an overview of each site and is not a guarantee of a site's suitability for energy development. Developers should consult with appropriate government agencies and undertake further research before making a final determination on a site's suitability for their project(s).

# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #2

**Solar Score: 88.5**

**Community Wind Score: 0**

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 104 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Desert Tortoise habitat
* Arizona Game and Fish Department Conservation Potential
* Managed as VRM Class III
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## Name:
## Belmont Mountain CAP

**Facts:**

**Acres:** 841

**County:** Maricopa

**Previous Land Use:** Bureau of Reclamation ROW

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** Bureau of Reclamation

**Mineral Ownership:** Federal

**Legal Description:** T.3N., R.7W., sec. 23, 24, 26, 27 (partial sections), T.3N., R.6W sec 15,16,17,18,19,20,21 (partial sections).

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 841 |
| Slope <5% | 830 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 7 miles |
| 115kV | 32 miles |
| 230kV | 5 miles |
| 500kV | 6 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Managed as VRM Class III
- Desert tortoise habitat
- Arizona Game and Fish Department Conservation Potential
- AZGFD Conservation Potential area

DRAFT

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# SITE #2

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 104 MW solar energy facility would fit on the 830 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

This site is located within desert tortoise habitat and developers should consult with the BLM and the USFWS regarding potential mitigation and compliance measures.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

These lands were originally surveyed under the NEPA process before construction of the Central Arizona Project (CAP). This includes areas identified by Reclamation as wildlife habitat areas ("green-up" areas) to be managed as mitigation for impacts from the CAP construction. Use of such areas would require consideration of mitigation for losses of wildlife habitat.

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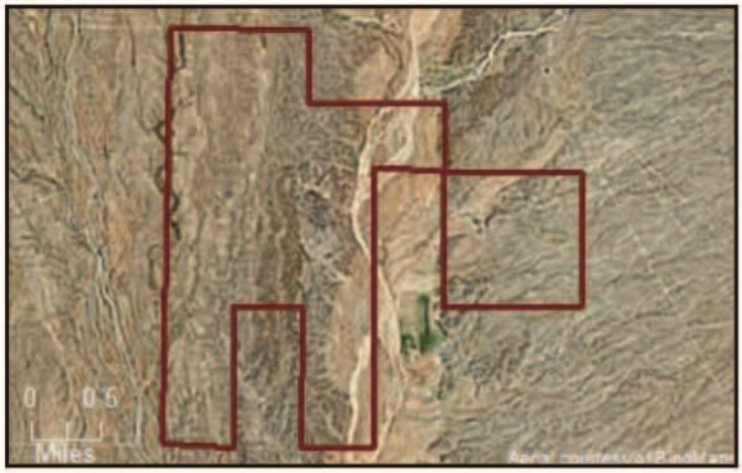
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #3




**Name:**
**Belmont Proposed Disposal**

**Facts:**

**Acres:** 3,174

**County:** Maricopa

**Previous Land Use:** Undeveloped

**Adjacent Land Use:** Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.3N., R.5W., sec. 22, All; sec. 23, S2; sec. 25, all; sec. 26, W2; sec. 77 all; sec. 34, W2; sec. 35, W2.

0 — 100

**Solar Score: 82.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 397 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* 360 acres of site identified as FEMA 100-year floodplain
* River or wash runs through site area
* Access may be hampered by surrounding private lands

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 3,174 |
| Slope <5% | 3,037 acres |
| Distance to Graded Road | 1-2 miles |
| Distance to Transmission Interconnection: | |
| 69kV | 13 miles |
| 115kV | 23 miles |
| 230kV | 0 miles |
| 500kV | 2 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- River or wash runs through site area
- 360 acres of site identified as FEMA 100-year floodplain
- Site is close to a load center
- Site is identified for disposal by BLM

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# SITE #3

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 397 MW solar energy facility would fit on the 3,174 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

A portion of this site lies within a 100-year floodplain and is likely unsuitable for development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #4

**Name:**
**Black Canyon City Landfill**

**Facts:**

**Acres:** 25

**County:** Yavapai

**Previous Land Use:** Landfill

**Adjacent Land Use:** Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** n/a

**Legal Description:** T.8N., R.2E., sec. 1

0 — 100

**Solar Score: 91**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity[1]**

**Solar: 3.1 MW** **Wind: None**

## Site Opportunities

- Entire site has slope of <5%
- Site is close to transmission lines and roads
- Site is close to a load center

## Site Constraints

- Desert tortoise habitat
- AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 25 |
| Slope <5% | 25 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 10 miles |
| 115kV | 36 miles |
| 230kV | 2 miles |
| 500kV | 0 miles |
| Active Management Area | No |

### Selected Environmental Factors

- AZGFD Conservation Potential area
- Desert tortoise Habitat

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# SITE #4

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 3.1 MW solar energy facility would fit on the 25 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #5

**Name:**
**Black Rock Gypsum Mine**

**Facts:**

**Acres:** 679

**County:** La Paz

**Previous Land Use:** Mine

**Adjacent Land Use**: BLM-owned; wilderness and state lands

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N., R.12W.; T.41N., R.13W.

0 100

**Solar Score: 76.5**

0 100

**Community Wind Score:**

0 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 26 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 679 |
| Slope <5% | 210 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 98 miles |
| 115kV | 164 miles |
| 230kV | 110 miles |
| 500kV | 0.1 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Mountainous area with significant washes
- Special Status Species habitat
- Special Recreation Management Area

## Site Opportunities

* Site is close to transmission lines and roads

## Site Constraints

* Only 31 percent of site has slope of <5%
* Special Recreation Management Area
* Special Status Species Habitat

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# SITE #5

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 26 MW solar energy facility would fit on the 210 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site is located within a Special Recreation Management Area, which may place limitations on development. Developers should consult with the BLM to determine allowable uses in this area.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #6

**Name:**
**Bouse Hills CAP**

**Facts:**

**Acres:** 120

**County:** La Paz

**Previous Land Use:** CAP right-of-way

**Adjacent Land Use**: CAP sites and undeveloped land

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7N., R.16W., sec. 9, E2; sec. 10, W2.

**Nominated By:** CAP

0 100

**Solar Score: 86.5**

0 100

**Community Wind Score:**

0 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 11.8 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Desert tortoise habitat

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 120 |
| Slope <5% | 94 |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 22 miles |
| 115kV | 17 miles |
| 230kV | 8 miles |
| 500kV | 30 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Canal on site
- Desert tortoise habitat
- Site is close to a load center

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# SITE #6

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

An 11.8 MW solar energy facility would fit on the 94 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV technology. CSP development may become feasible as technology improves.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

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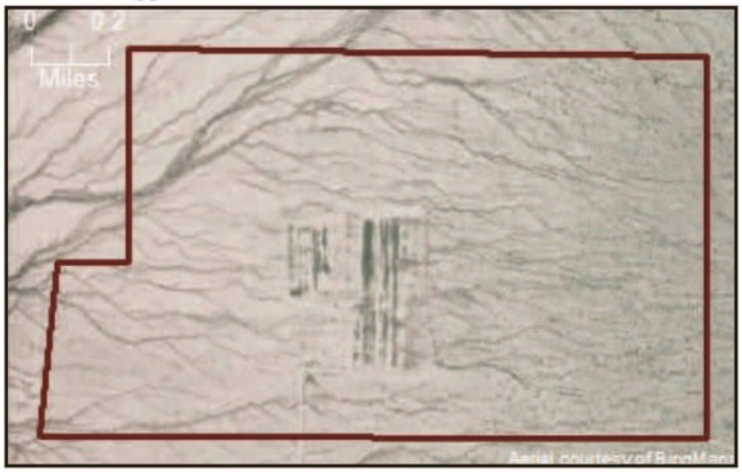
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #7




**Name:**
**Brady CAP Site**

**Facts:**

**Acres:** 1,023

**County:** Pinal

**Previous Land Use:** CAP; reconveyed lands

**Adjacent Land Use**: CAP site;, undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7S., R.9E., sec. 3, lots 1-4, S2N2, S2; sec. 4, lots 1-2, S2NE, S2.

0 — 100

**Solar Score: 85**

0 — 100

**Community Wind Score:**

0 — 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 128 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* AZGFD big game habitat
* Topography related to borrow pit activities

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 1,023 |
| Slope <5% | 1,023 acres |
| Distance to Graded Road | 1-2 miles |
| Distance to Transmission Interconnection: | |
| 69kV | 35 miles |
| 115kV | 7 miles |
| 230kV | 11 miles |
| 500kV | 19 miles |
| Active Management Area | Yes |

## Selected Environmental Factors

- Multiple streams and/or washes present
- AZGFD big game habitat
- Active Management Area
- Site is close to a load center

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# SITE #7

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

The Brady Pumping Plant is a hazardous waste generator. No spills have been reported.

## Site Summary

A 128 MW solar energy facility would fit on the 1,023 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP or PV technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

Portions of this site were previously used as a borrow pit during construction of the CAP canal. These areas may require restoration prior to construction of solar energy projects.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #8

**Solar Score: 74.5**

**Community Wind Score: 39.5**

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 289 MW** **Wind: 0.2 MW**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads

## Site Constraints

* Active Management Area
* Special Status Species habitat (2,700 acres)
* Managed as VRM Class III
* Desert tortoise habitat
* AZGFD big game habitat
* Grazing leases

## Name:
## Brady Wash Pipeline

**Facts:**

**Acres:** 3,240

**County:** Pinal

**Previous Land Use:** Utility Corridor

**Adjacent Land Use**: BLM

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7S., R.13E., sec. 3, S2; sec. 4, Lots 1-4, S2N2, S2; sec. 5, Lots 1-4, S2N2, S2; sec. 8, W2; sec. 17, all; sec. 22, All.

