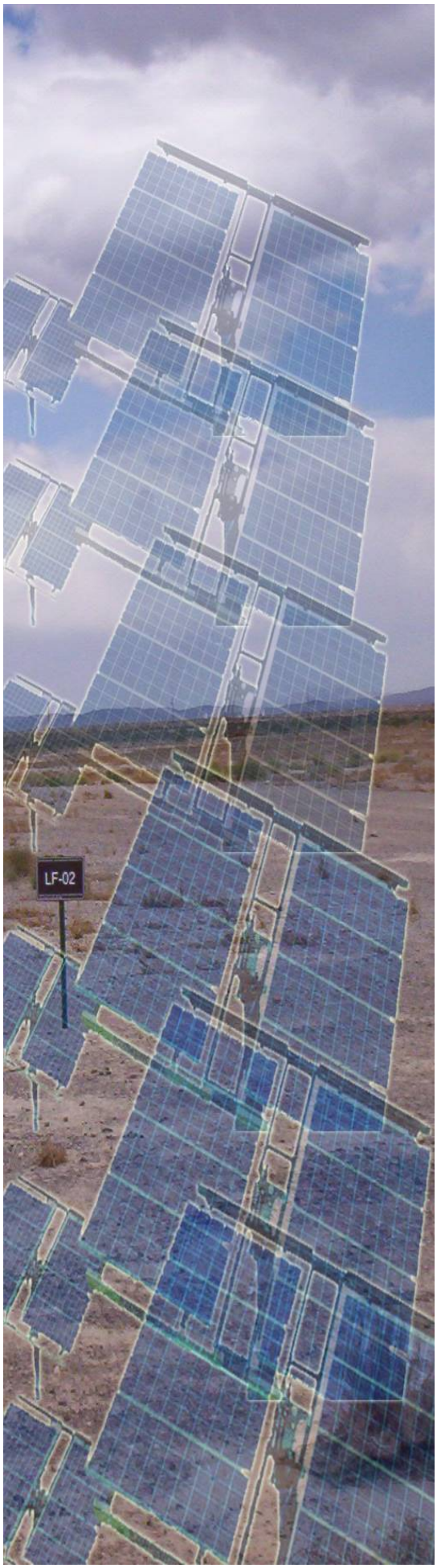



*Final*

# ENVIRONMENTAL ASSESSMENT

**for**

# LEASING NELLIS AIR FORCE BASE LAND FOR CONSTRUCTION & OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM, CLARK COUNTY, NEVADA

**August 2006**

U.S. AIR FORCE

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AC | Alternating current |
| ACC | Air Combat Command |
| AFB | Air Force Base |
| AFCEE | Air Force Center for Environmental Excellence |
| AFF | Air Force form |
| BMPs | Best management practices |
| CAA | Clean Air Act |
| CEQ | Council on Environmental Quality |
| CES | Civil Engineer Squadron |
| CEV | Environmental Management Flight |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CO | Carbon monoxide |
| CWA | Clean Water Act |
| DC | Direct current |
| EA | Environmental Assessment |
| EIAP | Environmental Impact Analysis Process |
| EPA | Environmental Protection Agency |
| ERP | Environmental Restoration Program |
| *et al*. | *Et alii* (Latin phrase meaning “and others”) |
| HAZMART | A central location ("pharmacy") where materials are tracked and controlled |
| HAZWOPER | Hazardous Waste Operation and Emergency Response |
| *i.e.* | *id est* (Latin phrase meaning “that is”) |
| KVA | Kilovolt ampere |
| LF | Landfill |
| MMI | Modified Mercalli intensity scale |
| MW | Megawatts |
| NAAQS | National Ambient Air Quality Standards |
| NDEP | Nevada Division of Environmental Protection |
| NEPA | National Environmental Policy Act |
| $NO_x$ | Nitrogen oxides |
| OSHA | Occupational Safety and Health Administration |
| PL | Public Law |
| $PM_{10}$ | Particulate matter ≤ 10 microns in diameter |
| POL | Petroleum, oils, and lubricants |
| RPM | Restoration Program Manager |
| SHPO | State Historic Preservation Officer |
| $SO_2$ | Sulfur dioxide |
| SPVS | Solar photovoltaic system |
| SWPPP | Storm Water Pollution Prevention Plan |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish & Wildlife Service |
| USC | United States Code |
| VOC | Volatile organic compound |

## FINDING OF NO SIGNIFICANT IMPACT

### 1. Name of the Action

LEASING NELLIS AIR FORCE BASE LAND FOR CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM, CLARK COUNTY, NEVADA

### 2. Description of the Proposed Action and Alternatives

Nellis Air Force Base (AFB) proposes to lease approximately 140 acres of land within a 207-acre parcel of Area III for construction of a solar photovoltaic system (SPVS). The SPVS would provide Nellis AFB with a cost-efficient renewable energy source to augment the existing power supply that relies on fossil fuels. The SPVS would consist of solar panel arrays sufficient to generate up 18 MW DC, which would be transformed into 13.5 MW AC. The SPVS, comprised of solar panel arrays embedded into the ground with concrete footings, would not affect the integrity of the existing power grid. Conduit would be run underground under the proposed action and above ground in Alternative Action 1.

There would be light construction activities associated with the proposed action and alternative actions 1 and 2 that would include grading, trenching, and assembly of the arrays. Under the No Action Alternative, the photovoltaic array would not be constructed. Nellis AFB would seek alternative methods to meet the requirements of the Energy Policy Act of 2005 and Department of Defense and Air Force energy policy goals.

### 3. Summary of Environmental Resources and Impacts.

Implementation of the proposed action and the alternative actions would have no significant impacts on land use; air quality; water resources; safety; hazardous materials/hazardous waste; solid waste; biological resources; cultural resources; geology and soils, including Environmental Restoration Program (ERP) sites; and socioeconomics. There would be no significant impacts to human health or the natural environment now or in the foreseeable future.

### 4. Conclusion

Pursuant to the Council on Environmental Quality (CEQ) Regulations (40 CFR, Parts 1500 - 1508) implementing procedural provisions of the *National Environmental Policy Act* of 1969 (PL 91-190, 42 USC 4321-4347), as amended, and 32 CFR 989, which implements the Environmental Impact Analysis Process (EIAP) for Air Force actions, the United States Air Force at Nellis AFB explored and analyzed the potential environmental impacts from the proposed outgrant lease for construction and operation of a solar photovoltaic system at Nellis AFB in Clark County, Nevada in this EA. Based on the findings and conclusions of this EA, an Environmental Impact Statement is not required.

Maria J. Dowling

MARIA J. DOWLING
Colonel, USAF
Vice Commander, 99th Air Base Wing

27 Aug 06

Date

# *FINAL*
# ENVIRONMENTAL ASSESSMENT

## for

## Leasing Nellis Air Force Base Land for Construction and Operation of a Solar Photovoltaic System, Clark County, Nevada

**August 2006**

## EXECUTIVE SUMMARY

### *LEASING NELLIS AIR FORCE BASE LAND FOR CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM, CLARK COUNTY, NEVADA*

The United States (US) Air Force at Nellis Air Force Base (AFB) has prepared this Environmental Assessment to comply with the *National Environmental Policy Act* of 1969, as amended. This document evaluates the potential environmental impacts of activities associated with the proposed US Air Force outgrant lease of land in Area III on Nellis Air Force Base, Nevada to a private entity for construction and operation of a solar photovoltaic system (SPVS). The proposed actions would support the Energy Policy Act of 2005 and would increase overall Air Force use of renewable energy, thus sustaining Air Force and Department of Defense energy policy goals.

The SPVS would provide Nellis AFB with a cost-efficient renewable energy source to augment the existing power supply, which relies heavily on fossil fuels. The SPVS would consist of solar panel arrays sufficient to generate up to 18 megawatts direct current that would be transformed into 13.5 megawatts alternating current. The system could include a combination of fixed arrays facing to the south and tracking arrays of both the one-axis and two-axis types or any one of the former types. The arrays would be embedded into the ground with concrete footings. Conduit would be run underground under the proposed action and above ground in Alternative Action 1. There would be light construction activities associated with the proposed project, such as minor grading, trenching, and the assembly of the arrays. Under Alternative Action 2, all arrays would be assembled off base and transported to Nellis Air Force Base.

Based upon the nature of the activities that would occur under the proposed action and alternative actions, Nellis AFB environmental program managers determined that the following resources could be affected: land use; air quality; water resources; safety; hazardous materials/hazardous waste; solid waste; biological resources; cultural resources; geology and soils including Environmental Restoration Program sites; and socioeconomics. The existing conditions were evaluated and documented as the basis for determining the environmental consequences.

The environmental consequences of the proposed action and its alternatives were analyzed and no significant impacts to human health or the natural and cultural environment, now or in the foreseeable future, were found. These conclusions were the basis for the decision to issue a Finding of No Significant Impact in accordance with the Council on Environmental Quality Regulations (40 CFR, Parts 1500 -1508), which implements the procedural provisions of the *National Environmental Policy Act* of 1969 (PL 91-190, 42 USC 4321-4347), as amended, and 32 CFR 989*,* which implements the Environmental Impact Analysis Process (EIAP) for Air Force actions.

## TABLE OF CONTENTS

**ACRONYMS AND ABBREVIATIONS** ..... **3**
**FINDING OF NO SIGNIFICANT IMPACT** ..... **5**
**EXECUTIVE SUMMARY** ..... **9**

**1.0 PURPOSE AND NEED FOR PROPOSED ACTION** ..... **13**
*1.1 Purpose and Need* ..... *13*
*1.2 Location of Proposed Action* ..... *14*

**2.0 DESCRIPTIONS OF PROPOSED ACTION AND ALTERNATIVE ACTIONS** ..... **17**
*2.1 Proposed Action* ..... *17*
*2.2 Alternative Action 1* ..... *18*
*2.3 Alternative Action 2* ..... *18*
*2.4 No-Action Alternative* ..... *18*
*2.5 Federal, State, and Local Permits, Licenses, and Fees/Nellis AFB Environmental Plans* ..... *18*

**3.0 AFFECTED ENVIRONMENT** ..... **21**
*3.1 Land Use* ..... *21*
*3.2 Air Quality* ..... *23*
*3.3 Water Resources* ..... *25*
*3.4 Biological Resources* ..... *27*
*3.5 Cultural Resources* ..... *32*
*3.6 Geology and Soils* ..... *33*
*3.7 Socioeconomics* ..... *37*

**4.0 ENVIRONMENTAL CONSEQUENCES** ..... **39**
*4.1 Air Installation Compatible Use Zone* ..... *39*
*4.2 Air Quality* ..... *40*
*4.3 Water Resources* ..... *42*
*4.4 Safety and Occupational Health* ..... *43*
*4.5 Hazardous Materials/Waste and Solid Waste* ..... *43*
*4.6 Biological Resources* ..... *44*
*4.7 Cultural Resources* ..... *44*
*4.8 Geology and Soils* ..... *45*
*4.9 Socioeconomics* ..... *47*

**5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES** ..... **49**
*5.1 Cumulative Impacts* ..... *49*

**LITERATURE CITED** ..... **51**
**LIST OF PREPARERS** ..... **53**
**Appendix A: Air Emissions Calculations** ..... **55**
**Appendix B: Interagency, Intergovernmental, and Public Coordination List** ..... **57**
**Appendix C: Interagency, Intergovernmental, and Public Comments** ..... **59**

## LIST OF FIGURES

**Figure 1.1.** Location of Nellis AFB in Nevada. ..... 14
**Figure 1.2.** Location of the Proposed Solar Photovoltaic Project Area on Nellis AFB. ..... 15
**Figure 3.1.** Railroad Right-of-Way through Proposed Project Area ..... 21
**Figure 3.2.** Locations of Railroad and Utility Lines in Proposed SPVS Project Area ..... 22
**Figure 3.3.** Stormwater Drainages Crossing Proposed Project Area ..... 26
**Figure 3.4.** Native Creosote Bush-White Bursage Community in the Proposed Project Area ..... 28
**Figure 3.5.** Barbwire Russian Thistle in the Proposed Project Area ..... 28
**Figure 3.6.** Map Outlining 2004 Area III Desert Tortoise Survey Area ..... 30
**Figure 3.7.** Map of Las Vegas Bearpoppy and Las Vegas Buckwheat Plant Locations Observed During the 2004 Survey ..... 31
**Figure 3.8.** Geologic Map of Nellis AFB (digitally compiled from Matti *et al.*, 1993)..... 34
**Figure 3.9.** Las Vegas Valley Shear Zone (digitally compiled from Longwell *et al.*, 1965)... 34
**Figure 3.10.** Area III Section of Soil Survey Map (digitally compiled from Speck, 1985) ..... 36
**Figure 3.11.** ERP Site LF-02 in Northeast Corner of Proposed Project Area ..... 37

## LIST OF TABLES

**Table 3.1.** National and Nevada Ambient Air Quality Standards ..... 24
**Table 3.2.** Baseline Emission Inventory (2001) Nellis AFB ..... 25
**Table 3.3.** Clark County Emissions for Criteria Pollutants ..... 25
**Table 3.4.** Wildlife Species Observed in Area III During August 2004 Tortoise Survey ..... 29
**Table 3.5.** Cultural Resources Inventories on Nellis AFB and SHPO Review Dates ..... 33
**Table 4.1.** Proposed Action Construction Emissions for Criteria Pollutants ..... 40
**Table 4.2.** Alternative Action 1 Construction Emissions for Criteria Pollutants ..... 41

# 1.0 PURPOSE AND NEED FOR PROPOSED ACTION

Nellis Air Force Base (AFB) has prepared this Environmental Assessment (EA) to comply with the *National Environmental Policy Act* (NEPA) of 1969 (PL 91-190; 42 USC 4321-4347), as amended. Preparation of this EA followed regulations and instructions established in 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)* for the US Air Force, and 40 CFR 1500 – 1508, *Council on Environmental Quality* (CEQ). This EA evaluates the potential environmental impacts of activities associated with the proposed US Air Force outgrant lease of 140 acres within approximately 207 acres of land in Area III on Nellis Air Force Base (AFB), Nevada, to a private entity for construction and operation of an 18 megawatt (MW) direct current (DC), transformed to 13.5 MW alternating current (AC), solar photovoltaic system (SPVS). The Nellis AFB SPVS project would include light construction and maintenance activities.