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | Fair |
| | (6 acres ) |
| Acres | 3,240 |
| Slope <5% | 2,310 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 54 miles |
| 115kV | 7 miles |
| 230kV | 25 miles |
| 500kV | 5 miles |
| Active Management Area | Yes |

**Selected Environmental Factors**

- Managed as VRM Class III
- AZGFD big game habitat
- Special Status Species habitat (2,700 acres)
- Desert tortoise habitat
- Site is identified for disposal by BLM

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# SITE #8

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 289 MW solar energy facility would fit on the 2,310 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology. With six acres rated as "fair" for wind potential, this site could be a candidate for community wind generation.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

Grazing occurs on this site, and would require termination of the lease or mitigation to minimize impacts to grazing operations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #9

**Name:**
**Butler Valley**

**Facts:**

**Acres:** 83,013

**County:** La Paz

**Previous Land Use:** Agricultural

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** State

**Mineral Ownership:** State

**Legal Description:** T.7N., R13W; T.7N., R14W; T.7N., R15W; T.8N, R13W; T.8N, R14W

0 — 100

**Solar Score: 88.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 10,214 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Special Status Species habitat (7,440 acres)
* Desert tortoise habitat (13,100 acres)

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 83,013 |
| Slope <5% | 81,710 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 22 miles |
| 115kV | 21 miles |
| 230kV | 0 miles |
| 500kV | 25 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Potential mining claims
- Desert tortoise habitat (13,100 acres)
- Special Status Species habitat (7,440 acres)

DRAFT

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# SITE #9

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 10,214 MW solar energy facility would fit on the 81,710 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #10

**Name:**
**Cave Creek 2**

**Facts:**

**Acres:** 68

**County:** Maricopa

**Previous Land Use:** Landfill

**Adjacent Land Use**: Recreational, residential, undeveloped

**Surface Ownership:** State

**Mineral Ownership:** State

**Legal Description:** T.5N., R.3E., sec. 12, E2SE, SENE.

0 100

**Solar Score: 91**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 8.5 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 68 |
| Slope <5% | 68 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 2 miles |
| 115kV | 20 miles |
| 230kV | 0.4 miles |
| 500kV | 13 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Near load center
- Active Management Area
- Near transmission lines and roads

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Potentially incompatible adjacent land uses

DRAFT

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# SITE #10

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

An 8.5 MW solar energy facility would fit on the 68 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

This location is known to be near sensitive cultural resources. Documentation of the cultural resources would be required and avoidance of impacts to these areas would be considered in reviewing any applications for development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #11

**Name:**
**Cave Creek Landfill**

**Facts:**

**Acres:** 42

**County:** Maricopa

**Previous Land Use:** Landfill

**Adjacent Land Use**: Recreational, residential, undeveloped

**Surface Ownership:** n/a

**Mineral Ownership:** n/a

**Legal Description:** T.5N., R.4E., sec. 7, Lots 5-12

0 100

**Solar Score: 88**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 5.3 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Potentially incompatible adjacent land uses
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 42 |
| Slope <5% | 42 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 2 mile |
| 115kV | 21 miles |
| 230kV | 1 mile |
| 500kV | 13 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Near load center
- Active Management Area
- Near transmission lines and roads
- AZGFD Conservation Potential area

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# SITE #11

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 5.3 MW solar energy facility would fit on the 42 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

This location is known to be near sensitive cultural resources. Documentation of the cultural resources would be required and avoidance of impacts to these areas would be considered in reviewing any applications for development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #12

**Name:**
**Chevron Vacant Land**

**Facts:**

**Acres:** 7,812

**County:** Pinal

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** n/a

**Legal Description:** Township 07 South, Range 12 East, Sec. 21-23, 25-29, 31, and 33 – 35.

0 100

**Solar Score: 79.5**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 948 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads

## Site Constraints

* Active Management Area
* AZGFD big game habitat
* Desert tortoise habitat (6,780 acres)
* Mining claims and road and pipeline ROWs present
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 7812 |
| Slope <5% | 7586 acres |
| Distance to Graded Road | 3-4 miles |
| Distance to Transmission Interconnection: | |
| 69kV | 46 miles |
| 115kV | 0 miles |
| 230kV | 17 miles |
| 500kV | 10 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- AZGFD big game habitat
- Desert tortoise habitat (6,780 acres)
- Mining claims and road and pipeline ROWs present
- Site is identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #12

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 948 MW solar energy facility would fit on the 7,586 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP or PV technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #13

**Name:**
**Christmas Mine**

**Facts:**

**Acres:** 496

**County:** Gila

**Previous Land Use:** Mine

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** n/a

**Legal Description:** n/a

0 100

**Solar Score: 0***

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

* Because this site has 0 acres with < 5% slope, it is considered undevelopable with current technology.

**Estimated Maximum Potential Capacity**[1]

**Solar: None** **Wind: None**

## Site Opportunities

* Solar potential rating of Good on entire site
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Little or no flat terrain
* Desert tortoise habitat
* Special Status Species habitat
* AZGFD big game habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | None |
| Wind Potential | None |
| Acres | 496 |
| Slope <5% | 0 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 77 miles |
| 115kV | 5 miles |
| 230kV | 22 miles |
| 500kV | 16 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Mining claims present
- Mountainous area
- Desert tortoise Habitat
- Special Status Species habitat
- AZGFD big game habitat
- AZGFD Conservation Potential area

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# SITE #13

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

A leaking underground storage tank (LUST) exists approximately 0.8 mile to the southeast of the site boundary. Due to the distance from the site and the rugged topography between the LUST and the site, no contamination at the site from the LUST is expected.

On-going remediation requirements may limit the type and location of solar and wind energy facilities. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

Because this site does not exhibit land with a slope of <5 percent, solar energy generation would be difficult.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

Developers should consult with mineral estate owner/administrator regarding the potential for existing mining claims that could limit renewable energy development.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #14

**Name:**
**Copperstone Mine**

**Facts:**

**Acres:** 929

**County:** La Paz

**Previous Land Use:** Gold mine

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.6N., R.20W., sec. 12, S2; sec. 13, NE.

0 100

**Solar Score: 83**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 94 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to roads
* Site is close to a load center

## Site Constraints

* Special Status Species habitat
* Mining claims and ROWs present
* Managed as VRM Class III
* Sensitive soils

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 929 |
| Slope <5% | 750 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 30 miles |
| 115kV | 9 miles |
| 230kV | 24 miles |
| 500kV | 18 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Mining claims and ROWs present
- Managed as VRM Class III
- Special Status Species habitat (240 acres)
- Sensitive soils

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# SITE #14

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 94 MW solar energy facility would fit on the 750 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Developers should consult with mineral estate owner/administrator regarding the potential for existing mining claims that could limit renewable energy development. In addition, there may be ROWs on-site. Developers should contact land managers and ROW-holders to determine the nature of on-site ROWs and what, if any, restrictions they may pose.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Soil properties on this site may restrict renewable energy development. Some soil types require additional engineering requirements to support solar or wind energy infrastructure foundations. Further research through the property owner/administrator and USDA NRCS is recommended.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #15

**Name:**
**Cordes Lakes Hazmat Site**

**Facts:**

**Acres:** 14

**County:** Yavapai

**Previous Land Use:** Hazmat site

**Adjacent Land Use**: Residential, undeveloped, transportation

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.11N., R.2E., sec. 23, Lots 25, 28.

0 — 100

**Solar Score: 62.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score:**

0 — 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 0.3 MW** **Wind: None**

## Site Opportunities

* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* ROW present
* Special Status Species habitat
* AZGFD big game habitat
* Managed as VRM Class III
* Potentially incompatible adjacent land uses
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 14 |
| Slope <5% | 2 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 27 miles |
| 115kV | 27 miles |
| 230kV | 1 mile |
| 500kV | 2 miles |
| Active Management Area | No |

### Selected Environmental Factors

- ROW present
- Managed as VRM Class III
- AZGFD big game habitat
- Special Status Species habitat
- AZGFD Conservation Potential area

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# SITE #15

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 0.3 MW solar energy facility would fit on the 2 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be ROWs on-site. Developers should contact land managers and ROW-holders to determine the nature of on-site ROWs and what, if any, restrictions they may pose.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #16

**Name:**
**Dateland Gravel Pit**

**Facts:**

**Acres:** 64

**County:** Yuma

**Previous Land Use:** Mineral materials site

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7S., R.12W, sec. 21, SW1/4; sec. 28, NW1/4.

0 100

**Solar Score: 82**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 3.3 MW** **Wind: None**

## Site Opportunities

* Site is close to transmission lines and roads

## Site Constraints

* Only 41% of site exhibits slopes < 5 percent
* Active Management Area
* Special Status Species Habitat

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 64 |
| Slope <5% | 26 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 19 miles |
| 115kV | 56 miles |
| 230kV | 1 mile |
| 500kV | 9 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Mining claim present
- Special Status Species habitat
- Near transmission lines and roads

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# SITE #16

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 3.3 MW solar energy facility would fit on the 26 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #17

**Name:**
**Detrital Wash**

**Facts:**

**Acres:** 17,695

**County:** Mohave

**Previous Land Use:** Detrital wash

**Adjacent Land Use**: NPS, BLM, BOR lands; near reservation; adjacent to Mohave Wind Project

**Surface Ownership:** State

**Mineral Ownership:** State

**Legal Description:** T.28N., R.21W.; T.29N., R.21W.; T.29N., R.20W.

0 — 100

**Solar Score: 91.5**

0 — 100

**Community Wind Score:**

0 — 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 2,104 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Minimal environmental constraints

## Site Constraints

* Special Status Species habitat (6,270 acres)
* Washes on site

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 17,695 |
| Slope <5% | 16,828 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 42 miles |
| 115kV | 109 miles |
| 230kV | 37 miles |
| 500kV | 0 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Washes on site
- Special Status Species habitat (6,270 acres)

DRAFT

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# SITE #17

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 2,104 MW solar energy facility would fit on the 16,828 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site contains 6,270 acres of habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #18

**Name:**
**DogTown Mine**

**Facts:**

**Acres:** 2,080

**County:** Pima

**Previous Land Use:** Mine

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** State

**Legal Description:** T.17S., R.12E., sec. 10

**Solar Score: 85.5**

**Community Wind Score: 0**

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 237 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Mining claims present
* Managed as VRM Class III
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 2,080 |
| Slope <5% | 1,892 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 30 miles |
| 115kV | 0.2 miles |
| 230kV | 2 miles |
| 500kV | 43 miles |
| Active Management Area | Yes |

## Selected Environmental Factors

- Mining claims present
- Managed as VRM Class III
- Special Status Species habitat
- Site is close to transmission lines and roads
- Part of site identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #18

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 237 MW solar energy facility would fit on the 1,892 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP or PV technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Developers should consult with mineral estate owner/administrator regarding the potential for existing mining claims that could limit renewable energy development.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #19

**Name:**
**Empire Farms**

**Facts:**

**Acres:** 682

**County:** Pinal

**Previous Land Use:** Agricultural

**Adjacent Land Use**: Residential, undeveloped

**Surface Ownership:** State

**Mineral Ownership:** State

**Legal Description:** T.3S., R.8E., sec. 7, E2; sec. 8, SW, W2NW; sec. 18, lot 1.

0 — 100
**Solar Score: 94**

0 — 100
**Community Wind Score: 0**

0 — 100
**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 85 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat (570 acres)
* Potentially incompatible adjacent land uses

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 682 |
| Slope <5% | 682 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 10 miles |
| 230kV | 0 miles |
| 500kV | 10 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Special Status Species habitat (570 acres)

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# SITE #19

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks (USTs) at the site or within a quarter mile of its boundaries. The nearest UST is at approximately 0.3 mile to the northwest along West Hunt Highway. No leaks are reported. The nearest portion of the farm is at the same elevation (i.e. neither upgradient nor downgradient) as the UST. The central portion of the farm is slightly downgradient from the UST, but given the gentle slope and the distance to that part of the farm is 0.7 mile, as well as no reports of leakage, it is considered unlikely that there would be any groundwater contamination from this UST.

Soils in agricultural lands may contain harmful pesticides, necessitating the need for soil testing and potential remediation. Pesticides and other contaminants can be released during construction and other ground-disturbing activities.

## Site Summary

An 85 MW solar energy facility would fit on the 682 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #20

**Name:**
**Florence-Price Dump**

**Facts:**

**Acres:** 85

**County:** Pinal

**Previous Land Use:** Landfill

**Adjacent Land Use**: Neighboring National Guard use in sec. 17

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.4S., R.10E., sec. 19, lots 2-3, N2NE, E2NW, NESW.

0 — 100

**Solar Score: 85**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 10.6 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat
* Managed as VRM Class III
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 85 |
| Slope <5% | 85 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 47 miles |
| 115kV | 0.3 miles |
| 230kV | 9 miles |
| 500kV | 14 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Managed as VRM Class III
- Special Status Species habitat
- Site is identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #20

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 10.6 MW solar energy facility would fit on the 85 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #21

**Name:**
**Foothills Proposed Disposal**

**Facts:**

**Acres:** 1,355

**County:** Maricopa

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Undeveloped, rural residential, transportation

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.1N., R.4W.

0 — 100

**Solar Score: 78.5**

0 — 100

**Community Wind Score:**

0 — 100

**Utility Wind Score:**

**Estimated Maximum Potential Capacity**[1]

**Solar: 94 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 1,355 |
| Slope <5% | 749 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 4 miles |
| 115kV | 19 miles |
| 230kV | 0 miles |
| 500kV | 0 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Mining claims present
- Special Status Species habitat (870 acres)
- Near transmission lines and roads
- Site is identified for disposal by BLM

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# SITE #21

## Remediation/Restoration Requirements

A search of federal and state records indicates one underground storage tank (UST) at the southeast corner of the site. Since no leaks have been reported and the UST is downgradient from the adjacent portions of the site, no contamination at the site from this UST is expected. There are no other indications of present or past contamination or presence of USTs within a quarter mile of its boundaries.

## Site Summary

A 94 MW solar energy facility would fit on the 749 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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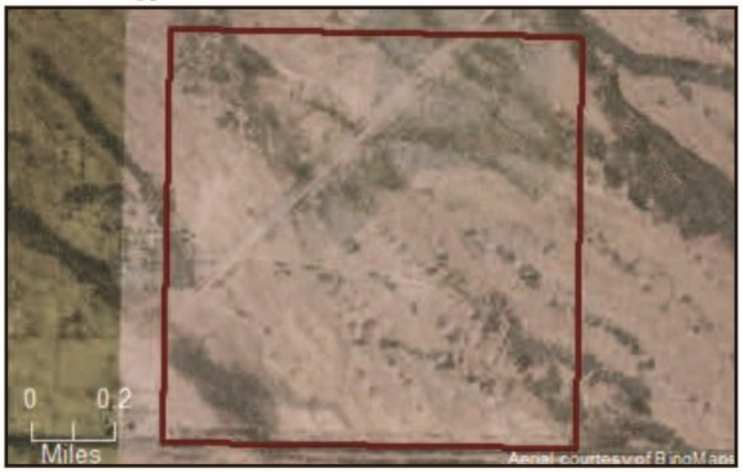
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #22




**Name:**
**Forepaugh Airport**

**Facts:**

**Acres:** 635

**County:** Maricopa

**Previous Land Use:** Airport

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** n/a

**Legal Description:** T.7N., R.7W., sec. 16, all.

0 100

**Solar Score: 94**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 79 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* AZGFD wildlife corridor

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 635 |
| Slope <5% | 635 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0 miles |
| 115kV | 42 miles |
| 230kV | 10 miles |
| 500kV | 1 mile |
| Active Management Area | No |

### Selected Environmental Factors

- AZGFD wildlife corridor
- Site is near transmission lines and roads
- Site is identified for disposal by BLM

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# SITE #22

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 79 MW solar energy facility would fit on the 635 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site is part of a wildlife corridor identified by the AZGFD and provides important habitat connectivity for certain species. Consultation with AZGFD will help determine the affected species and any necessary mitigation measures.

This location is known to be near sensitive cultural resources. Documentation of the cultural resources would be required and avoidance of impacts to these areas would be considered in reviewing any applications for development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #23

**Name:**
**Fredonia Landfill**

**Facts:**

**Acres:** 21

**County:** Coconino

**Previous Land Use:** Landfill

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N., R.2W., sec. 22, N2NWNE, N2NENW.

0 — 100

**Solar Score: 86**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 2.3 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 21 |
| Slope <5% | 18 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 45 miles |
| 115kV | 160 miles |
| 230kV | 48 miles |
| 500kV | 4 miles |
| Active Management Area | No |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* ROW Present
* Special Status Species Habitat
* Special Recreation Management Area
* Managed as VRM Class III

## Selected Environmental Factors

- ROW present
- Managed as VRM Class III
- Special Recreation Management Area
- Special Status Species habitat
- Sensitive soils
- Site is identified for disposal by BLM

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# SITE #23

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks (USTs) at the site or within a quarter mile of its boundaries. There is one UST and one leaking UST within one mile of the site boundary, but both are downgradient from the landfill.

On-going remediation requirements may limit the type and location of solar and wind energy facilities. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 2.3 MW solar energy facility would fit on the 18 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be ROWs on-site. Developers should contact land managers and ROW-holders to determine the nature of on-site ROWs and what, if any, restrictions they may pose.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site is located within a Special Recreation Management Area, which may place limitations on development. Developers should consult with the BLM to determine allowable uses in this area.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #24

**Name:**
**Fredonia OHV Area**

**Facts:**

**Acres:** 348

**County:** Coconino

**Previous Land Use:** OHV recreation area

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N., R.2W., sec. 22, All.

0 — 100

**Solar Score: 73**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 21 MW** **Wind: None**

## Site Opportunities

* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Managed as VRM Class III
* Special Status Species habitat
* Special Recreation Management Area
* Sensitive soils
* Only 49 percent of site exhibits slopes <5 percent

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 348 |
| Slope <5% | 170 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 45 miles |
| 115kV | 160 miles |
| 230kV | 47 miles |
| 500kV | 3 miles |
| Active Management Area | No |

## Selected Environmental Factors

- Managed as VRM Class III
- Special Recreation Management Area
- Site is near transmission lines and roads
- Special Status Species habitat
- Sensitive soils
- Site is identified for disposal by BLM

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# SITE #24

## Remediation/Restoration Requirements

A search of federal and state records indicate the presence of one leaking underground storage tank 0.3 mile to the west of the southern edge of the site and an underground storage tank 0.2 mile from to the southwest. The Fredonia OHV area is at a higher elevation than both of these sites and would not receive contaminated groundwater flows from them. No other indications of past or present contamination is present.

## Site Summary

A 21 MW solar energy facility would fit on the 170 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site is located within a Special Recreation Management Area, which may place limitations on development. Developers should consult with the BLM to determine allowable uses in this area.

Soil properties on this site may restrict renewable energy development. Some soil types require additional engineering requirements to support solar or wind energy infrastructure foundations. Further research through the property owner/administrator and USDA NRCS is recommended.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #25

**Name:**
**Granite Hill Landing Strip**

**Facts:**

**Acres:** 2,656

**County:** Pinal

**Previous Land Use:** Landing strip

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7S., R.10E.

0 — 100

**Solar Score: 85.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 301 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 2,656 |
| Slope <5% | 2,406 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 37 miles |
| 115kV | 4 miles |
| 230kV | 13 miles |
| 500kV | 15 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Mining claims present
* Special Status Species habitat (1,990 acres)
* AZGFD big game habitat
* Desert tortoise habitat (1,020 acres)
* Managed as VRM Class III
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## Selected Environmental Factors

- Mining claims present
- Site is near transmission lines and roads
- Managed as VRM Class III
- AZGFD big game habitat
- Special Status Species habitat (1,990 acres)
- Site is identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #25

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 301 MW solar energy facility would fit on the 2,406 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

Developers should consult with mineral estate owner/administrator regarding the potential for existing mining claims that could limit renewable energy development.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

This site is located partially within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #26

**Name:**
**Harcuvar Substation**

**Facts:**

**Acres:** 59

**County:** La Paz

**Previous Land Use:** Substation, transmission lines

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7N, R.12W, Sec. 17 NE1/4, NW 1/4 and Sec. 20 SE 1/4, SW 1/4.

0 — 100

**Solar Score: 91**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 7.4 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads

## Site Constraints

* Desert tortoise habitat
* Special Status Species habitat
* Managed as VRM Class III

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 59 |
| Slope <5% | 59 |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 20 miles |
| 115kV | 39 miles |
| 230kV | 0 miles |
| 500kV | 26 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Site is near transmission lines and roads
- Managed as VRM Class III
- Special Status Species habitat
- Desert tortoise habitat
- AZGFD Conservation Potential area

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# SITE #26

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 7.4 MW solar energy facility would fit on the 59 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #27

**Name:**
**Harquahala CAP**

**Facts:**

**Acres:** 1,910

**County:** La Paz and Maricopa

**Previous Land Use:** Bureau of Reclamation ROW

**Adjacent Land Use**: Undeveloped, Interstate 10

**Surface Ownership:** Bureau of Reclamation

**Mineral Ownership:** Federal

**Legal Description:** T. 3N., R.11W., sec. 15, 16, 21, 22, 23, 24 (partial sections) T. 3N., R.10W., sec 19, 20, 21,

0 100

**Solar Score: 100**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 239 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Initial GIS screening did not identify potential site constraints. More detailed screening and site visits or surveys may identify constraints.