## *1.1 Purpose and Need*

Within the past several years, costs and demand for energy produced through non-renewable resources, such as crude oil, have increased dramatically. In response to this energy crisis, Congress passed the Energy Policy Act of 2005 (PL 109-58), which was signed by President Bush on August 8, 2005. Among the many energy conservation measures, the Act *directs the federal government to use more renewable energy, with a goal of using 7.5 percent or more by 2013* (US House Committee on Energy and Commerce Press Office, April 2005). Solar power is among the renewable energy sources promoted in the Act.

It is the policy of the Air Force to consider energy conservation in all of its activities. In fiscal year 2005, the Air Force purchased over 40% (> one billion kilowatt hours) of the federal government total for renewable power, receiving recognition from the US Environmental Protection Agency (EPA) as the number one renewable power purchaser in the Green Power Partnership. Currently, 11% of all electricity used by the Air Force is produced from renewable sources, which surpasses the Energy Policy Act mandates by seven years and 3.5% (http://www.epa.gov/greenpower/partners/top25.htm, May 2006; http://www.eere.energy.gov/news/news_detail.cfm/news_id=10029, June 2006). The Department of Defense (DoD), however, stated in a memorandum, Subject: *Installation Energy Policy Goals*, dated November 18, 2005, that each DoD component should strive to aggressively expand use of renewable energy to a total of 25% by the year 2025.

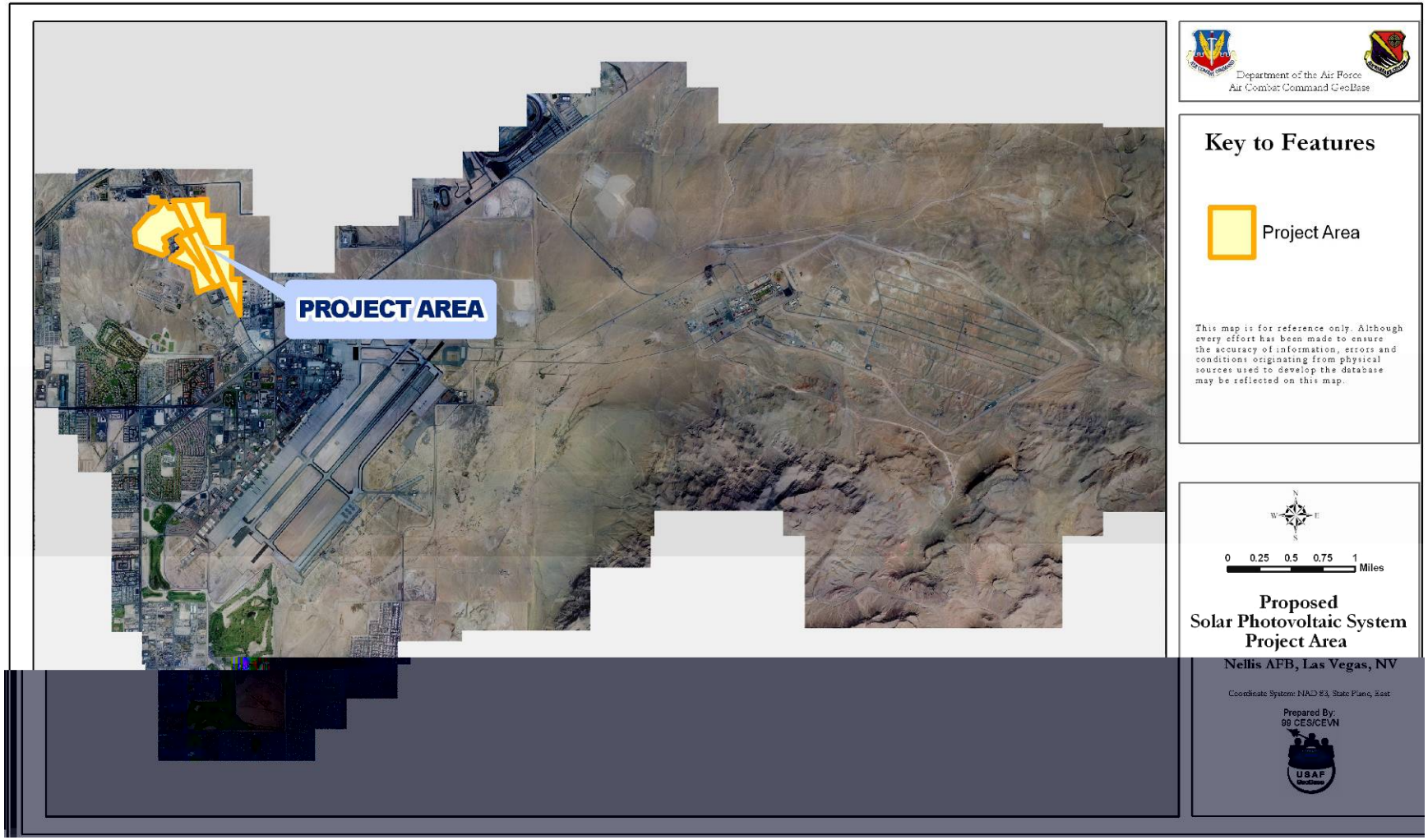
Approximately 90% of the electrical power used by Nellis AFB is provided by Nevada Power, the local company that provides electrical power to southern Nevada. The vast majority of the company's power supply is produced by steam turbine generators (http://www.nevadapower.com/company/history/, May 2006), which are fueled by non-renewable resources. Outgrant lease of Nellis AFB land for the construction and operation of a SPVS, which would provide the base with up to 30% of its required electricity, will substantially decrease Nellis AFB reliance on non-renewable energy sources. The proposed actions would support the Energy Policy Act of 2005, increase overall Air Force use of renewable energy, and allow Nellis AFB to meet, nearly two decades in advance, the DoD installation energy policy long-range goal for renewable energy use.

### *1.2 Location of Proposed Action*

Nellis AFB is located at the northeast edge of the Las Vegas Valley in Clark County, Nevada (Figure 1.1). The base comprises four divisions: Area I, Area II, Area III, and the Small Arms Range. The 207-acre section encompassing the 140 acres of land proposed for outgrant lease for the construction and operation of the SPVS is located in the northeast portion of Area III (Figure 1.2). The acreage is bordered by developed industrial areas to the north and southeast, Nellis AFB facilities to the west/southwest, and to the east, corporation-owned vacant land slated for industrial development.

**Figure 1.1.** Location of Nellis AFB in Nevada.

**Figure 1.2.** Location of the Proposed Solar Photovoltaic Project Area on Nellis AFB



## 2.0 DESCRIPTIONS OF PROPOSED ACTION AND ALTERNATIVE ACTIONS

### *2.1 Proposed Action*

Nellis AFB proposes to lease 140 acres of land within a 207-acre parcel of Area III for construction of a solar photovoltaic system (SPVS). The SPVS would provide Nellis AFB with a cost-efficient renewable energy source to augment the existing energy provided by Nevada Power. Dependence on the current power supply would be reduced up to 30%.

The SPVS would consist of solar panel arrays sufficient to generate 18 MW DC that would be transformed to 13.5 MW AC. The system could include any one, or a combination of, fixed arrays facing to the south and tracking arrays of both the one-axis (automatically swivels east to west) and two-axis (follows precise path of sun at all times through all seasons) types. The arrays would be embedded into the ground with concrete footings.

The power produced by the SPVS would be approximately 400 Volts DC. Inverters would be used to transform DC to AC. Transformers would be installed to step up voltage to 12,470 volts so that it is compatible with the Nellis AFB system. The stepped-up power would then be connected to the Nellis AFB system.

The SPVS would tie into the Nellis AFB electrical system through two overhead circuits, Circuit 5, which runs north along Range Road, and Circuit 6, which currently runs west toward Manch Manor family housing along Stafford Drive. The SPVS would tie into the circuits at multiple locations. A 15 kilovolt ampere (KVA) combination fused cutout / lightning arrestor would be installed at all locations where the SPVS connects to the Nellis AFB electrical infrastructure. This would protect the integrity of the Nellis AFB system during electrical failures and lightning strikes. The SPVS would be designed to shut down immediately if the Nellis AFB power system fails.

All power produced from the SPVS would be used by Nellis AFB. It is estimated that the SPVS would meet 20% to 30% of the Nellis AFB electrical power demands. Electric meters would be placed at each location where the SPVS connects to the Nellis AFB system and at the Nellis AFB substation. The meters would record the total electrical demand on the SPVS and Nellis AFB power consumption. There would be potential for some power to intermittently travel into the Nevada Power system for a brief time each year when electrical power demand for the base is less than the amount of energy produced by the SPVS. Nellis AFB or the contractor would not have the right to sell this power and Nellis AFB would not be charged for any power not used. The SPVS would not produce power at night and would not have any storage capabilities.

Conduit connecting the solar panel arrays to the circuits would be placed underground in trenches that could be as deep as three feet and covered with earth. Where conduit runs under roadways, trenches might be filled with concrete. Following emplacement of the conduit, disturbed areas would be graded to maintain current drainage patterns.

A staging area where solar panels would be assembled, which could include a permanent awning structure, would be placed in the project area. The entire SPVS site would be enclosed by a chain link fence with gate. Regular cleaning of the solar panels would be accomplished by either rinsing with water, blowing with compressed air, or a combination of both. All solid waste generated during construction, operation, and maintenance would be removed by the contractor and disposed of at an appropriate disposal facility outside of Nellis AFB.

### *2.2 Alternative Action 1*

All actions would be the same as for the proposed action except that some of the interconnecting conduit would be run aboveground, attached to existing power poles. This would reduce the amount of ground disturbance, but visual impacts would be slightly increased.

### *2.3 Alternative Action 2*

All actions would be the same as for the proposed action except that the solar panel assembly staging area would be located off-site. The bulky assembled panels would be hauled to the SPVS site at Nellis AFB, requiring several trips to transport the same number of unassembled panels that could be hauled in a single trip. The additional trips would increase freight costs and fuel consumption, as well as increase the workload of security personnel manning the Nellis AFB freight entry gate. The additional consumption of the non-renewable fuel resources required by the additional freight hauling would slightly offset the energy conservation goals of the proposed action.

### *2.4 No-Action Alternative*

Under the no-action alternative, the SPVS would not be installed on Nellis AFB and the creation of a renewable energy source would not occur at this time. The current energy source that relies mostly on non-renewable resources would continue to be used as the sole Nellis AFB power supply until alternative renewable energy sources could be analyzed and developed. Power rates would undoubtedly continue to increase at phenomenal rates and Nellis AFB would continue to consume non-renewable resources until alternative methods of meeting the requirements of the Energy Policy Act of 2005 and DoD and Air Force energy conservation goals were implemented.

### *2.5 Federal, State, and Local Permits, Licenses, and Fees/Nellis AFB Environmental Plans*

The contractor responsible for constructing, operating, and maintaining the solar photovoltaic system would obtain all required federal, state, and local permits. The contractor would cooperate with Nellis AFB to ensure compliance with all applicable federal, state, and local regulations, and DoD and Air Force policy directives, instructions, and memoranda. The contractor would ensure adherence to all applicable Nellis AFB environmental plans.

Permits related to environmental concerns that would be required include, but may not be limited to, the following: *Clark County Surface Disturbance Permit* (dust permit); *General Storm Water Permit*. Among the Nellis AFB environmental plans that may be applicable to the proposed actions are *Nellis AFB Municipal Solid Waste Management Plan* (Jan 2003), *Nellis AFB Hazardous Material Management Plan* (December 2000), Nellis AFB Plan 19-1, *Facility Response Plan*, Volumes I & II (May 2002), and *Nellis AFB Water Management Plan* (May 2004).

The contractor would contact the 99th Civil Engineer Squadron/Environmental Management Flight (CES/CEV) for assistance in obtaining the appropriate permits and electronic copies of environmental plans. The contractor would obtain an Air Force Form (AFF) 103, *Base Civil Engineering Work Clearance Form*, from the 99th CES prior to any construction. The contractor would ensure that all materials purchased and used for construction and maintenance of the SPVS are approved through the HAZMART.