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 1,910 |
| Slope <5% | 1,910 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 25 miles |
| 115kV | 55 miles |
| 230kV | 19 miles |
| 500kV | 0 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Site is close to a load center
- Site is close to transmission lines and roads

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# SITE #27

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 239 MW solar energy facility would fit on the 1,910 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

These lands were originally surveyed under the NEPA process before construction of the Central Arizona Project (CAP). This includes areas identified by Reclamation as wildlife habitat areas ("green-up" areas) to be managed as mitigation for impacts from the CAP construction. Use of such areas would require consideration of mitigation for losses of wildlife habitat.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #28

**Name:**
**Harrison Road**

**Facts:**

**Acres:** 65

**County:** Pima

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential, undeveloped

**Surface Ownership:** Private; State

**Mineral Ownership:** Private; State

**Legal Description:** T.14S., R.15E., sec. 34, SE.

0 — 100

**Solar Score: 62.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.3 MW** **Wind: None**

## Site Opportunities

* Site is close to roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species habitat
* Potentially incompatible adjacent land uses
* Only 15 percent of site exhibits slopes <5 percent
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 65 |
| Slope <5% | 10 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 19 miles |
| 115kV | 9 miles |
| 230kV | 9 miles |
| 500kV | 32 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Special Management Area
- Near urban area
- Special Status Species habitat
- Potentially incompatible adjacent land uses
- AZGFD Conservation Potential area

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# SITE #28

## Remediation/Restoration Requirements

Remedial action at old landfills normally includes capping of the waste, managing landfill leachate and gas, and monitoring the impact on the environment.

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks (USTs) at the site or within a quarter mile of its boundaries. The Davis Monthan Air Force Base Superfund site is directly across Irvington Avenue to the south of the Harrison Road site. From an inspection of aerial photography, these lands appear undeveloped except for a few dirt trails. Groundwater flow in the area is generally toward the northwest. None of the upgradient lands seem to have any development on them that would be related to the specific concerns related to the Superfund site.

The Garigan property is listed as a CERCLIS site, but EPA has no information on the nature of the site. Groundwater flow at the Garigan site is expected to be to the north-northeast and away from the Harrison Landfill.

## Site Summary

A 1.3 MW solar energy facility would fit on the 10 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #29

**Name:**
**Hartman Wash Mine**

**Facts:**

**Acres:** 678

**County:** Maricopa

**Previous Land Use:** Mine

**Adjacent Land Use**: BLM site

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.7N., R.6W., sec. 27, N2, SW, N2SE, SWSE; sec. 34, N2NW.

0 — 100

**Solar Score: 57**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.3 MW** **Wind: None**

## Site Opportunities

* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Mining claim present
* Special Status Species habitat
* Managed as VRM Class II
* Desert tortoise habitat
* AZGFD wildlife corridor
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 678 |
| Slope <5% | 10 acres |
| Distance to Graded Road | 1-2 miles |
| Distance to Transmission Interconnection: | |
| 69kV | 1 mile |
| 115kV | 40 miles |
| 230kV | 11 miles |
| 500kV | 3 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Mining claim present
- Managed as VRM Class II
- Special Status Species habitat
- AZGFD wildlife corridor
- Desert tortoise habitat
- Site is identified for disposal by BLM
- AZGFD Conservation Potential area

DRAFT

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# SITE #29

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 1.3 MW solar energy facility would fit on the 10 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

Developers should consult with mineral estate owner/administrator regarding the potential for existing mining claims that could limit renewable energy development.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

The site is part of a wildlife corridor identified by the AZGFD and provides important habitat connectivity for certain species. Consultation with AZGFD will help determine the affected species and any necessary mitigation measures.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #30

**Name:**
**Hassayampa Landfill**

**Facts:**

**Acres:** 9

**County:** Maricopa

**Previous Land Use:** Landfill

**Adjacent Land Use**: Industrial, undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private, state

**Legal Description:** T.1S., R.5W., sec. 3, S2

0 100

**Solar Score: 89**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 9 |
| Slope <5% | 8 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 6 miles |
| 115kV | 29 miles |
| 230kV | 9 miles |
| 500kV | 3 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Site is near transmission lines and roads
- Special Status Species habitat
- Near load center

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# SITE #30

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past underground storage tanks at the site or within a quarter mile of its boundaries.

As of 1986, on-site monitoring wells were contaminated with chlorinated organic solvents, including 1,1,1-trichloroethane and trichloroethylene, according to tests conducted by the Arizona Department of Health Services (ADHS). At that time, contamination had not been detected in off-site wells. The landfill was then listed on the NPL in 1987. Cleanup actions were initiated in 1994 and completed in 1997. The site has not yet been deleted from the NPL. Supporting maps and reports are attached.

Since cleanup work has been completed at the site, but the site has not been removed from the NPL, it is possible that residual groundwater contamination with the above-mentioned substances is present. Soil vapors may be present during construction activities, and vapor intrusion into the landfill may be present. Coordination with the EPA and AZDEQ is recommended before construction activity at the site.

## Site Summary

A 1 MW solar energy facility would fit on the 8 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #31

**Name:**
**Hassayampa CAP**

**Facts:**

**Acres:** 723

**County:** Maricopa

**Previous Land Use:** Bureau of Reclamation ROW

**Adjacent Land Use**: Undeveloped, Residential

**Surface Ownership:** Bureau of Reclamation

**Mineral Ownership:** Federal

**Legal Description:** T. 4N., R.4W. Sec. 13, 21, 22, 23, 24 (partial sections).

0 100

**Solar Score: 94.5**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 90 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 723 |
| Slope <5% | 720 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 8 miles |
| 115kV | 20 miles |
| 230kV | 1 miles |
| 500kV | 0 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Near urban area
* Special status species habitat

## Selected Environmental Factors

- Site is close to a load center
- Special Status Species habitat

DRAFT

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# SITE #31

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 720 MW solar energy facility would fit on the 720 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

These lands were originally surveyed under the NEPA process before construction of the Central Arizona Project (CAP). This includes areas identified by Reclamation as wildlife habitat areas ("green-up" areas) to be managed as mitigation for impacts from the CAP construction. Use of such areas would require consideration of mitigation for losses of wildlife habitat.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #32

**Name:**
**Irvington**

**Facts:**

**Acres:** 13

**County:** Pima

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential, undeveloped

**Surface Ownership:** Private, state

**Mineral Ownership:** Private, state

**Legal Description:** T.15S., R.15E., sec. 2, Lot 2

0 — 100

**Solar Score: 78**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.1 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat
* Potentially incompatible adjacent land uses

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 13 |
| Slope <5% | 9 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 18 miles |
| 115kV | 8 miles |
| 230kV | 9 miles |
| 500kV | 33 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Near urban area
- Special Status Species habitat
- Site is close to transmission lines and roads

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# SITE #32

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks (USTs) at the site. The nearest USTs are at 0.2, 0.35 and 0.4 mile to the northeast. There are no leaking USTs within 0.5 mile of the site. Davis Monthan Air Force Base, a Superfund site, is 0.5 mile to the west. Groundwater flow in the area is generally toward the north; none of the aforementioned sites would impact groundwater at the Irvington Landfill.

Global Solar Energy, located 0.8 mile to the southeast and upgradient from the Irvington site, has a record of releasing lead to underground wells and to an onsite landfill during years 2003 through 2006. Lead could be present in groundwater underlying the Irvington Landfill but would not be a concern since a thick layer of solid waste and a soil cap is presumed to overly such groundwater. Also, lead in groundwater does not pose an inhalation hazard as it is not a volatile compound.

## Site Summary

A 1.1 MW solar energy facility would fit on the 9 acres of land with a slope of <5%. Size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #33

**Name:**
**Jones Private Property**

**Facts:**

**Acres:** 156

**County:** Cochise

**Previous Land Use:** Agricultural

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private; State

**Legal Description:** T.24S., R.22E., sec. 16, NW.

0 — 100
**Solar Score: 85**

0 — 100
**Community Wind Score: 0**

0 — 100
**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 19.5 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to a load center

## Site Constraints

* Special Status Species habitat
* AZGFD big game habitat
* Distance to transmission interconnect
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 156 |
| Slope <5% | 156 acres |
| Distance to Graded Road | 1-2 miles |
| Distance to Transmission Interconnection: | |
| 69kV | 14 miles |
| 115kV | 14 miles |
| 230kV | 13 miles |
| 500kV | 100 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Potential mining claims
- AZGFD big game habitat
- Special Status Species habitat
- AZGFD Conservation Potential area

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# SITE #33

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 19.5 MW solar energy facility would fit on the 156 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The distance to transmission lines may make interconnection less cost-efficient.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #34

**Name:**
**La Osa Surface Disturbance**

**Facts:**

**Acres:** 41

**County:** Pinal

**Previous Land Use:** n/a

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.15S., R.12E., sec. 17, SWSE.

0 — 100

**Solar Score: 88**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 5.1 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat (24 acres)
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 41 |
| Slope <5% | 41 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 26 miles |
| 115kV | 8 miles |
| 230kV | 1 mile |
| 500kV | 8 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- AZGFD Conservation Potential area
- Special Status Species habitat (24 acres)

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# SITE #34

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 5.1 MW solar energy facility would fit on the 41 acres of land with a slope of <5%. Size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

This location is known to be near sensitive cultural resources. Documentation of the cultural resources would be required and avoidance of impacts to these areas would be considered in reviewing any applications for development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #35

**Name:**
**Litchfield Park Urban Parcel**

**Facts:**

**Acres:** 41

**County:** Maricopa

**Previous Land Use:** Disturbed area

**Adjacent Land Use**: Industrial, undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.2.N., R.1W., sec. 13, SWSE; sec. 24, NWNE; sec. 25, NWNE.

0 100

**Solar Score: 97**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 5.1 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 41 |
| Slope <5% | 41 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 3 miles |
| 115kV | 3 miles |
| 230kV | 0 miles |
| 500kV | 7 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Rights of way present
- Part of site identified for disposal by BLM

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# SITE #35

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 5.1 MW solar energy facility would fit on the 41 acres of land with a slope of <5%. Size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #36

**Solar Score: 86**

**Community Wind Score: 86**

**Utility Wind Score: 86**

**Estimated Maximum Potential Capacity**[1]

**Solar: 16.4 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Minimal environmental constraints

## Site Constraints

* Desert tortoise habitat
* Managed as VRM Class III
* CAP pumping station located on site
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## Name:
## Little Harquahala CAP Site

**Facts:**

**Acres:** 159

**County:** La Paz

**Previous Land Use:** CAP ROW

**Adjacent Land Use**: Arizona Canal, undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.3N., R.13W., sec. 18, Lots 3-4, SE, E2SW; sec. 19, Lots 1-2, NE, E2NW.

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 159 |
| Slope <5% | 131 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 35 miles |
| 115kV | 43 miles |
| 230kV | 24 miles |
| 500kV | 4 miles |
| Active Management Area | No |

### Selected Environmental Factors

- ROW present
- Managed as VRM Class III
- Desert tortoise Habitat
- Canal on site
- AZGFD Conservation Potential area

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# SITE #36

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 16.4 MW solar energy facility would fit on the 131 acres of land with a slope of <5%. Size of developable acreage would likely make the site suitable for PV or CSP technology.

This site is located within desert tortoise habitat and developers should consult with the BLM and the USFWS regarding potential mitigation and compliance measures.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

A CAP pumping station is located on the site and may inhibit development of portions of tis site.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #37

**Name:**
**Los Reales**

**Facts:**

**Acres:** 248

**County:** Pima

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential, commercial, undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private; State

**Legal Description:** T.15S., R.14E., sec. 23, N2.

0 — 100

**Solar Score: 88.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 28 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 248 |
| Slope <5% | 225 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 21 mile |
| 115kV | 3 miles |
| 230kV | 6 miles |
| 500kV | 34 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat
* Potentially incompatible adjacent land uses

## Selected Environmental Factors

- Active Management Area
- Near urban area and load center
- Special Status Species habitat

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# SITE #37

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 28 MW solar energy facility would fit on the 225 acres of land with a slope of <5%. Size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.
The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #38

**Name:**
**Mobile Proposed Disposal**

**Facts:**

**Acres:** 2,843

**County:** Maricopa

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Unknown

**Legal Description:** T.4S., R.1E., sec. 34, E2; sec. 35, W2

0 — 100

**Solar Score: 91.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 347 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 2,843 |
| Slope <5% | 2,776 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 27 mile |
| 115kV | 12 miles |
| 230kV | 13 miles |
| 500kV | 0 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Includes 570 acres of AZGFD wildlife corridors

## Selected Environmental Factors

- Rights-of-way present
- Active Management Area
- Partially within AZGFD wildlife corridors
- Site is identified for disposal by BLM

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# SITE #38

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of USTs at the site or within a quarter mile of its boundaries.

## Site Summary

A 347 MW solar energy facility would fit on the 2,776 acres of land with a slope of <5%. Size of developable acreage would likely make the site suitable for PV or CSP technology.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site is part of a wildlife corridor identified by the AZGFD and provides important habitat connectivity for certain species. Consultation with AZGFD will help determine the affected species and any necessary mitigation measures.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #39

**Name:**
**Mokaac Gravel Pit**

**Facts:**

**Acres:** 80

**County:** Mohave

**Previous Land Use:** Gravel pit

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N., R.12W., sec. 23, W2SW

0 100

**Solar Score: 88.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 9.8 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 80 |
| Slope <5% | 78 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 97 miles |
| 115kV | 164 miles |
| 230kV | 107 miles |
| 500kV | 0.1 miles |
| Active Management Area | No |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads

## Site Constraints

* Special Recreation Management Area
* Special Status Species Habitat
* Site has 17 acres managed as VRM Class II

## Selected Environmental Factors

- Right-of-ways present
- Portion of site managed as VRM Class II
- Special Recreation Management Area
- Special Status Species

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# SITE #39

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 9.8 MW solar energy facility would fit on the 78 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #40

**Name:**
**Old Yuma County FUP Site**

**Facts:**

**Acres:** 27

**County:** Yuma

**Previous Land Use:** Mineral Material

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** BLM

**Legal Description:** T.8S., R.14W., sec. 7, NW.

0 — 100

**Solar Score: 91.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 3.3 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads

## Site Constraints

* Managed as VRM Class II and III
* Special Recreation Management Area
* ROW exclusion or avoidance area

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 27 |
| Slope <5% | 26 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 30 miles |
| 115kV | 42 miles |
| 230kV | 2 miles |
| 500kV | 5 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Managed as VRM Class II and III
- Special Recreation Management Area
- ROW exclusion or avoidance area

DRAFT

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# SITE #40

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 3.3 MW solar energy facility would fit on the 26 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

This site is located within a ROW exclusion or avoidance area. As such, ROWs may be restricted or prohibited. Developers should consult with the BLM to determine the feasibility of ROW development on this site.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #41

**Name:**
**Page Landfill**

**Facts:**

**Acres:** 160

**County:** Coconino

**Previous Land Use:** Landfill

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N, R.8E., sec 20, NW.

0 — 100

**Solar Score: 97**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 20 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 160 |
| Slope <5% | 160 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0 miles |
| 115kV | 169 miles |
| 230kV | 0.3 miles |
| 500kV | 0.1 miles |
| Active Management Area | No |

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Managed as VRM Class II and III
* Special Recreation Management Area

## Selected Environmental Factors

- Right-of-ways present
- Managed as VRM Class II and III
- Special Recreation Management Area

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# SITE #41

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 20 MW solar energy facility would fit on the 160 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #42

**Name:**
**Prudence**

**Facts:**

**Acres:** 9

**County:** Pima

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential, Pantano Wash

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.14S., R.15E., sec. 17, NWSE.

0 — 100

**Solar Score: 81**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 0.8 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Potentially incompatible adjacent land uses

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 9 |
| Slope <5% | 6 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 23 mile |
| 115kV | 10 miles |
| 230kV | 13 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Active Management Area
- Near urban area
- Special Status Species habitat

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# SITE #42

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of USTs at the site. A portion of the Broadway-Pantano Superfund site, which is on the WQARF Registry, is 0.2 mile to the north of the Prudence Landfill. No other sources of contamination were identified within 0.25 mile of the site, but when looking out to 0.5 mile, several sources exist, per the summary table below. Supporting maps and reports are attached.

The Broadway-Pantano Site consists of the Broadway North Landfill (BNL) the Broadway South Landfill (BSL), and the groundwater contamination associated with both landfills. Groundwater at the site is contaminated with tetrachloroethene (PCE), trichloroethene (TCE) and vinyl chloride occurring over regulatory limits. Other contamination is buried metal waste (dross) at the far southern section of the BNL (closest to the Prudence Landfill). Depth to groundwater is about 340 feet below ground surface. More information on the Broadway-Pantano site is provided in the attached WQARF files. Given the presence of the Pantano Wash immediately to the east of both the Broadway-Pantano site and the Prudence Landfill, groundwater flow in both cases is expected to be toward the east. Groundwater contamination from Broadway-Pantano site is not expected to underlie the Prudence Landfill; likewise, TCE and PCE vapors from the Broadway-Pantano site are not considered to be a concern within the Prudence Landfill footprint. Regardless, any development on the Prudence Landfill would be on the landfill's soil cap, which would not be subject to groundwater flow.

## Site Summary

A 0.8 MW solar energy facility would fit on the 6 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #43

**Name:**
**Quartzsite Area**

**Facts:**

**Acres:** 22,131

**County:** La Paz

**Previous Land Use:** Agricultural

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** State

**Mineral Ownership:** State

**Legal Description:** T.6N., R.19W., T.7N., R.19W.

**Solar Score: 85.5**

**Community Wind Score: 0**

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 2,711 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 22,131 |
| Slope <5% | 21,689 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 24 mile |
| 115kV | 3 miles |
| 230kV | 16 miles |
| 500kV | 20 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Potential mining claims and rights of way
- Partially within Special Status Species habitat
- Sensitive soils

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Sensitive soils
* Includes 18,840 acres within Special Status Species habitat

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# SITE #43

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries. La Paz County Regional Landfill is adjacent to the northeast corner of the Quartzsite site (ADEQ has classified this as a Municipal Landfill); however, the Quartzsite Area is upgradient from the landfill and no effects to soil or groundwater from the landfill would be present.

## Site Summary

A 2,711 MW solar energy facility would fit on the 21,689 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

Soil properties on this site may restrict renewable energy development. Some soil types require additional engineering requirements to support solar or wind energy infrastructure foundations. Further research through the property owner/administrator and USDA NRCS is recommended.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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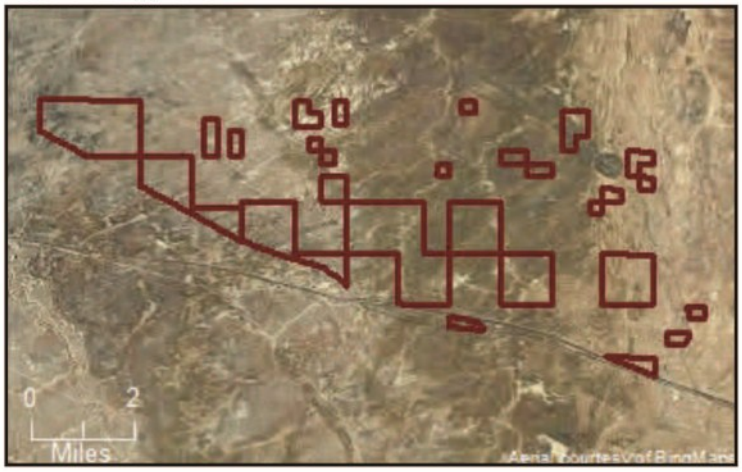
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #44




**Name:**
**Red Gap Ranch**

**Facts:**

**Acres:** 7,985

**County:** Coconino

**Jurisdiction:** N/A

**Previous Land Use:** N/A

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** Private and state

**Mineral Ownership:** N/A

**Legal Description:** N/A

0 100

**Solar Score: 100**

0 100

**Community Wind Score: 60**

0 100

**Utility Wind Score: 76**

**Estimated Maximum Potential Capacity**[1]

**Solar: 998 MW** **Wind: 61 MW**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | Fair |
| Acres | 7,985 |
| Slope <5% | 7,983 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0 miles |
| 115kV | 87 miles |
| 230kV | 5 miles |
| 500kV | 29 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near load center
- Special status species
- Salt River Channel on site

## Site Opportunities

* Majority of site has slope of <5%
* "Fair" wind potential rating on 1,700 acres
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Potential wetlands on 14 acres
* Sensitive soils on 5,316 acres

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# SITE #44

## Remediation/Restoration Requirements

A search of federal and state records indicate two leaking underground storage tanks (LUSTs) within approximately 0.25 mile of the southern edge of a portion of the site. These LUSTs are upgradient from portions of the site and could have associated groundwater contamination plumes present; however, AZDEQ records shown that both of these investigations are closed, presumably indicating that all clean up actions have been completed. Applicants should verify with AZDEQ the worker health and safety implications of closed LUST sites upgradient from this property. Federal and state records show no other present or past contamination or presence of underground storage tanks (USTs) at the site or within a quarter mile of its boundaries.