## 3.0 AFFECTED ENVIRONMENT

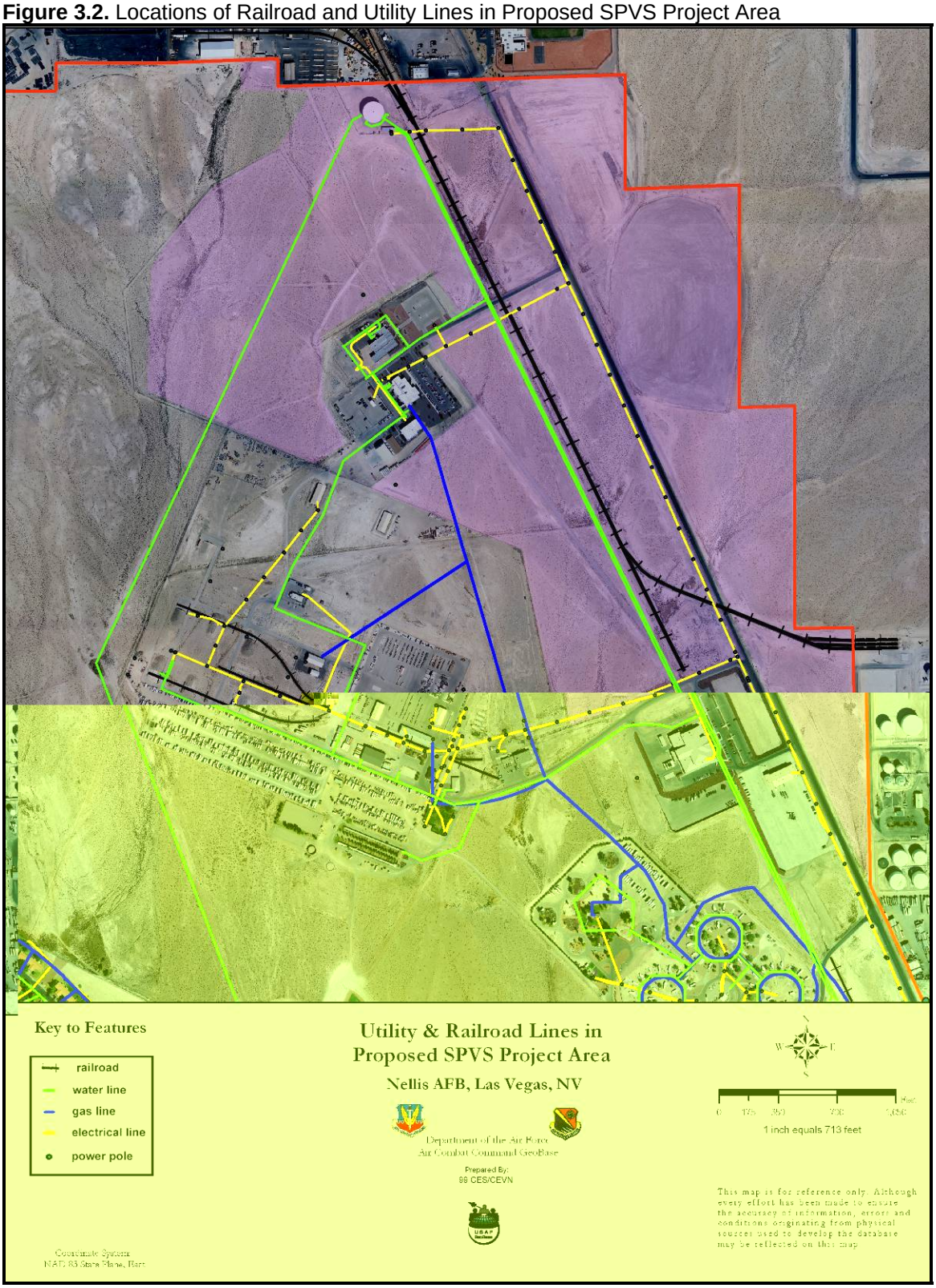
Based upon the nature of the activities that would occur under the proposed action and alternatives, Nellis AFB environmental program managers determined that the following resources could be affected: land use; air quality; water resources; safety; hazardous materials/hazardous waste; solid waste; biological resources; cultural resources; geology and soils including Environmental Restoration Program (ERP) sites; and socioeconomics. The potentially affected environment is described below.

### *3.1 Land Use*

The outgrant leased and sited land would be located on Nellis AFB in Area III, north of Las Vegas Blvd and south of I-15. Range Road bisects the acreage. Shallow, earthen, manmade drainages channel surface waters along the sides of Range Road. A railroad right-of-way running north to south bisects the acreage west of Range Road (Figure 3.1). Utility easements for gas, electrical, and sewage are located in the west portion of the proposed project area. Any rights-of-way, easements, and roads would be excluded from the proposed project area. These would be delineated through legal survey prior to Air Force lease of the land to the contractor. Figure 3.2 shows the locations of the utility and railroad lines

**Figure 3.1.** Railroad Right-of-Way through Proposed Project Area

**Figure 3.2.** Locations of Railroad and Utility Lines in Proposed SPVS Project Area



### *3.2 Air Quality*

Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. The federal Clean Air Act (CAA), 42 USC 7401-7671(q), as amended, stipulates that emissions sources must comply with the air quality standards and regulations that have been established by federal, state, and county regulatory agencies. These standards and regulations focus on the maximum allowable ambient pollutant concentrations and the maximum allowable emissions from individual sources.

The US EPA established the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide ($NO_2$), ozone, sulfur dioxide ($SO_2$), lead (Pb), and particulate matter equal to or less than 10 microns in diameter ($PM_{10}$). Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors. The concentration of ozone is not determined by direct measurement, but by the measurement of the precursors, nitrogen oxides ($NO_x$) and VOCs. The national and state ambient air quality standards are listed in Table 3.1.

The US EPA designates all areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Pollutants in an area may be designated as unclassified when there are insufficient ambient air quality data for the US EPA to form a basis for an attainment status. The Las Vegas area within Clark County is designated as being in serious nonattainment of the NAAQS for CO and $PM_{10}$. The primary source (96%) of CO emissions is vehicle traffic in the Las Vegas area. More than 60% of $PM_{10}$ emissions in the Las Vegas Valley are from fugitive dust from construction activities, unpaved roads, and disturbed vacant lands.

In areas where the NAAQS are exceeded, preparation of a State Implementation Plan detailing how the state would attain the standard within mandated time frames is required. Section 176c of the CAA provides that a federal agency cannot support an activity in any way unless the federal agency determines that the activity will conform to the State's plan for attaining and maintaining the NAAQS. In accordance with this part of the CAA, the US EPA announced its final conformity rule for general federal actions for nonattainment and maintenance areas in the *Federal Register*, November 30, 1993 (40 CFR Part 51). The final rule applies to Nellis AFB because the installation is situated within a nonattainment area for the NAAQS for CO and $PM_{10}$.

If emissions from a federal action do not exceed *de minimis* thresholds (based on the degree of nonattainment of the area), and if the federal action is not considered a regionally significant action, it is exempt from further conformity analysis. The applicable *de minimis* thresholds for Clark County are 100 tons/year for CO and 70 tons/year for $PM_{10}$. A regionally significant action is defined as one whose total emissions meets or exceeds 10% of the air quality control area's emission inventory for any criteria pollutant.

**Table 3.1.** National and Nevada Ambient Air Quality Standards

| Pollutant | Nevada[a][b] | National[a][b] | Standard Type[c][d] |
|---|---|---|---|
| Carbon Monoxide (CO) | | | |
| 8-hour Average | 9 ppm (10 mg/m$^3$)<br>6 ppm (6.67 mg/m$^3$)[e] | 9 ppm (10 mg/m$^3$) | Primary |
| 1-hour Average | 35 ppm (40 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | Primary |
| Nitrogen Dioxide ($NO_2$) | | | |
| Annual Arithmetic Mean | 0.053 ppm (100 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) | Primary & Secondary |
| Ozone ($O_3$) | | | |
| 8-hour Average[f] | --- | 0.08 ppm (157 µg/m$^3$) | Primary & Secondary |
| 1-hour Average | 0.12 ppm (235 µg/m$^3$) | 0.12 ppm (235 µg/m$^3$) | Primary & Secondary |
| Sulfur Dioxide ($SO_2$) | | | |
| Annual Arithmetic Mean | 0.03 ppm (80 µg/m$^3$) | 0.03 ppm (80 µg/m$^3$) | Primary |
| 24-hour Average | 0.14 ppm (365 µg/m$^3$) | 0.14 ppm (365 µg/m$^3$) | Primary |
| 3-hour Average | 0.50 ppm (1,300 µg/m$^3$) | 0.50 ppm (1,300 µg/m$^3$) | Secondary |
| Lead (Pb) | | | |
| Quarterly Average | 1.5 µg/m$^3$ | 1.5 µg/m$^3$ | Primary & Secondary |
| Particulate Matter Equal to or Less than 10 microns ($PM_{10}$) | | | |
| Annual Arithmetic Mean | 50 µg/m$^3$ | 50 µg/m$^3$ | Primary & Secondary |
| 24-hour Average | 150 µg/m$^3$ | 150 µg/m$^3$ | Primary & Secondary |
| Particulate Matter Equal to or Less than 2.5 microns ($PM_{2.5}$)[f] | | | |
| Annual Arithmetic Mean[f] | --- | 15 µg/m$^3$ | Primary & Secondary |
| 24-hour Average[f] | --- | 65 µg/m$^3$ | Primary & Secondary |
| Hydrogen sulfide ($H_2S$) | | | |
| 1-hour | 112 µg/m$^3$ | --- | |
| Visibility Observation | In sufficient amount to reduce the prevailing visibility to less than 30 miles when the humidity is less than 70 percent | --- | |

Notes:
(a) Standards other than for ozone and those based upon annual averages are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses.
(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the US EPA.
(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the US EPA approves the implementation plan.
(e) First standard applies at elevations less than 5,000 feet above MSL. The second standard applies at elevations equal to or greater than 5,000 feet above MSL.
(f) The ozone 8-hour standard and the $PM_{2.5}$ standard are included for information only. A 1999 federal court ruling blocked implementation of these standards, which the US EPA proposed in 1997. The ozone 8-hour standard has since been approved, but has yet to be implemented. A federal court ruling on the $PM_{2.5}$ standard is still pending.

| | |
|---|---|
| µg/m$^3$ | micrograms per cubic meter |
| mg/m$^3$ | milligrams per cubic meter |
| $PM_{2.5}$ | particulate matter equal to or less than 2.5 microns in diameter |
| $PM_{10}$ | particulate matter equal to or less than 10 microns in diameter |
| ppm | parts per million |

The baseline emission inventory for Nellis AFB is presented in Table 3.2. The Nevada's State Implementation Plan emission inventory for $PM_{10}$ and CO for Clark County is presented in Table 3.3. According to the baseline emission inventory for Nellis AFB, existing emissions of lead are zero and are not included in these tables.

**Table 3.2.** Baseline Emission Inventory (2001) Nellis AFB

| | (tons per year) | | | | |
|---|---|---|---|---|---|
| | $PM_{10}$ | CO | $NO_x$ | $SO_x$ | VOC |
| Total | 36.0 | 17.7 | 32.7 | 4.5 | 59.7 |

CO carbon monoxide
$NO_x$ nitrogen oxides
$PM_{10}$ particulate matter equal to or less than 10 microns in diameter
$SO_x$ sulfur oxides
VOC volatile organic compound

**Table 3.3.** Clark County Emissions for Criteria Pollutants

| | (tons per year) | | | | |
|---|---|---|---|---|---|
| | $PM_{10}$ | CO | $NO_x$ | $SO_2$ | VOC |
| Total Emissions | 333,133 | 168,825 | 43,004 | 2,064 | N/A |

CO carbon monoxide
N/A not applicable
$NO_x$ nitrogen oxides
$PM_{10}$ particulate matter equal to or less than 10 microns in diameter
$SO_2$ sulfur dioxide
VOC volatile organic compound

Nellis AFB holds a Title V / Part 70 permit for stationary emission sources including generators, internal combustion engines, abrasive cleaning, jet engine testing, fuel dispensing, welding, and surface coating. Mobile emission sources, such as aircraft and on-road vehicles, are not regulated by Title V of the CAA or the Clark County Part 70 permitting program (Nellis AFB, 2005).