## Site Summary

A 998 MW solar energy facility would fit on the 7,983 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

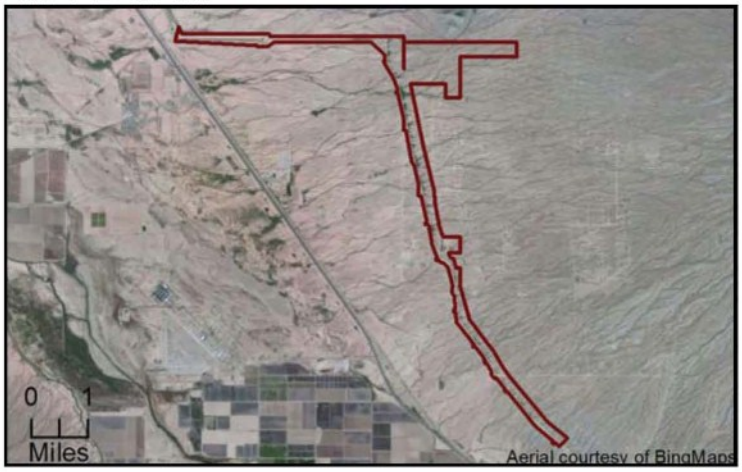
A small (14-acre) portion of this site may contain wetlands. If field-verified, development would need to avoid this area. Consultation with USFWS is recommended to determine appropriate mitigation and avoidance techniques.

Soil properties on this site may restrict renewable energy development. Some soil types require additional engineering requirements to support solar or wind energy infrastructure foundations. Further research through the property owner/administrator and USDA NRCS is recommended.

# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #45




**Name:**
**Red Rocks CAP**

**Facts:**

**Acres:** 2,213

**County:** Pima and Pinal

**Previous Land Use:** Bureau of Reclamation ROW

**Adjacent Land Use**: Undeveloped, transportation

**Surface Ownership:** Bureau of Reclamation/BLM

**Mineral Ownership:** Federal

**Legal Description:** T. 4N., R.4W. Sec. 13, 21, 22, 23, 24 (partial sections).

0 — 100

**Solar Score: 82.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 276 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 2,213 |
| Slope <5% | 2,210 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 2 miles |
| 115kV | 0 miles |
| 230kV | 2 miles |
| 500kV | 0 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Arizona Game and Fish Department Conservation Potential
* Desert tortoise habitat
* AGFD big game habitat
* Special Status Species habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## Selected Environmental Factors

- Site is close to a load center
- Arizona Game and Fish Department Conservation Potential
- Special Status Species Habitat
- AZGFD Conservation Potential area

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# SITE #45

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 276 MW solar energy facility would fit on the 2,210 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

These lands were originally surveyed under the NEPA process before construction of the Central Arizona Project (CAP). This includes areas identified by Reclamation as wildlife habitat areas ("green-up" areas) to be managed as mitigation for impacts from the CAP construction. Use of such areas would require consideration of mitigation for losses of wildlife habitat.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #46

**Name:**
**Ryan**

**Facts:**

**Acres:** 16

**County:** Pima

**Jurisdiction:** Private

**Previous Land Use:** Landfill

**Adjacent Land Use**: Airport

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.15S., R.12E., sec. 7, Lot 2

0 — 100

**Solar Score: 94**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 2 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 16 |
| Slope <5% | 16 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 37 miles |
| 115kV | 5 miles |
| 230kV | 16 miles |
| 500kV | 29 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Near urban area
- Special status species
- Compatible surrounding land use

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Potentially compatible adjacent land uses

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# SITE #46

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 2 MW solar energy facility would fit on the 16 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #47

**Name:**
**Ryland**

**Facts:**

**Acres:** 27

**County:** Pima

**Jurisdiction:** Private

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential and undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.14S., R.13E., sec. 26, SENW

0 — 100

**Solar Score: 85**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 3.4 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is within a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Site has 7 acres of potential wetlands
* Potentially incompatible adjacent land uses
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 27 |
| Slope <5% | 27 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 29 miles |
| 115kV | 2 miles |
| 230kV | 11 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Urban area
- Special status species
- AZGFD Conservation Potential area

DRAFT

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# SITE #47

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 3.4 MW solar energy facility would fit on the 27 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

A 7-acre portion of this site may contain wetlands. If field-verified, development would need to avoid this area. Consultation with USFWS is recommended to determine appropriate mitigation and avoidance techniques.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #48

**Solar Score: 83**

**Community Wind Score: 0**

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 107 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Site has 310 acres of desert tortoise habitat
* Site has 973 acres managed as VRM Class III
* Potentially incompatible adjacent land uses
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## Name: Saginaw-Valhalla-Snyder Mine and Quarry

**Facts:**

**Acres:** 997

**County:** Pima

**Jurisdiction:** BLM

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Residential, undeveloped, commercial

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.15S., R.12E., sec. 11, E2NE, NWNE, N2 SWNE, SESWNE, SE; sec. 12, Lots 5-12, W2, N2SE, SWSE; T.15S., R.12E., sec. 3, Lots 9-16, SWNW; sec. 4, Lots 1 and 9-10, S2NENE, SENE; T.15S., R.12E., sec. 20, S2NW, SW, S2SE.

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 997 |
| Slope <5% | 856 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 0.1 miles |
| 230kV | 12 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

## Selected Environmental Factors

- Site is managed as VRM Class III
- Special status species habitat
- Site has 310 acres of desert tortoise habitat
- Nominated for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #48

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 107 MW solar energy facility would fit on the 856 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located partially within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #49

**Name:**
**Saginaw Hill**

**Facts:**

**Acres:** 503

**County:** Pima

**Jurisdiction:** BLM

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Residential and undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.15S., R.12E., sec. 11, E2NE, NWNE, N2 SWNE, SESWNE, SE; sec. 12, Lots 5-12, W2, N2SE, SWSE

0 100

**Solar Score: 89**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 54 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 503 |
| Slope <5% | 433 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 0.1 miles |
| 230kV | 12 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

## Site Opportunities

* Solar potential rating of Good on entire site
* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Site is managed as VRM Class III
* Potentially incompatible adjacent land uses

## Selected Environmental Factors

* Near urban area
* Special status species habitat
* Site is managed as VRM Class III
* Potentially incompatible adjacent land uses

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# SITE #49

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 54 MW solar energy facility would fit on the 533 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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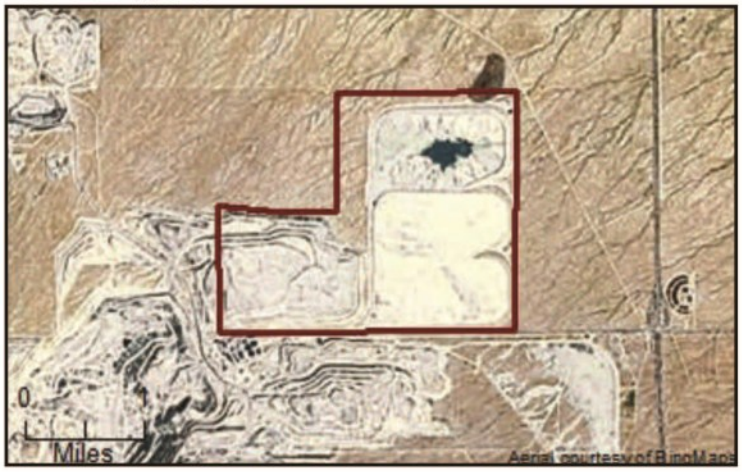
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #50




**Name:**
**San Xavier Mine**

**Facts:**

**Acres:** 2,573

**County:** Pima

**Jurisdiction:** Tohono O'odham

**Previous Land Use:** Mine

**Adjacent Land Use**: Industrial and undeveloped

**Surface Ownership:** Reservation

**Mineral Ownership:** Reservation

**Legal Description:** T.16S., R.13E., sec. 20, E2; sec. 21, All; sec. 28, All; sec. 30, E2

0 — 100

**Solar Score: 86**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 275 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 2,573 |
| Slope <5% | 2,198 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 26 miles |
| 115kV | 5 miles |
| 230kV | 5 miles |
| 500kV | 38 miles |
| Active Management Area | Yes |

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Portions of site may be contaminated

## Selected Environmental Factors

- Near urban area
- Special status species habitat
- Close to transmission and roads

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# SITE #50

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 275 MW solar energy facility would fit on the 2,198 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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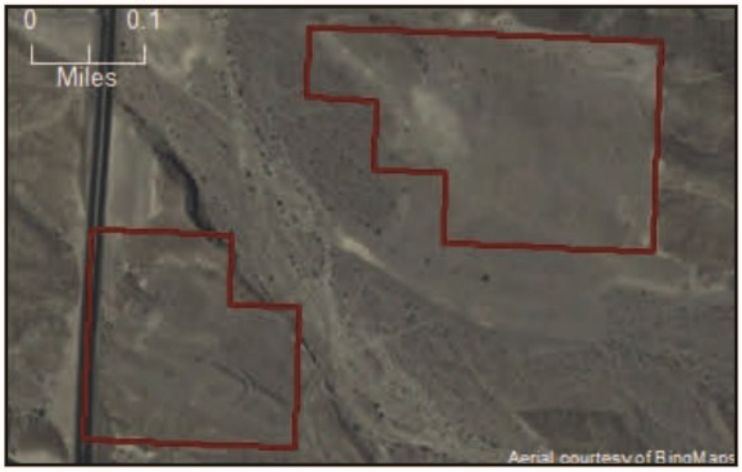
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #51