## *3.3 Water Resources*

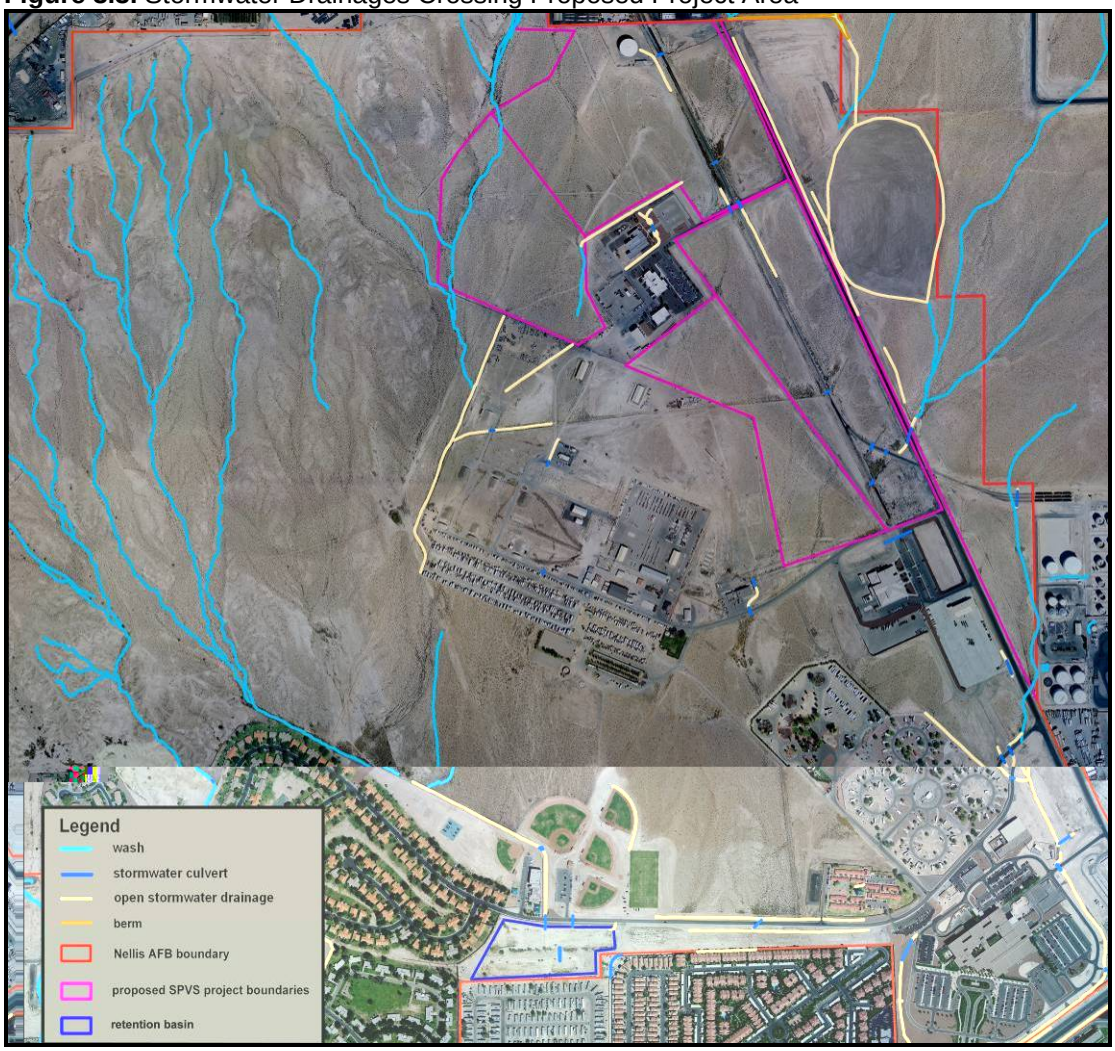
### Surface Waters

Surface waters found in the proposed SPVS project area are ephemeral streams (washes), defined as streams that receive 90% or more of their water from surface runoff. Washes are considered jurisdictional (subject to federal regulation) if they are connected to navigable waters of the US and they have a defined channel (*i.e.* exhibit the presence of ordinary high water marks characterized by bed and banks, scouring, or hydrophytic vegetation). Activities such as filling, re-channeling, or construction in waters of the US are regulated under Section 404 of the Clean Water Act (CWA).

The US Army Corps of Engineers (USACE) is the regulatory agency responsible for enforcing Section 404 of the CWA, and activities conducted in waters of the US may be subject to permits from the USACE. The nature, type, and amount of activity determine which projects are subject to regulation by the USACE. Projects impacting less than 0.5 acres of waters of the US may be subject to permitting through the USACE's Nationwide Permit program. Projects impacting larger areas of jurisdictional waters of the US may be subject to the USACE's Standard Individual Program.

Field observations and review of available data (Nellis AFB GeoBase GIS 2006; Nellis AFB, 2001) indicate that several washes and drainages cross the proposed SPVS project area (Figure 3.3). The drainages crossing the western portion of the proposed project area currently terminate in a retention basin that prevents stormwater from flowing any further. Stormwater is lost through percolation and evaporation. It seems unlikely that these washes would be considered jurisdictional waters.

**Figure 3.3.** Stormwater Drainages Crossing Proposed Project Area



The drainages on the eastern portion of the project area, however, flow through a series of detention basins that drain into Range Wash, located southwest of the proposed project area. Range Wash flows into the Las Vegas Wash, which ultimately carries surface waters into Lake Mead on the Colorado River (P. Quinn, Environmental Engineer, 99 CES/CEV, personal communication, May 2006). These washes might be considered jurisdictional waters.

### Groundwater

The Las Vegas Valley aquifer system is comprised of a shallow aquifer as close as 20 feet to the below ground surface (bgs) and three deeper principal aquifers located from 300 to 1,500 feet bgs. The shallow aquifer is unsuitable for use as a municipal water source due to contaminants, such as pesticides and fertilizers, that percolate through the alluvium into the system throughout the valley. Groundwater distributed in the municipal water supply is drawn from the deeper aquifer zones. The principal aquifers are protected from surface contamination by a thick layer of clay and fine-grained sediments throughout most of Las Vegas Valley (Nellis AFB, 2003; http://www.snwa.com/html/wr_lvgroundwtr.html, May 2006).

The Las Vegas groundwater basin is recharged from precipitation in the surrounding mountain ranges. Recharge is estimated to be up to 60,000 acre-feet of water per year. Throughout most of the valley, recharge occurs primarily from precipitation from the Spring Mountains and groundwater flows from west to east. On the east side of the valley, however, which includes the proposed SPVS project area, groundwater flows to the south/southeast (http://www.lasvegasgmp.com/ html/lv_gw.html, May 2006, Nellis AFB, 2003).

On Nellis AFB in the vicinity of the SPVS project area, multiple shallow, semi-confined aquifers occur at depths from 75 to 90 feet bgs. The confined aquifers are from a few inches to about five feet deep. Water levels are artesian and rise as high as 67 feet bgs (Nellis AFB, 2003). As throughout the rest of the Las Vegas Valley, these shallow aquifers are not used for municipal water supply.

## *3.4 Biological Resources*

### Vegetation

Vegetation in the proposed project area is a combination of native vegetation and invasive species. The creosote bush-white bursage (*Larrea tridentata-Ambrosia dumosa*) vegetative community, native to the Mojave Desert at lower elevations, dominates in areas that are relatively undisturbed. Desert globemallow (*Sphaeralcea ambigua*) and desert marigold (*Baileya multiradirata*) occur as isolated specimens. Barbwire Russian thistle (*Salsola paulsenii*) and cheatgrass (*Bromus tectorum*), noxious weeds found in disturbed areas, are common throughout the area. Figures 3.4 and 3.5 are photos of the vegetation observed in the proposed project area in May 2006.

**Figure 3.4.** Native Creosote Bush - White Bursage Community in the Proposed Project Area

**Figure 3.5.** Barbwire Russian Thistle in the Proposed Project Area

### Wildlife

A desert tortoise survey was conducted for the undeveloped land in Area III on August 10, 2004. All wildlife and signs of wildlife (*i.e.* scat, active burrows) observed during the survey were documented (Nellis AFB, 2004a). Table 3.4 lists wildlife encountered throughout Area III during the survey.

**Table 3.4.** Wildlife Species Observed in Area III During August 2004 Tortoise Survey

| **MAMMALS** | |
|---|---|
| **Common Name** | **Latin binomial** |
| Wood rat | *Neotama* ssp. |
| Audubon's cottontail | *Sylvilagus audubonii* |
| Black-tailed jackrabbit | *Lepus californicus* |
| **REPTILES** | |
| **Common Name** | **Latin binomial** |
| Long-nosed leopard lizard | *Gambelia wislizenii* |
| Whiptail | *Cnemidophorus* ssp. |
| Zebra tail lizard | *Callisaurus dracoinoides* |
| Horned lizard | *Phrynosoma coronatum* |
| Desert iguana | *Dipsosaurus dorsalis* |
| **BIRDS** | |
| **Common Name** | **Latin binomial** |
| Gambel's quail | *Callipepla gambelii* |
| Killdeer | *Charadrius vociferus* |
| Mourning dove | *Zeaisa macroura* |
| Burrowing owl | *Athene cunicularia* |
| Swift | *Apus* ssp. |
| Lesser nighthawk | *Chodeiles minor* |
| Hummingbird | Unidentified species |
| Horned lark | *Eremophila alpestris* |
| Say's phoebe | *Sayornis phoebe* |
| Ash-throated flycatcher | *Myiarchus cinerascens* |
| Western flycatcher | *Empidonax difficilus* |
| Rough-winged swallow | *Stelgidopteryx serripennis* |
| Ruby-crowned kinglet | *Regulus calendula* |
| Northern mockingbird | *Mimus polyglottus* |

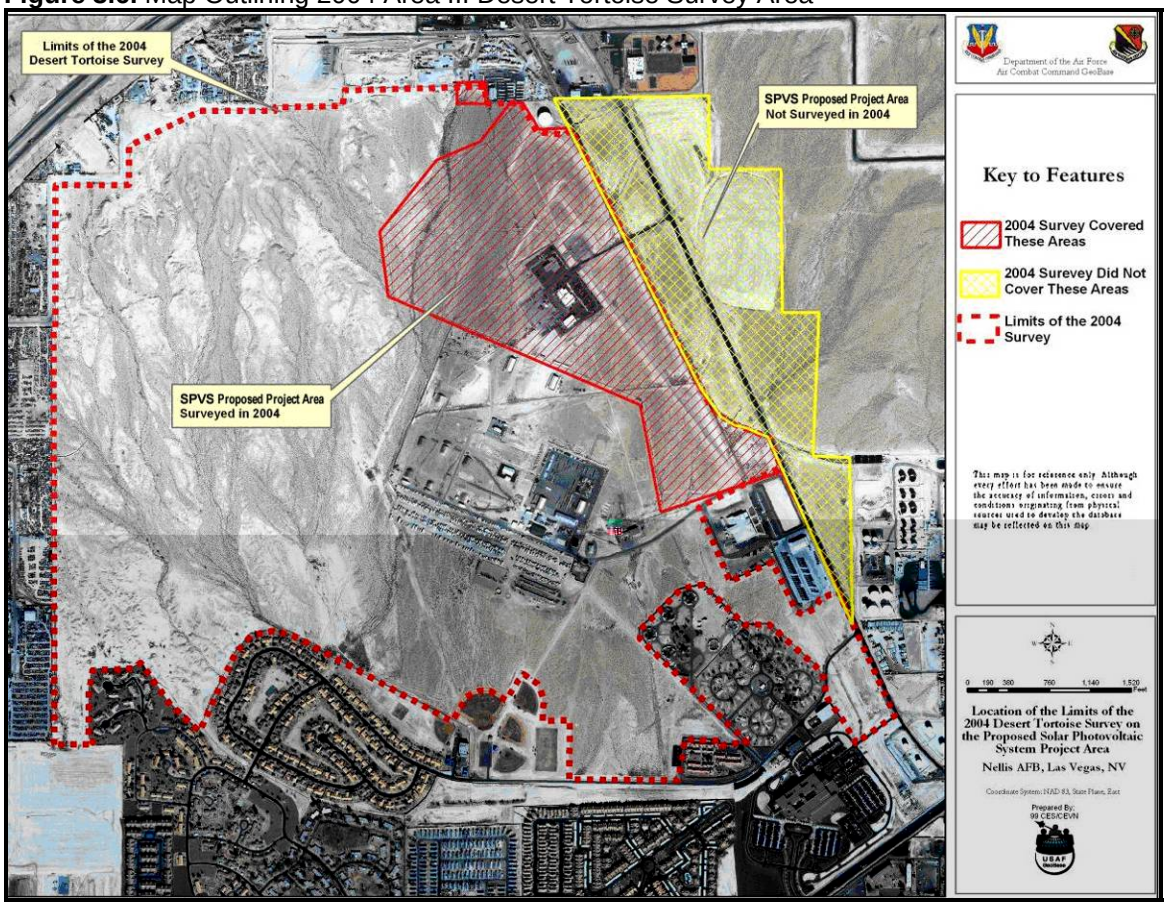
### Federally-Listed Threatened and Endangered Species

The purpose of the *Endangered Species Act of 1973*, as amended, is *to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions* regarding endangered species that the United States has with other countries. The Act protects all animal, plant, and insect species federally listed as threatened or endangered. The only federally-listed species occurring on Nellis AFB is the desert tortoise (*Gopherus agassazii*). The State of Nevada also lists the desert tortoise as threatened.

In August 2004, a desert tortoise survey was conducted in the undisturbed portions of Area III. The survey was conducted following established US Fish and Wildlife Service (USFWS) protocol. Transects were spaced 30 feet apart in areas of dense vegetation and 45 feet apart where vegetation was sparse (Nellis AFB, 2004a).

All of the proposed SPVS project area was surveyed with the exception of approximately 80 acres in the northeastern/eastern section. This area contains ERP site Nellis LF-02 and graded land adjacent to Range Road and the railroad. Figure 3.6 shows the Area III desert tortoise survey area. The unsurveyed area, which is completely disturbed (see Section 3.8 for detailed description of Nellis LF-02), does not support desert tortoise habitat (see Figures 3.5 and 3.11). Consequently, the Nellis AFB wildlife biologist determined that survey of that area was unwarranted (Nellis AFB, 2004a).

**Figure 3.6.** Map Outlining 2004 Area III Desert Tortoise Survey Area




Results of the 2004 survey indicate that Area III does not support populations of desert tortoise. Suitable habitat is marginal to non-existent. No desert tortoise or desert tortoise sign (*i.e.* scat, burrows) were located during the survey (Nellis AFB, 2004a). Thus, the proposed SPVS project area does not support any federally-listed threatened or endangered species.

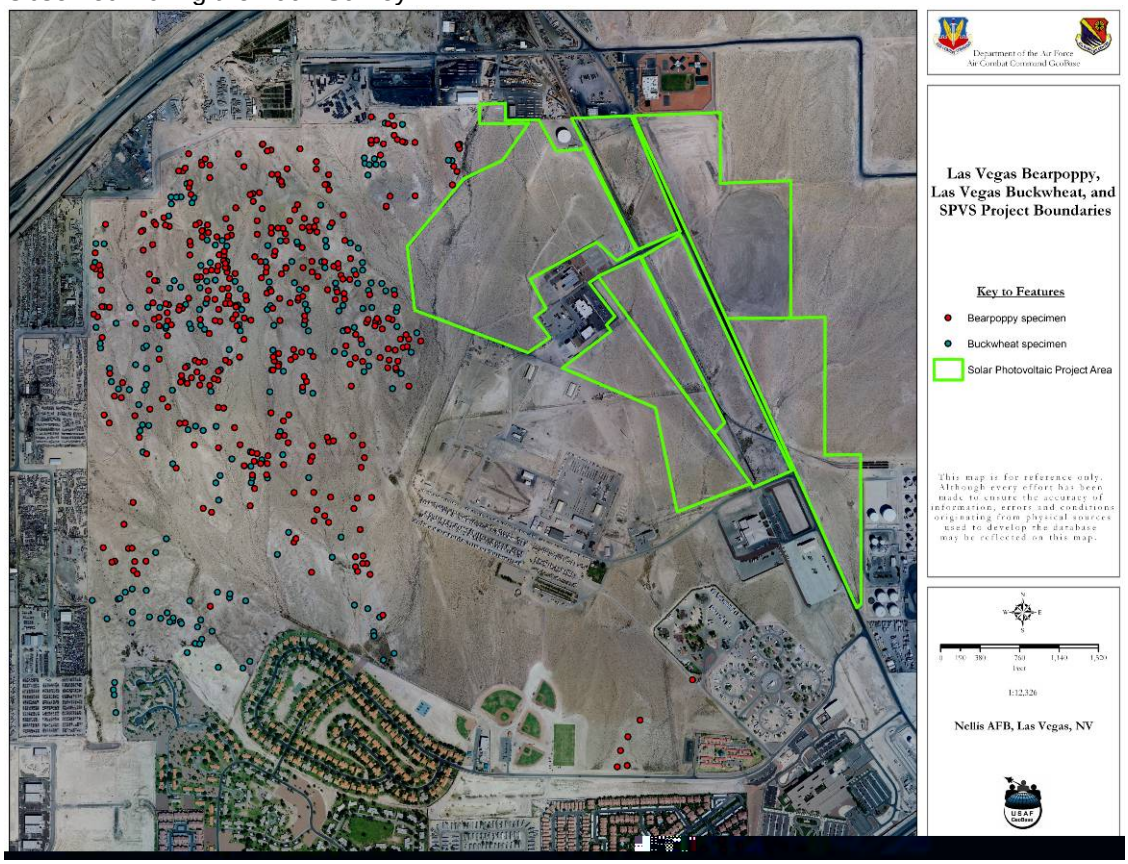
## Nevada State Fully-Protected Species

The Las Vegas Bearpoppy (*Arctomecon californica*), is fully-protected by the State of Nevada and a federal species of concern. The Nevada Revised Statutes mandate that prior to disturbance of any of the plants, developers must obtain a permit from the Nevada Division of Forestry. Forty-four percent (44%) of Nevada's Bearpoppy populations are *relatively secure under Federal management, rendering extinction of the species highly unlikely in the short term* (Mistretta *et al*., 1996).

Habitat for the species is restricted to soils with high gypsum content (up to 69%) and generally associated with creosote bush, saltbush (*Atriplex* ssp.), and blackbrush (*Coleogyne ramosissima*). Some of the Area III acreage provides suitable Las Vegas Bearpoppy habitat. In 2004, Area III was surveyed for populations of Las Vegas Bearpoppy. The survey was conducted concurrently with the desert tortoise survey and followed the same survey protocols (Nellis AFB, 2004b).

Specimens were observed west of the proposed SPVS project area in an area enclosed by chain-link fence. No Las Vegas Bearpoppy specimens were located in the proposed project area. Figure 3.7 outlines the area where results of the survey indicate Las Vegas Bearpoppy plants occur in Area III.

**Figure 3.7.** Map of Las Vegas Bearpoppy and Las Vegas Buckwheat Plant Locations Observed During the 2004 Survey



### Federal Protected Species

The Western burrowing owl *(Athene cunicularia hypugaea)* is a migratory bird inhabiting grassland, shrub-steppe, desert, and agricultural areas of the West. In Canada, the species is listed as endangered and in Mexico, threatened (Bibles and Dreitz 2006). The species is consequently protected under the *International Migratory Bird Treaty Act*.

Western burrowing owls occur throughout Nellis AFB. An Air Combat Command (ACC) base-wide study, conducted by the University of Arizona, was completed on Nellis AFB in May 2006. Significant populations were observed and studied in Area II at the southeastern installation boundary and on the golf course near the southern boundary. No burrowing owls were noted in Area III, although during the 2004 desert tortoise survey, three individuals were observed near the northwestern boundary of Area III. No burrowing owls were observed in the proposed SPVS project area (R. Turner, Nellis AFB Wildlife Biologist, 99 CES/CEV, personal communication, May 2006).

### Rare Plants

The Las Vegas Buckwheat (*Eriogonum corymbosum*), proposed for listing by the State of Nevada as critically endangered and on several watch lists, is a rare plant that occurs in Area III in habitat similar to the Las Vegas Bearpoppy (letter dated 24 March 2004 from R.D. Williams, USFWS Field Supervisor to R. Lopez, AFCEE, File No. 1-5-04-TA-455 and AF 6). Survey in Area III for Las Vegas Buckwheat was conducted concurrently with the 2004 Las Vegas Bearpoppy survey. Populations were found in the same areas as the Bearpoppy specimens. No Las Vegas Buckwheat plants were located in the proposed SPVS project area (Nellis AFB, 2004b).

## *3.5 Cultural Resources*

From 1990 to 2000, archaeological inventory was completed on the acreage comprising Nellis AFB. The archaeological inventories were conducted following Nevada SHPO standards and guidelines. Thirty-three archaeological sites were located and recorded on Nellis AFB. Site types were historic artifact scatters, prehistoric lithic scatters, military-associated artifacts, remnants of a minor historic trail, and a toolstone quarry. No sites were discovered in the proposed SPVS project area.

In 2001, a reevaluation of the cultural resources on the 23,000 acres comprising Nellis AFB was completed. One site, 26Ck4825, a toolstone quarry in Area II, was determined eligible for nomination to the *National Register of Historic Places*. All other sites were determined ineligible. The Nevada SHPO concurred with this determination on April 12, 2001. Table 3.5 lists the titles of the cultural resources documents and associated dates of Nevada State Historic Preservation Officer (SHPO) concurrence with determinations.

**Table 3.5.** Cultural Resources Inventories on Nellis AFB and SHPO Review Dates

| REPORT NAME | SHPO REVIEW / CONCURRENCE |
|---|---|
| *Inventory and Evaluation of the World War II Structures at Nellis Air Force Base and Indian Springs Air Force Auxiliary Field,* Sep 1988 | 14 Jun 91 |
| *Archaeology of the Main Cantonment*, Nellis AFB, Aug 1993 | 9 Feb 93 |
| *Class III Cultural Resources and Paleontological Surveys of the Small Arms Range, Nellis Air Force Base, Clark County, Nevada,* 1994 | 4 Apr 94 |
| *Archaeology of Areas II and III, Nellis Air Force Base, Clark County, Nevada,* Environmental Solutions, Inc., Irvine, California. National Technical Information Service, Department of Commerce, Washington, D.C., 1995 | 15 Mar 95 |
| *Phase II Archaeological Investigations at Sites 26CK4856, 26CK4864, and 26CK4867 within the Main Cantonment of Nellis Air Force Base, Clark County, Nevada. Las Vegas, Nevada*, Dames & Moore, Inc., 1995 | 24 May 95 |
| *Cultural Resources Inventory in Areas II and III*, Nov 00 | 3 Jan 01 |
| *Reevaluation of Archaeological Sites on Nellis Air Force Base*, Jan 01 | 12 Apr 01 |

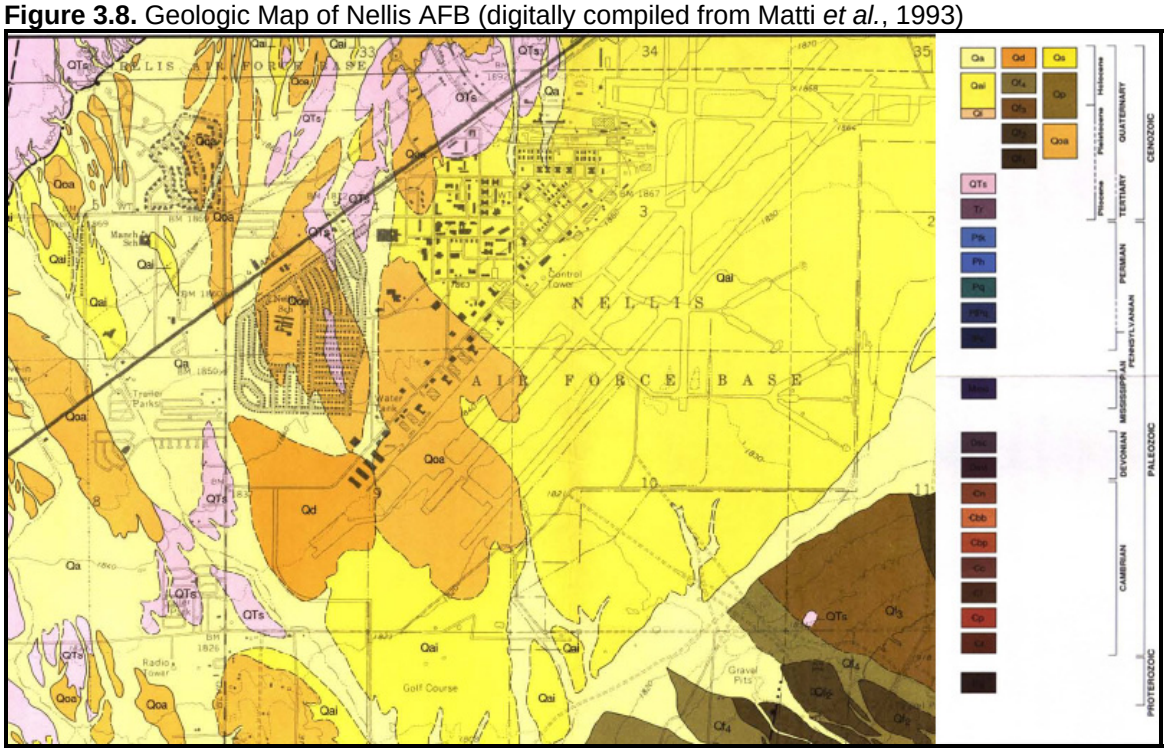
## *3.6 Geology and Soils*

### Geology

The Las Vegas Valley is located in the Basin and Range physiographic province, which is characterized by north-south trending mountain ranges enclosing basin-shaped valleys. Las Vegas Valley is somewhat atypical of the province, however, in that exterior drainage through the Colorado River occurs at the southeastern boundary. The valley is oriented diagonally, following a line of strong deformation indicated by the northwest to southeast orientation of the ranges (Longwell *et al*., 1965).