**Name:**
**Silver Creek Landfill**

**Facts:**

**Acres:** 50

**County:** Mohave

**Jurisdiction:** BLM

**Previous Land Use:** Landfill

**Adjacent Land Use**: Vacant and residential

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.20N., R.21W

0 — 100

**Solar Score: 65.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 37.5**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.1 MW** **Wind: 0.4 MW**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | Fair |
| Acres | 50 |
| Slope <5% | 9 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 6 miles |
| 115kV | 63 miles |
| 230kV | 0.3 miles |
| 500kV | 38 miles |
| Active Management Area | No |

## Site Opportunities

* Wind potential rating of "Fair" on 11 acres
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Only 9 acres exhibits slope less than 5 percent
* Special Status Species Habitat
* Desert tortoise habitat
* Potentially incompatible adjacent land uses

## Selected Environmental Factors

- Near urban area
- Special status species habitat
- Desert tortoise habitat
- Near 230kV line

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# SITE #51

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 1.1 MW solar energy facility would fit on the 9 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #52

**Name:**
**Silverbell**

**Facts:**

**Acres:** 36

**County:** Pima

**Jurisdiction:** City of Tucson

**Previous Land Use:** Landfill

**Adjacent Land Use**: Mixed (Urban)

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.13S., R.13E., sec. 28, W2SE; sec. 33, NENE

0 100

**Solar Score: 91**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 4.5 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 36 |
| Slope <5% | 36 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 0 miles |
| 230kV | 17 miles |
| 500kV | 23 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- In urban area
- Special status species habitat
- Within 0.25-mile of National Historic Trail

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Site is within 0.25-mile of National Historic Trail
* Potentially incompatible adjacent land uses

DRAFT

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# SITE #52

## Remediation/Restoration Requirements

The site is a closed municipal solid waste landfill and is classified by the EPA as a Superfund site. Silverbell is listed on the WQARF Registry. Sites placed on the Registry are scored using an approved eligibility and evaluation (E&E) model for evaluating risk and other environmental factors. The Silverbell site has an E&E score of 51 out of a possible total score of 120. The attached WQARF reports provide detailed information on the site and its environmental issues.

Seven leaking underground storage tanks are reported to occur within 0.5 mile of the site. There are no brownfields within 0.5 mile. Supporting maps and reports are attached. Due to the composition of the site as a landfill, any earth-disturbing activities on the site would be on a soil cap, which would not be subject to contamination from migrating groundwater.

Four CERCLIS/Superfund sites exist within one mile of the site; however, groundwater contamination is not expected to be a concern given the soil cap on the landfill.

## Site Summary

A 4.5 MW solar energy facility would fit on the 36 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #53

**Name:**
**Snowflake Mine**

**Facts:**

**Acres:** 24

**County:** Mohave

**Jurisdiction:** BLM

**Previous Land Use:** Mine

**Adjacent Land Use**: Commercial

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.41N., R.13W., sec. 25, NW1/4

0 — 100

**Solar Score: 71**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 0.9 MW** **Wind: None**

## Site Opportunities

* Site is close to roads and 500kV transmission line

## Site Constraints

* Special Status Species Habitat
* Special Recreation Management Area
* Only 29 percent of site exhibits slope of <5 percent

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 24 |
| Slope <5% | 7 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 98 miles |
| 115kV | 166 miles |
| 230kV | 112 miles |
| 500kV | 2 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near 500kV line
- Special status species habitat
- Remote location

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# SITE #53

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 0.9 MW solar energy facility would fit on the 7 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

The nearby transmission line may offer cost-efficient opportunities for interconnection.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site is located within a Special Recreation Management Area, which may place limitations on development. Developers should consult with the BLM to determine allowable uses in this area.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #54

**Name:**
**Snyder Hill Mine**

**Facts:**

**Acres:** 176

**County:** Pima

**Jurisdiction:** BLM

**Previous Land Use:** Mine

**Adjacent Land Use**: Undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** BLM

**Legal Description:** T.15S., R.12E., sec. 3, Lots 9-16, SWNW; sec. 4, Lots 1 and 9-10, S2NENE, SENE

0 — 100

**Solar Score: 89**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 19 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Desert tortoise habitat
* Site is managed as VRM Class III

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 176 |
| Slope <5% | 151 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 0.1 miles |
| 230kV | 12 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Site is managed as VRM Class III
- Special status species habitat
- Desert tortoise habitat
- Near urban area

DRAFT

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# SITE #54

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 19 MW solar energy facility would fit on the 188 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located partially within desert tortoise habitat and developers should consult with the land management agency, if applicable, and the USFWS regarding potential mitigation and compliance measures.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #55

**Name:**
**Sonoita Landfill**

**Facts:**

**Acres:** 39

**County:** Santa Cruz

**Jurisdiction:** BLM

**Previous Land Use:** Landfill

**Adjacent Land Use**: BLM-administered lands

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.1N, R.3E, sec. 19, Lots 1-3, E2NW, NESW

0 — 100

**Solar Score: 85.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 4.5 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to roads
* Site is close to a load center

## Site Constraints

* Site is far from transmission lines
* Status Species Habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 39 |
| Slope <5% | 36 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 15 miles |
| 115kV | 9 miles |
| 230kV | 20 miles |
| 500kV | 67 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near load center
- Special status species habitat
- Wash on site
- Part of site identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #55

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 4.5 MW solar energy facility would fit on the 36 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

DRAFT

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #56

**Name:**
**St. Mary's**

**Facts:**

**Acres:** 10

**County:** Pima

**Jurisdiction:** Private

**Previous Land Use:** Landfill

**Adjacent Land Use**: Commercial and residential

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** n/a

0 — 100

**Solar Score: 91**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.3 MW** **Wind: None**

## Site Opportunities

* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is within a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Potentially incompatible adjacent land uses

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 10 |
| Slope <5% | 10 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 1 mile |
| 115kV | 3 miles |
| 230kV | 2 miles |
| 500kV | 14 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- In urban area
- Special status species habitat
- Close proximity to transmission and roads
- Surrounded by residential and commercial development

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# SITE #56

## Remediation/Restoration Requirements

Drainage is expected to be to the east toward the Santa Cruz River. A search of federal and state records indicate the presence of one or two leaking underground storage tanks approximately 0.4 to 0.5 miles to the east of the site, rendering them potentially upgradient in terms of groundwater flow. Groundwater plumes could have resulted in contamination of groundwater under the landfill. Contaminated groundwater underlying a landfill could result in soil vapor intrusion into enclosed spaces within the landfill and could pose a potential hazard to workers that may excavate into the solid waste contained therein.

## Site Summary

A 1.3 MW solar energy facility would fit on the 10 acres of land with a slope of <5%. Size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #57

**Name:**
**Tombstone Landfill**

**Facts:**

**Acres:** 43

**County:** Cochise

**Jurisdiction:** BLM

**Previous Land Use:** Landfill

**Adjacent Land Use**: Commercial

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.19S., R.22E

0 100

**Solar Score: 83.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 4.1 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints
* BLM parcel nominated for disposal

## Site Constraints

* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 43 |
| Slope <5% | 33 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0 miles |
| 115kV | 5 miles |
| 230kV | 3 miles |
| 500kV | 79 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near urban area
- Close proximity to transmission and roads
- BLM parcel nominated for disposal
- Part of site identified for disposal by BLM
- AZGFD Conservation Potential area

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# SITE #57

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

If future surveys reveal any contamination, the type and location of solar and wind energy facilities may be limited. For example, construction of solar and wind plants may entail significant excavation of contaminated soil, or site development may involve extensive hardscaping, which may serve as a cap to prevent further migration of contamination. In some cases, removal of contaminated soils and prevention of any additional ground water contamination may suffice as a remedial effort.

## Site Summary

A 4.1 MW solar energy facility would fit on the 33 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

Site characteristics may impose restrictions on the type and amount of renewable energy that can be developed on a landfill. For example, gas collection systems may require setbacks and other siting considerations. Technical feasibility of solar and wind developments on landfills depends on compatibility of the solar or wind systems with the existing landfill components.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #58

**Name:**
**Torrez-Brant**

**Facts:**

**Acres:** 408

**County:** Maricopa

**Jurisdiction:** Private

**Previous Land Use:** Agricultural

**Adjacent Land Use**: Agricultural

**Surface Ownership:** Private

**Mineral Ownership:** Private, State

**Legal Description:** T.4S., R.10W., sec. 4, W2, SE, W2 NE

0 100

**Solar Score: 97**

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 51 MW** **Wind: None**

## Site Opportunities

* Solar potential rating of Good on entire site
* Entire site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Initial GIS screening did not identify potential site constraints. More detailed screening and site visits or surveys may identify constraints.

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 408 |
| Slope <5% | 408 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 4 miles |
| 115kV | 67 miles |
| 230kV | 17 miles |
| 500kV | 3 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near load center
- Entire site rated Good for solar
- Surrounded by agricultural and undeveloped land

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# SITE #58

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 51 MW solar energy facility would fit on the 408 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #59

**Name:**
**Tumamoc**

**Facts:**

**Acres:** 21

**County:** Pima

**Jurisdiction:** Private

**Previous Land Use:** Landfill

**Adjacent Land Use**: Residential, open space

**Surface Ownership:** Private

**Mineral Ownership:** Federal

**Legal Description:** T.14S., R13E., sec. 16, SESE

0 — 100

**Solar Score: 73.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 0.9 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 21 |
| Slope <5% | 7 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 31 miles |
| 115kV | 0 miles |
| 230kV | 13 miles |
| 500kV | 27 miles |
| Active Management Area | Yes |

## Site Opportunities

* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species habitat
* Only 33 percent of site exhibits slope of <5 percent

## Selected Environmental Factors

- In urban area
- Special status species habitat
- Nearby residential development
- Close proximity to transmission and roads

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# SITE #59

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 0.9 MW solar energy facility would fit on the 7 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #60

**Name:**
**Twin Peaks-Sandario CAP**

**Facts:**

**Acres:** 888

**County:** Pima

**Previous Land Use:** Bureau of Reclamation ROW

**Adjacent Land Use**: Residential, mining

**Surface Ownership:** Bureau of Reclamation

**Mineral Ownership:** Federal

**Legal Description:** T.12S., R.11E., secs 14, 15, 23, 26, 27, 28, 32, 33 T.13S., R.11E., sec. 5, 6, 7, 8 (all partial sections).