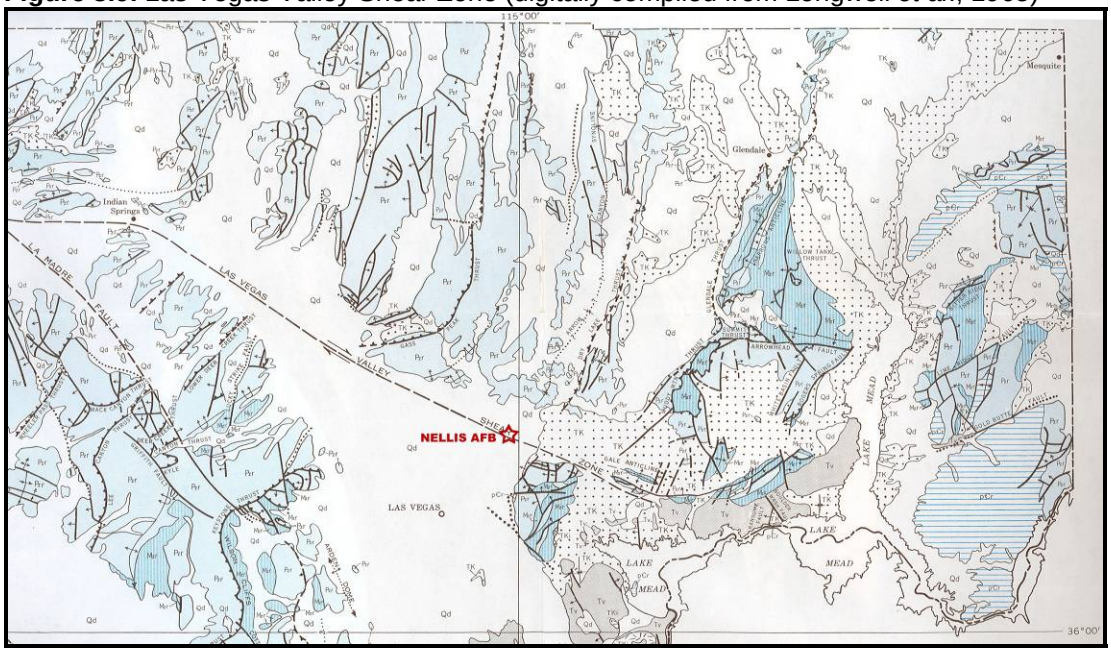
Like all of the province's valleys, recently deposited alluvium transported from the surrounding ranges form coalescing fans (*bajadas*) on Las Vegas Valley's margins and fill the valley floor (Longwell *et al*., 1965). At Nellis AFB, valley fill deposits are estimated to range from 2,000 to 5,000 feet thick (Nellis AFB, 2001). In the proposed project area, these deposits are primarily Quaternary Age active and intermittently-active unconsolidated alluvium composed of limestone and dolomite clasts. Sand-sized detrital gypsum is also present (Matti *et al*., 1993). Figure 3.8 is map illustrating the geology of Nellis AFB.

**Figure 3.8.** Geologic Map of Nellis AFB (digitally compiled from Matti *et al.*, 1993)




Nellis AFB is located on the Las Vegas Valley Shear Zone (Figure 3.9). Evidence for right lateral movement along this major fault is present on the north side of Sunrise Mountain (Longwell *et al*., 1965), which forms the southeastern installation boundary. The region has been designated as Seismic Hazard Zone 2B, an area that could experience earthquakes with intensities of MMI Level VII (Nellis AFB, 2005).

**Figure 3.9.** Las Vegas Valley Shear Zone (digitally compiled from Longwell *et al*., 1965)



**Soils**

A soil survey of Area III was conducted in May 2004 to gather habitat data for the Las Vegas Bearpoppy / Las Vegas Buckwheat survey. Three physiographic types were identified: 1) *Badlands*; 2) *Desert pavement*; and 3) *Disturbed areas*. The latter two types comprise the majority of the proposed SPVS project area (Nellis AFB, 2004b).

Soils in the proposed project area are of four distinct complexes. Comprising the majority of the area and located in the eastern two-thirds is the Las Vegas-Skyhaven Complex. This is a light brown clay loam with coarse limestone gravels capped with a desert pavement of caliche and limestone cobbles. The Weiser-Goodsprings Complex comprises the majority of the western third of the area, consisting of a light yellowish-brown sandy loam covered with a well-developed limestone cobble desert pavement exhibiting desert varnish (Nellis AFB, 2004b).

Located on the extreme west and central-north boundaries is the Las Vegas McCarran-Grapevine Complex. This is divided into two sub-units. Unit 1, found on hilltops, is a fine pink sandy loam containing minor gravels that include weathered lime and gypsum nodules. Unit 2 is a pink to yellowish-red fine sandy loam with an abundance of limestone and gypsum gravels cemented to form a stable surface (Nellis AFB, 2004b).

The fourth complex is not natural, but a manmade cap on an Environmental Restoration Program (ERP) site, Nellis LF-02, located in the northeast corner of the proposed project area. It is listed as *610: Pits, gravel* on the *Soil Survey of the Las Vegas Valley Area, Nevada Part of Clark County* map (Speck, 1985), shown in Figure 3.10. The engineered cap is a minimum of 24" in depth, comprised of native soils (Las Vegas-Skyhaven Complex) compacted to $10^{-7}$ cm/sec permeability (B. Schmidt, ERP Program Manager, 99 CES/CEV, personal communication, May 2006; P. Quinn, Environmental Engineer, 99 CES/CEV, personal communication, May 2006). The ERP site is discussed further in the following subsection.

**ERP Site, Nellis LF- 02.**

Prior to designation as an ERP site (Figure 3.11), LF-02 was a 33-acre solid waste landfill used by Nellis AFB from 1958 to 1966. Waste management operations at the landfill included both trench and area-fill methods of disposal. Debris discarded into the landfill included materials from building demolitions and other solid wastes. Wood buildings were reportedly buried in the southern portion of the landfill in 1966. Paint sludge from spray booths was also discarded in the landfill. A graded and compacted native soil cover, approved by the Nevada Department of Environmental Protection, was placed over the landfill in 1996 (Black & Veatch, 2006).

ERP site LF-02 currently has eight groundwater monitoring wells. Six wells are sampled annually and all eight wells are sampled every five years. The most recent annual sampling event occurred in September 2005. Only two contaminants of concern were detected, polychloroethene and trichloroethene. These solvents were detected in amounts below reportable US EPA maximum contamination levels (Black & Veatch, 2006).

**Figure 3.10.** Area III Section of Soil Survey Map (digitally compiled from Speck, 1985)

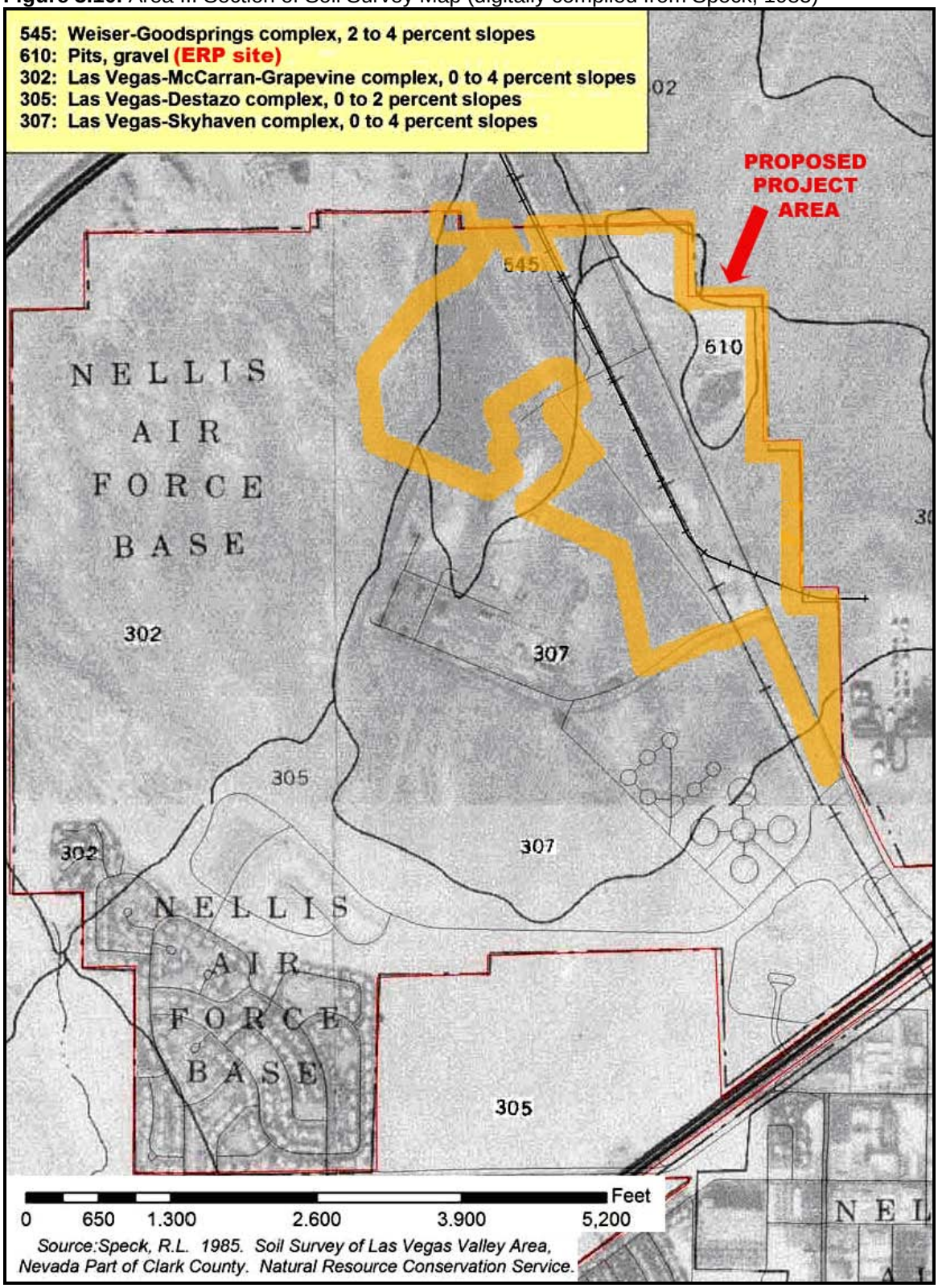
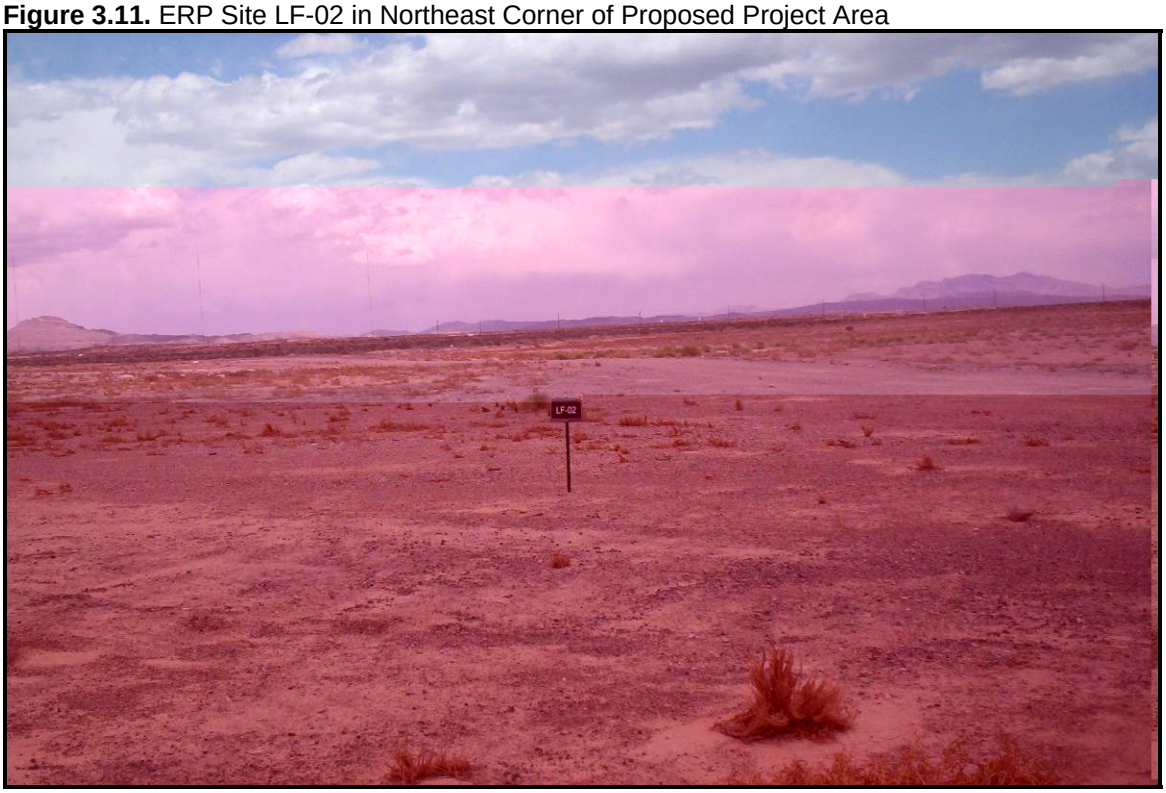


**Figure 3.11.** ERP Site LF-02 in Northeast Corner of Proposed Project Area




### *3.7 Socioeconomics*

Socioeconomics focuses on the general features of the local economy that could be affected by the proposed action and its alternatives. The primary socioeconomic aspect potentially affected by the proposed action would be power consumption. Nevada Power, a division of Sierra Pacific Corporation, supplies the Las Vegas Valley with the majority of its power. Currently, the electrical power used in the Las Vegas Valley during the summer when demand is at its highest averages about 5,900 MW per day (Illia, 2005).

Peak power use at Nellis AFB during the summer is slightly less than 30 MW per day, which is about 0.05% of the valley's total energy consumption. The proposed action would provide Nellis AFB with up to 30% of its total power requirements. This amounts to less than 0.02% of the Las Vegas Valley's total energy consumption.

# 4.0 ENVIRONMENTAL CONSEQUENCES

## *4.1 Air Installation Compatible Use Zone*

### Land Use

***Proposed Action.*** The acreage designated for the proposed action is currently segmented by utility and pipeline easements, a right-of-way, and roads. Outgrant lease of the remaining acreage would be similar to the legal status of those lands. The ability to construct Air Force facilities in the proposed project area is hampered by the segmentation of the property and the location of the ERP site. That construction of the SPVS requires only relatively small, shallow footings and minimal trenching allows for increasing Nellis AFB sustainability on what is otherwise virtually unusable installation acreage.

The proposed project area is surrounded by commercial development and vacant land slated for commercial development. The SPVS would have a similar industrial appearance. Thus, the aesthetic value of the area would remain the same.

***Alternative Action 1.*** Impacts would be the same as those described for the proposed action.

***Alternative Action 2.*** Impacts would be the same as those described for the proposed action.

***No-Action Alternative.*** There would be no change in land use under the no-action alternative.

**Noise.** Noise is often defined as any sound that is undesirable because it interferes with communication, damages hearing, diminishes the quality of the environment, or is otherwise annoying.

***Proposed Action.*** There would be no noise produced by the daily operation of the SPVS and thus, noise would be consistent with current levels. There would, however, be a temporary increase in noise during construction activities associated with the proposed action. This noise would be caused by heavy equipment, cutting tools, and other light construction activities. Noise would be confined to the construction area, which is surrounded by either unoccupied land or industrial development. The increase in noise would occur only during the short time necessary to install the SPVS. Construction noise would be comparable to noise generated from trucks and heavy equipment used in the surrounding commercial industries and thus, relatively insignificant.

***Alternative Action 1.*** Impacts would be similar to those described under the proposed action. Under Alternative Action 1, however, there would be a slight decrease in noise as trenching machinery would not be necessary.

***Alternative Action 2.*** Impacts would be the same as those described under the proposed action.

***No-Action Alternative.*** There would be no noise produced by the no-action alternative.

## *4.2 Air Quality*

***Proposed Action.*** Activities associated with the proposed action, including grading, construction, and operations, would not result in significant air quality impacts. There could be an increase in vehicle emissions associated with the travel of construction employees to and from the workplace, but these impacts would be minimal and not cause significant impacts.

Construction activities, such as grading and trenching, would cause a temporary increase in $PM_{10}$ emissions. $PM_{10}$ emissions were calculated using the US EPA Air Pollutant document, AP-42 (1995), *South Coast Air Quality Management District's California Environmental Quality Act Air Quality* (CEQA) *Handbook* emission factors. These emission factors are representative for the Clark County area. For mobile construction equipment, the *Sacramento Metropolitan Air Quality Management District Air Quality Thresholds of Significance* (1994) was used to calculate emissions of CO, $NO_x$, and VOCs. Emissions of CO, $NO_x$, and VOCs would be produced in exhaust from both on-site construction equipment and workers' vehicles traveling to and from the work site. Appendix A presents details on the air emission calculations used in this analysis. All emissions calculations were completed using the worst case scenario and included no natural mitigation measures.

**Table 4.1.** Proposed Action Construction Emissions for Criteria Pollutants

| *Year* | *$PM_{10}$* | *CO* | *$NO_x$* | *VOC* | *$SO_2$* |
|---|---|---|---|---|---|
| *2006* | 0.0750 | 0.4975 | 1.4955 | 0.1640 | 0.1570 |
| *2007* | 0.2250 | 1.4925 | 4.4865 | 0.4920 | 0.4710 |
| *De Minimis* | 70 | 100 | N/A | N/A | N/A |
| *Clark County* | 69,899 | 487,741 | 82,956 | 65,574 | 47,273 |

Note: $PM_{10}$ emissions include combustion and fugitive emissions, numbers are tons per year.

The emissions for the Proposed Action shown in Table 4.1 assume use of standard construction mitigation practices, such as watering exposed surfaces twice per day or frequently enough to keep the surface moist at all times, and watering haul roads three times a day to reduce dust and particulate emissions. According to the CEQA Handbook, regular watering of construction and demolition areas decreases $PM_{10}$ emissions by up to 75%. Proper vehicle maintenance is also assumed, which would reduce emissions of $NO_x$, PM10 and VOCs by 5%. Construction emissions would cause an elevated, short-term

increase in emissions at receptors close to the construction areas. However, federal regulations (40 CFR Part 70) consider fugitive and mobile sources exempt from a facility's emissions inventory. Thus, the Proposed Action would not affect the base's Title V / Part 70 permit for stationary emissions sources.

The increase in emissions from the Proposed Action is considered minimal when compared to the total emissions for Clark County in 1998. The emissions associated with the Proposed Action would increase countywide emissions by less than 1% annually and would not hinder maintenance of the NAAQS within the region of influence. Based on these findings, no significant impacts to air quality would occur from construction or operational activities associated with the Proposed Action.

Because Nellis AFB is in a nonattainment area for $PM_{10}$ and CO, an air conformity applicability analysis was conducted for the Proposed Action. Based on the serious nonattainment status for both these pollutants, the threshold for significant air pollutants is 70 tons/year for $PM_{10}$ and 100 tons/year for CO. As shown in Table 4.1, emissions generated by the Proposed Action would not exceed these thresholds in any year. These emissions also do not exceed 10% of the Clark County air emission inventory for these pollutants and, therefore, would not be regionally significant. Because these emissions would be *de minimis* and would not be regionally significant, a conformity determination is not required. The contractor would be required to obtain a *Clark County Surface Disturbance Permit* (dust permit) prior to construction.

***Alternative Action 1.*** Impacts would be similar to those discussed under the proposed action. The air emissions would vary slightly, however, as shown in Table 4.2.

***Alternative Action 2.*** Impacts would be the same as discussed under the proposed action.

***No-Action Alternative.*** There would be no effects to air quality under the no-action alternative.

**Table 4.2.** Alternative Action 1 Construction Emissions for Criteria Pollutants

| *Year* | $PM_{10}$ | *CO* | $NO_x$ | *VOC* | $SO_2$ |
|---|---|---|---|---|---|
| *2006* | 0.0715 | 0.4835 | 1.4480 | 0.1610 | 0.1525 |
| *2007* | 0.2145 | 1.4505 | 4.3440 | 0.4830 | 0.4575 |
| *De Minimis* | 70 | 100 | N/A | N/A | N/A |
| *Clark County* | 69,899 | 487,741 | 82,956 | 65,574 | 47,273 |

Note: $PM_{10}$ emissions include combustion and fugitive emissions, numbers are tons per year.

## *4.3 Water Resources*

### Surface Water

***Proposed Action.*** Grading associated with the proposed action could potentially affect storm water runoff. The contractor would be required to obtain a General Storm Water permit from the Nevada Bureau of Water Pollution Control prior to initiating any construction activity. The contractor would also be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) for the construction activity. The General Storm Water permit, together with the required SWPPP, would outline strict construction site best management practices (BMPs) designed to protect the quality of the surface water, groundwater, and natural environment through which they flow. The proposed action would not create a greater potential for flooding.

The proposed action would not impact jurisdictional waters of the US. Under the proposed action, minor grading would be completed to restore original grade to those areas where solar panel arrays are placed and trenching for conduit occurs. No solar panel arrays or conduit would be located in any of the drainages traversing the proposed project area.

***Alternative Actions 1 and 2.*** Effects would be the same as those described under the proposed action.

***No-Action Alternative.*** There would be no effects to jurisdictional waters or wetlands.

### Groundwater

***Proposed Action.*** Under the proposed action, there is no potential for direct contamination of groundwater. Activities associated with the operation and construction of the proposed action would not introduce any contaminants with the potential to affect groundwater. As discussed above, protection of groundwater would be addressed in the SWPPP. A portion of the proposed action would be built on a capped landfill ERP site. The integrity of the landfill would be maintained as discussed in section 4.5.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action

***No-Action Alternative.*** Under the no-action alternative, groundwater would not be affected.

## *4.4 Safety and Occupational Health*

### Ground Safety and Occupational Health

***Proposed Action.*** Effects to health and safety would be minimal. Under the proposed action, there would be an increased construction safety risk. This risk is an acceptable one associated with all construction activities. Materials containing asbestos would not be used under the proposed action and there would be no risk associated with radiation exposure. The proposed action is located outside all explosive clear zones.

The contractor would ensure that a site-specific Health & Safety Plan is developed for this project. Procedures for decontamination of heavy equipment would be established and enforced by the contractor. The contractor would provide for safeguarding base personnel and the public (*i.e*., conspicuous signage, security, air monitoring, etc.), and that AFF 103, *Base Civil Engineering Work Clearance Request*, is coordinated through 99 CES prior to initiation of any construction.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no effects to ground safety or occupational health.

### Flight Safety

***Proposed Action.*** No part of these actions would employ or influence airspace operations or air traffic management at or around Nellis AFB. The solar panels would have a non-glare surface and would not affect aviation activities. Construction, operation, and maintenance of the SPVS would not attract wildlife to the areas and thus, would not increase the bird/wildlife aircraft strike hazard at Nellis AFB. There would be no impact to flight safety under the proposed action.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no effects to flight safety.

## *4.5 Hazardous Materials/Waste and Solid Waste*

### Hazardous Materials and Hazardous Waste

***Proposed Action.*** The potential for affects from hazardous materials and hazardous waste associated with the construction and operation of the proposed action would be negligible. These would be likely to occur only in the event of construction or maintenance equipment (*i.e.* heavy equipment) malfunction or

damage in the form of petroleum, oils, and lubricants (POL) spills. Hazardous waste would be managed in accordance with Nellis Air Force Base Plan 12, *Hazardous Waste Management Plan*. Nellis AFB Plan 19-1, *Facility Response Plan*, Volumes I & II (May 2002) would be adhered to in the event of an accidental spill.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action

***No-Action Alternative.*** There would be no environmental effects caused by hazardous materials or hazardous waste.

**Solid Waste**

***Proposed Action.*** All solid waste produced during construction, operation, and maintenance of the proposed action would be removed from Nellis AFB and disposed of at an approved landfill. There would be a small amount of solid waste produced during construction, primarily packing materials and scrap wire. Operation and maintenance of the solar photovoltaic system would produce a negligible amount of solid waste and would also be removed from Nellis AFB by the contractor to be disposed of in an appropriate landfill.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no additional solid waste produced and no impacts.

## *4.6 Biological Resources*

***Proposed Action.*** In 2004, biological surveys focusing on desert tortoise, Las Vegas Bearpoppy, and Las Vegas Buckwheat were conducted in Area III. Survey methods followed protocols established by USFWS. All plant and animal species and signs that were observed were noted and recorded. No federal or Nevada state threatened or endangered species, protected species, or rare plants exist on the acreage designated for the proposed action.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no effects to threatened or endangered species under the no-action alternative.

## *4.7 Cultural Resources*

***Proposed Action.*** The project area for the proposed action contains no significant historic sites. The Nevada SHPO concurred with this determination on April 12,

2001. Thus, there will be no impacts to cultural resources as a result of the proposed action.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no effects to cultural resources.

## *4.8 Geology and Soils*

### Geology

***Proposed Action.*** The proposed action is unlikely to affect the local geology of the Nellis AFB area. No sedimentation patterns would be significantly altered and no structural movements or changes in seismicity would result. No significant impacts are anticipated.

***Alternative Actions 1 and 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** There would be no effect to local geology under the no-action alternative.

### Soils

***Proposed Action.*** Impacts to soil caused by the proposed action within Nellis AFB and its surrounding areas would be minimal and result primarily from ground disturbance associated with trenching conduit and digging footings for the solar panel arrays. These activities would alter soil profiles in the trenches and footings. The potential for soil erosion and sediment transport is not high in any of the areas that would be affected by the proposed activities since slope throughout the area is 0% to 4% (see Figure 3.10). The SWPPP discussed in Section 4.3 would identify BMPs to be used to control erosion during construction activities. The project grading plan, required prior to construction, will account for natural erosion that might occur after the proposed SPVS is constructed.

***Alternative Action 1.*** Effects for Alternative Action 1 would be similar to those described under the proposed action. Ground disturbance caused by trenching under Alternative Action 1 would be less than that produced by the proposed action, although digging of deep holes for emplacement of additional power poles might be required. These would cause slightly fewer impacts to soils than the proposed action.

***Alternative Action 2.*** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** Current conditions would remain the same.

**ERP Site, Nellis LF-02**

***Proposed Action.*** Nellis LF-02 is an ERP site and, therefore, subject to the following stipulations. Coordination with the Nevada Division of Environmental Protection's (NDEP) Bureau of Corrective Actions would occur for all construction activities on the ERP site. Although not anticipated, there is nominal potential that trenches or footings breaching the depth of the 24-inch (minimum) compacted-earth cap on the ERP site would be necessary. If this should become necessary, compliance with NDEP guidance to ensure that the integrity of the cap is maintained would be mandatory.

Compliance with NDEP guidance would be mandatory in the event that construction activities necessitated the removal of contaminated soils and materials from the ERP site. All soils removed from the ERP site and the exposed remaining soil (new surface layer) would be sampled and analyzed to determine contamination levels. Sampling, removal, and disposal of any contaminated materials would be at the contractor's expense. The Nellis AFB Restoration Program Manager (RPM) would assist in determining sampling requirements and supervise the efforts. At the contractor's expense and under supervision of the Nellis AFB RPM, any excavated area would be backfilled with clean fill, graded, and compacted to meet existing conditions.

Construction activities under the proposed action would avoid impacts to groundwater monitoring wells and Nellis AFB operations associated with those wells. Nellis AFB would continue to monitor the groundwater wells until such time as a *No Further Action Decision Document* is approved by NDEP. Once approved, Nellis AFB would abandon the monitoring wells in compliance with federal, state, and local regulations.