0 — 100

**Solar Score: 88.5**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 109 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Arizona Game and Fish Department Conservation Potential
* AGFD big game habitat
* Special Status Species habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 888 |
| Slope <5% | 870 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0 miles |
| 115kV | 0 miles |
| 230kV | 13 miles |
| 500kV | 12 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Site is close to a load center
- Arizona Game and Fish Department Conservation Potential
- Special Status Species habitat
- AZGFD Conservation Potential area

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# SITE #60

## Remediation/Restoration Requirements

A search of federal and state records indicate one underground storage tank (UST) approximately 0.25-mile to the west of the site. This UST is not reported as leaking. Records provide no indication of present or past contamination at the site or within a quarter mile of its boundaries.

## Site Summary

A 109 MW solar energy facility would fit on the 870 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV and CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site contains AZGFD big game habitat and may be subject to mitigation requirements to protect species viability.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

These lands were originally surveyed under the NEPA process before construction of the Central Arizona Project (CAP). This includes areas identified by Reclamation as wildlife habitat areas ("green-up" areas) to be managed as mitigation for impacts from the CAP construction. Use of such areas would require consideration of mitigation for losses of wildlife habitat.

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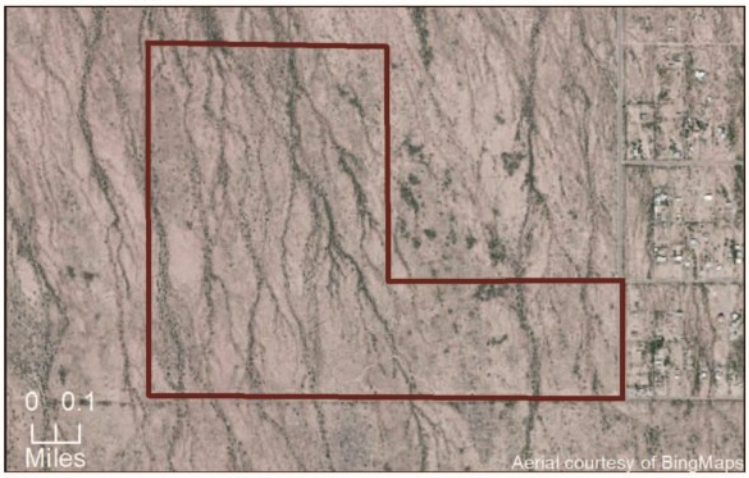
# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #61




**Name:**
**Valhalla**

**Facts:**

**Acres:** 317

**County:** Pima

**Jurisdiction:** BLM

**Previous Land Use:** Undeveloped

**Adjacent Land Use**: Residential and undeveloped

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.15S., R.12E., sec. 20, S2NW, SW, S2SE.

0 — 100

**Solar Score: 92**

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 34 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5%
* Site is close to transmission lines and roads
* Site is close to a load center
* Minimal environmental constraints

## Site Constraints

* Active Management Area
* Special Status Species Habitat
* Potentially incompatible adjacent land uses

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 317 |
| Slope <5% | 273 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 33 miles |
| 115kV | 0.1 miles |
| 230kV | 12 miles |
| 500kV | 28 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- Near urban area
- Special status species habitat
- Site is identified for disposal by BLM
- Site is managed as VRM Class III

DRAFT

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# SITE #61

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 34 MW solar energy facility would fit on the 273 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site suitable for PV or CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

This site is located on BLM-administered lands with a VRM class that may require special design features to minimize visual disturbances. Consultation with the BLM will determine whether the VRM class will impact development.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #62

**Name:**
**Vincent Mullins**

**Facts:**

**Acres:** 32

**County:** Pima

**Jurisdiction:** Private

**Previous Land Use:** Landfill

**Adjacent Land Use**: Industrial and residential

**Surface Ownership:** Private

**Mineral Ownership:** Private

**Legal Description:** T.14S., R.15E., sec. 5, NWSW

0 — 100

**Solar Score: 73**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 1.9 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 32 |
| Slope <5% | 15 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 25 miles |
| 115kV | 9 miles |
| 230kV | 15 miles |
| 500kV | 26 miles |
| Active Management Area | Yes |

### Selected Environmental Factors

- In urban area
- Special status species habitat
- Nearby residential developments
- Close proximity to road network

## Site Opportunities

* Site is close to transmission lines and roads
* Site is within a load center
* Minimal environmental constraints

## Site Constraints

* Only 47 percent of site exhibits slope of <5 percent
* Active Management Area
* Special Status Species Habitat
* Potentially incompatible adjacent land uses

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# SITE #62

## Remediation/Restoration Requirements

A search of federal and state records indicate the presence of leaking underground storage tanks directly to the east of the site. Drainage is expected to be to the west to the Pantano Wash, directly adjacent to the landfill. Groundwater plumes could have resulted in contamination of groundwater under the landfill.

## Site Summary

A 1.9 MW solar energy facility would fit on the 15 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

There may be fewer environmental constraints associated with this site, which could result in a reduced likelihood for increased permitting and construction costs and public opposition. A more detailed site assessment can help identify the presence or likelihood of sensitive resources.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Surrounding areas may include some potentially incompatible land uses. For sites under local jurisdiction, developers should contact local planning departments to determine adjacent zoning designations.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #63

**Name:**
**White Sage Gravel Pits**

**Facts:**

**Acres:** 61

**County:** Coconino

**Previous Land Use:** Gravel pits

**Adjacent Land Use**: Undeveloped BLM-administered land

**Surface Ownership:** BLM

**Mineral Ownership:** Federal

**Legal Description:** T.40N., R.2W., sec. 2, S2SWSW, NWSE

0 100

**Solar Score: 82**

Site is less than 100 acres and may not be suitable for CSP technology.

0 100

**Community Wind Score: 0**

0 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 3.4 MW** **Wind: None**

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 61 |
| Slope <5% | 27 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 44 miles |
| 115kV | 157 miles |
| 230kV | 47 miles |
| 500kV | 0.4 miles |
| Active Management Area | No |

## Site Opportunities

* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* BLM Special Recreation Management Area
* Special Status Species Habitat
* Sensitive soils
* Only 44 percent of site exhibits slope of <5 percent

## Selected Environmental Factors

- Near load center
- Special status species habitat
- Close proximity to 500kV line

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# SITE #63

## Remediation/Restoration Requirements

A search of federal and state records indicate no present or past contamination or presence of underground storage tanks at the site or within a quarter mile of its boundaries.

## Site Summary

A 3.4 MW solar energy facility would fit on the 27 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

The site is located within a Special Recreation Management Area, which may place limitations on development. Developers should consult with the BLM to determine allowable uses in this area.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

Soil properties on this site may restrict renewable energy development. Some soil types require additional engineering requirements to support solar or wind energy infrastructure foundations. Further research through the property owner/administrator and USDA NRCS is recommended.

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# Restoration Design Energy Project

*Environmental Impact Statement—Nominated Sites Summary*

## SITE #64

**Name:**
**Wildcat Hill**

**Facts:**

**Acres:** 75

**County:** Coconino

**Jurisdiction:** City of Flagstaff

**Previous Land Use:** Brownfield

**Adjacent Land Use**: Industrial, undeveloped

**Surface Ownership:** Private

**Mineral Ownership:** Private, State

**Legal Description:** T.21N., R.8E., sec. 9, NW.

0 — 100

**Solar Score: 94.5**

Site is less than 100 acres and may not be suitable for CSP technology.

0 — 100

**Community Wind Score: 0**

0 — 100

**Utility Wind Score: 0**

**Estimated Maximum Potential Capacity**[1]

**Solar: 9 MW** **Wind: None**

## Site Opportunities

* Majority of site has slope of <5 percent
* Site is close to transmission lines and roads
* Site is close to a load center

## Site Constraints

* Active Management Area
* Special Status Species habitat
* AZGFD big game habitat
* AZGFD Species and Habitat Conservation Guide Conservation Potential

## About This Site

| Characteristic | Description |
|---|---|
| Solar Potential | Good |
| Wind Potential | None |
| Acres | 75 |
| Slope <5% | 72 acres |
| Distance to Graded Road | <1 mile |
| Distance to Transmission Interconnection: | |
| 69kV | 0.2 miles |
| 115kV | 66 miles |
| 230kV | 0 miles |
| 500kV | 32 miles |
| Active Management Area | No |

### Selected Environmental Factors

- Near urban area
- Special status species habitat
- Within AZGFD big game habitat
- AZGFD Conservation Potential area

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# SITE #64

## Remediation/Restoration Requirements

The site is a biosolids processing area for the Wildcat Hill Wastewater Treatment Facility. The site will receive a Phase I environmental site assessment from ADEQ. A search of federal and state records indicate no past contamination or presence of underground storage tanks (USTs) at the site. An existing UST, reported as "non-leaking" exists at the southeastern edge of the site. Other USTs and leaking USTs are across Rio de Flag, and therefore, there would be no hydrologic connection with any shallow groundwater present at the site.

## Site Summary

A 9 MW solar energy facility would fit on the 72 acres of land with a slope of <5 percent. The size of developable acreage would likely make the site unsuitable for CSP technology.

This site's close proximity to roads can lower construction costs by providing easy access for equipment and workers. Nearby transmission lines may offer cost-efficient opportunities for interconnection.

The site's proximity to a load center may decrease transmission costs while increasing distribution options. Selling solar energy-generated electricity to a local market may increase community support for a project.

As a part of an Active Management Area, this site is within a region with heavy reliance on mined groundwater. Active Management Areas are subject to regulation pursuant to the Arizona Groundwater Code. Management goals for the Active Management Area may restrict water-intensive uses, such as solar energy generation requiring water for cooling or condensation.

The site contains habitat for federal or state-listed species, including threatened and endangered species. As a result, developers should consult with the appropriate state or federal land management agency and USFWS to determine which species' habitat may be present on the site and begin potential compliance process with the Endangered Species Act.

The site overlaps with an Arizona Game and Fish Department Species and Habitat Conservation Guide Conservation Potential area. These areas contain critical habitat and provide opportunities for people to enjoy and benefit from the presence of wildlife. Conservation potential areas are ranked on a scale of 1 to 6, with 1 indicating the lowest conservation potential, and 6 indicating the highest conservation potential. This site contains tier 4, 5, and/or 6 conservation potential.

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