Construction contractors and site workers would be informed of the potential for encountering contaminated material on the ERP site. Safety observers currently certified with Occupational Safety and Health Administration (OSHA) 1910.120 *Hazardous Waste Operation and Emergency Response* (HAZWOPER) training would be on site during construction activities as necessary. The contractor would also ensure a monitoring program is in place during construction.

***Alternative Action 1.*** Effects would be similar to those described under the proposed action.

***Alternative 2.*** Effects would be the same as described for the proposed action.

***No-Action Alternative.*** There would be no impact to ERP site Nellis LF-02 under the no-action alternative.

## *4.9 Socioeconomics*

***Proposed Action.*** Nevada Power, the primary provider of electrical power to Southern Nevada, would no longer provide Nellis AFB with up to 30% of its electrical power requirements. This would account for less than 0.02% of the total amount of power that Nevada Power provides to the Las Vegas Valley. The Las Vegas metropolitan area population increased by 83.3% from 1990 to 2000 (US Census Bureau, 2001). Due to the sizeable and continuing population growth of the area, demands for power from Nevada Power will undoubtedly continue to increase despite the Nellis AFB decrease in demand resulting from the proposed action.

Nevada Power promotes development of independent solar power sources in southern Nevada. The company offers its customers rebates for installation of solar photovoltaic panels. Nevada Power's *Green Power Program* promotes research, development, and consumer use of alternative renewable energy sources (http://www.nevadapower.com/, May 2006). Installation of the proposed SPVS at Nellis AFB would support Nevada Power's energy use philosophies.

***Alternative Actions 1 and 2*****.** Effects would be the same as described under the proposed action.

***No-Action Alternative.*** Socioeconomics would remain the same. Nellis AFB would continue to analyze renewable energy source options to meet mandates of the Energy Policy Act of 2005 and DoD and Air Force energy policy goals.

## 5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are defined as the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource, such as fossil fuels or minerals, that cannot be replaced within a reasonable period. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as an archaeological site.

***Proposed Action.*** An insignificant amount of irreversible resource commitments and no irretrievable resource commitments would be required for the proposed action. Irretrievable resources necessary to accomplish the proposed action would primarily be fossil fuels for transport of construction items, as well as for operation of heavy equipment used to construct the SPVS. However, operation of the SPVS would ultimately produce a renewable energy source that would negate the amount of fossil fuels used to construct the system. Ultimately, the renewable power generated by operation of the SPVS would more than counterbalance the minimal demands on non-renewable energy resources required for vehicles used for construction and maintenance.

***Alternative Action 1.*** Effects would be the same as described under the proposed action.

***Alternative Action 2.*** Effects would be similar to those described under the proposed action.

***No-Action Alternative.*** There would be no use of irreversible or irretrievable resources for construction and maintenance activities under the no-action alternative. However, Nellis AFB would continue to use power generated from non-renewable resources until such time as an alternative method of acquiring renewable energy sources to augment the current power supply would be implemented. No action at this time would cause greater irreversible and irretrievable commitment of fossil fuels than would the proposed and alternative actions.

### *5.1 Cumulative Impacts*

Cumulative impacts are defined as *the incremental impact of actions when added to other past, present and reasonably foreseeable future actions, regardless of which agency (Federal or non-Federal or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time* (40 CFR §1508.7).

***Proposed Action.*** The primary impact to the environment would be a positive one that supports the Energy Policy Act of 2005. Because the solar photovoltaic system would provide Nellis AFB with up to 30% of its power requirements, there

would be a cumulative reduction in the depletion of non-renewable resources used to generate power over ensuing decades.

The proposed action would also demonstrate the feasibility of constructing and operating a large-scale SPVS in the region. The Nellis AFB SPVS would serve as a model to regional public and private decision makers that would likely influence future energy production decisions. If other southern Nevada government agencies, institutions, corporations, and private individuals began to rely on solar power, the cumulative positive effect on the environment would increase exponentially.

***Alternative Actions 1 and 2.*** Cumulative impacts would be the same as described for the proposed action.

***No-Action Alternative.*** The no-action alternative would cause no cumulative impacts to the environment from construction and maintenance of an SPVS. However, until such time as use of an alternative renewable energy source could be developed and implemented, the non-renewable resources used to produce power would not be curtailed at Nellis AFB. This would add to the increasing worldwide consumption of non-renewable energy resources.

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# Appendix A: Air Emissions Calculations

### *A.1 Mitigation Measures:*

***A.1.1.*** Water exposed surfaces twice per day resulting in a 68% $PM_{10}$ emission reduction.

***A.1.2.*** Properly maintain equipment resulting in a 5% reduction in ROG, $NO_x$, CO, $PM_{10}$ and $SO_x$ emissions.

***A.1.3.*** Water all haul roads three times per day resulting in a 75% $PM_{10}$ emission reduction.

### *A.2 Formulas Used*

#### *A.2.1 Equipment Emissions.*

Emissions (lb/day) = (lb of pollutant emitted per hour) (hours per day for each type of equipment operated)

**Where:**
Pounds of pollutant emitted per hour is based on specific emission factors for each type of equipment.

*Source: US Environmental Protection Agency 1985, Sacramento Metropolitan Air Quality*

#### *A.2.2 Fugitive Dust.*

$PM_{10}$ (lb/day) = (220 lb $PM_{10}$/acre-month)(month/22 days)(Acres graded per day)

**Where:**
It is conservatively assumed that the entire acreage is graded everyday.

*Source: South Coast Air Quality Management District, Midwest Research Institute, 1995*

## Appendix B: Interagency, Intergovernmental, and Public Coordination List

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Las Vegas, NV 89155-5210

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Peter Trust LP
MKB Company
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Las Vegas, NV 89102-4368

Mr. David Frear
Colliers International
3960 Howard Hughes Parkway, Suite 150
Las Vegas, NV  89109

Mr. Edward A. Rhodes, Sr.
Union Pacific Railroad
13181 Crossroads Parkway North, Room 500
City of Industry, CA  91746
Kinder Morgan Energy Partners, LP
1100 Town & Country Road
Orange, CA  92868

Clark County Library
1401 East Flamingo Road
Las Vegas, NV  89119

Sunrise Library
5400 Harris Avenue
Las Vegas, NV, 89110

## Appendix C: Interagency, Intergovernmental, and Public Comments

Nellis AFB received only one formal letter of comment for this EA. This letter, from Mr. John Mendoza, Clark County Department of Air Quality and Environmental Management, follows.

Mr. Rob Mrowka, Clark County Department of Air Quality and Environmental Management, contacted Nellis AFB and informally expressed that information drawn on the Figure 3.7 map that appeared in the draft EA was confusing. In response, the map was redrawn and Figure 3.7 replaced.

# Department of
# Air Quality & Environmental Management

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(702) 455-5942 • Fax (702) 383-9994

Christine L. Robinson, Director • Alan Pinkerton, Deputy Director • Lewis Wallenmeyer, Assistant Director


**Mike Estrada**
**99 ABW/PA**
**4430 Grissom Ave., Ste 107**
**Nellis AFB, NV 89191**

**Re: Draft Environmental Assessment (EA) Leasing Nellis Air Force Base Land for Construction and Operation of A Solar Photovoltaic System, Clark County, Nevada**

The Department of Air Quality and Environmental Management (DAQEM) reviewed the above document for any impacts to air quality. The project is proposed by the United States Air Force (Nellis Air Force Base). The proposed project is for construction of a solar photovoltaic system (SPVS). The project site is approximately 140 acres of a 207 area. The project site is located in a nonattainment area, Clark County Hydrographic Area 212 (Attachment A). Clark County is in nonattainment for Particulate Matter ($PM_{10}$), Carbon Monoxide (CO) and Ozone ($O_3$). The following comments are provided for the proposed project:

1. **Page 15, lines 5 and 42 of the EA.** To implement dust control for construction activities (includes trenching), projects larger than .25 acre and trenching larger than 100 feet require a dust control permit. Section 94 of the Air Quality Regulations (AQR) also recommends the use of the Dust Control Handbook to minimize impacts.

2. **Page 16, line 2 of the EA.** DAQEM encourages the proposed site being enclosed by fencing. The prevention of vehicular trespass to limit fugitive dust is stated Section 90 AQR.

3. **Page 16, line 3 of the EA.** The cleaning of the solar panels accomplished by water rinsing could serve two purposes (pending application method). First, the solar panels would be cleaned using water. Second, the area would actually be applied with a common mitigation measure during solar panel cleansing. Water rinsing as the primary means as opposed to blowing with compressed air is encouraged.

4. **Page 16, line 1 of the EA.** The on-site staging area could provide air quality mitigation because of the requirements of stabilization at project completion (Dust Control Handbook page 46).

5. Unpaved access roads to utilities to the site could be an issue with Section 91 AQR. In addition, comments #4 and #3 could indirectly minimize this impact.

The above comments are provided for consideration. DAQEM doesn't object to the proposed


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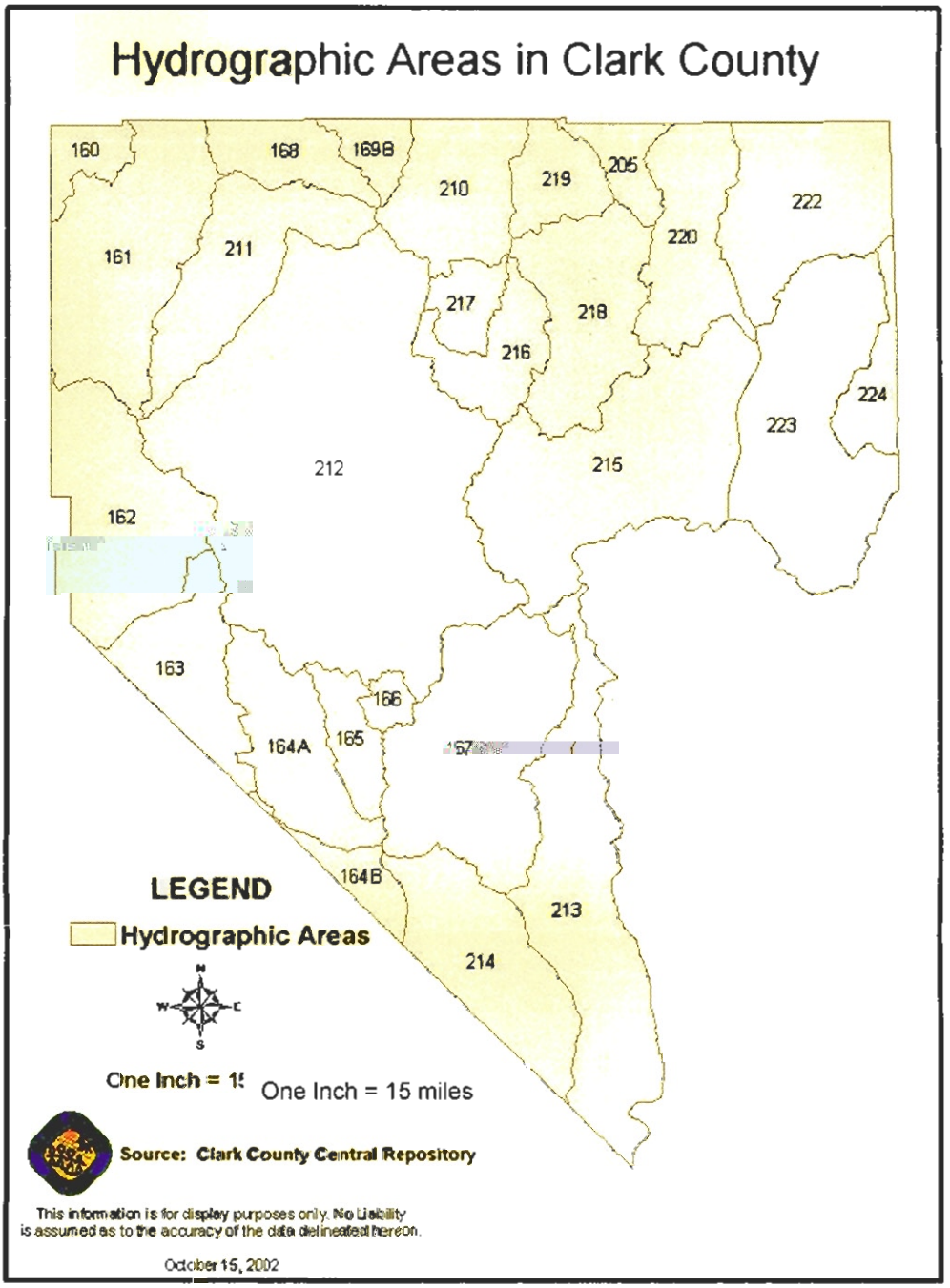
THOM REILLY, County Manager

action. The air quality regulations, forms and fees information is available on link **http://www.accessclarkcounty.com/air_quality/**. For more information please dial (702) 455-0287.

Sincerely,

John Mendoza, S. Planner
500 S Grand Central Pky
PO Box 555210
Las Vegas, NV. 89155

Cc: Michael R. Scott Colonel, USAF


Hydrographic Areas in Clark County
160
168
169B
210
219
205
222
161
211
220
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218
216
224
223
212
215
162
163
166
164A
165
164B
213
214
LEGEND
Hydrographic Areas
One Inch = 15 miles
Source: Clark County Central Repository
This information is for display purposes only. No Liability is assumed as to the accuracy of the data delineated hereon.
October 15, 2002