DRAFT ENVIRONMENTAL ASSESSMENT

OUTGRANT FOR CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM IN AREA I, NELLIS AIR FORCE BASE, CLARK COUNTY, NEVADA

U.S. AIR FORCE

October 2010

FINDING OF NO SIGNIFICANT IMPACT (FONSI) and FINDING OF NO PRACTICABLE ALTNERNATIVE (FONPA)

1. Name of Action.

OUTGRANT FOR CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM IN AREA I, NELLIS AIR FORCE BASE, CLARK COUNTY, NEVADA

2. Description of Proposed Action and Alternative Actions

Proposed Action:
The U.S. Air Force (USAF) proposes to initiate a renewable outgrant to Nevada Power Company d/b/a NV Energy or its designee, successor, or assignee (NV Energy), for approximately 160 acres of USAF property located at the southwest corner of Nellis Air Force Base (Nellis). A buried electric feeder line would be constructed either completely within USAF property boundaries or along the western perimeter of the base, primarily outside the perimeter fence, to transfer energy generated at the solar photovoltaic system (SPVS) to the Northgate Substation. NV Energy proposes to construct, operate, and eventually decommission the SPVS on the property proposed for outgrant by Nellis.

Solar panels would be constructed on both sides of Sloan Channel. During construction, a temporary crossing (i.e., culverts covered with roadbed fill material) would be placed in Sloan Channel to allow for construction access from E. Carey Avenue. A portion of the project area is a capped and closed landfill, and additional fill material would be brought onto the project area prior to the construction of solar panels to level and grade the landfill cap. Additionally, the closed golf course greens and abandoned fairways and hazards would be graded to create a level surface for placement of solar panels and conduits.

The SPVS would generate 10 to 15 megawatts alternating current, or up to 18 megawatts direct current. NV Energy could construct either fixed or one-axis type solar panels. The solar panels would be ballasted to minimize excavation. Conduits between the solar panels and the feeder line would be trenched in the landfill cap, but at a depth that would not penetrate the cap. NV Energy would potentially include energy storage (i.e., batteries) in the project design. Nellis would be the primary recipient of power generated by the SPVS, but some excess power may go to the electric grid when energy demand at Nellis is low. NV Energy would be the recipient of renewable energy credits as a result of the project.

To transmit power from the SPVS to Nellis, a feeder line would consist of a parallel run of 1,000 mcm (thousand circular mils size) cable buried in two 6-inch diameter underground conduits. The feeder line would be buried at a depth of 46 inches either completely within USAF property boundaries or along the western perimeter fence of Nellis. The new feeder line would tie into a 3-way switch placed on an existing riser pole located 400 feet from the Nellis Northgate Substation. Approximately 400 feet of existing buried cable between the riser pole and the Substation would be upgraded to match the new feeder installation.

Alternative Actions:
Although locating the SPVS off-site was considered by Nellis, the logical decision is that the SPVS be located on Nellis to provide cost effective renewable energy to Nellis. Any off-site locations would require land acquisition costs and additional feeder line runs to accommodate power transfer from the SPVS to Nellis. This reduces the cost effectiveness of the proposed project, making off-site locations for the SPVS not feasible.

Several alternative locations on Nellis were evaluated, but none have been determined to be reasonable due to their proximity to flight operations, or inadequate available area to support the SPVS. A site at the Nellis Small Arms Range was initially thought by Nellis to have the potential to support the SPVS. However, the Nellis Small Arms Range lacks appropriate infrastructure; the costs to Nellis and NV Energy would be substantially higher than the Proposed Action; the feeder line integration to an existing Nellis substation would traverse private property, highway rights-of-way and an active railroad; the Nellis Small Arms Range site is located near an active target range, increasing the risk of damage to solar panels from weapons training; suitable habitat for the desert tortoise (*Gopherus agassizii*) is present; and unexploded ordnance would require identification and removal before solar panel installation. Because of these issues, NV Energy and Nellis determined that the Nellis Small Arms Range site would not be a viable alternative, and it was dismissed from further consideration.

An alternative that was evaluated in the EA would eliminate trenching within the landfill cap to position interconnecting conduit between solar panels and the feeder line. Under this alternative, all interconnecting conduit would be located above-ground. This alternative would place all conduit above-ground between solar panels. The only trenching required would be to construct the feeder line outside the western perimeter fence of Nellis.

No Action Alternative:
Under the No Action Alternative, the USAF would not provide an outgrant of the 160 acres to NV Energy for construction and operation of a SPVS. However, the USAF at Nellis would continue to seek alternative methods to meet the Department of Defense and USAF requirements for increased use of renewable energy.

3. Summary of Environmental Resources and Impacts

Land Use: Land use would change from disturbed open space to a solar energy generating facility, but the land would remain as a military reservation. A reduction in visual resources would occur at the proposed project area from placing solar panels in disturbed open space. Reflectivity studies indicate that solar panel reflectivity is no greater than weathered concrete; therefore, no impacts would occur from sunlight reflection.

Geology and Soils: Up to 160 acres of soils would be disturbed, but erosion control measures would make the impacts insignificant.

Air Quality: Short-term and minor impacts on air quality would occur during construction; dust suppression and vehicle maintenance would minimize impacts.

Noise: Noise would be generated during the construction of the SPVS, and construction noise contours greater than 65 dBA and less than 75 dBA would extend into adjacent residences and a public park. Although the delivery of materials to the site could occur at any time during construction activities, active construction would only occur during daylight hours to minimize impacts to day/night noise levels.

Water Resources: Minor short-term impacts on Sloan Channel would occur during the placement of a temporary crossing. Appropriate Clean Water Act permits would be acquired by NV Energy, and associated mitigation measures would minimize impacts on waters of the U.S.

Biological Resources: No native biological resources exist in the project area; therefore, there would be no significant impacts on vegetation. Impacts on wildlife populations would be minimal. Abandoned ground squirrel burrows exist in the project area in both the landfill and the golf course; these burrows are actively used by burrowing owls. The loss of active burrows and man-made burrowing owl burrows would occur; however, mitigation measures to allow for passive owl relocation to off-site man-made burrows would reduce the impacts on this species. To avoid impacts on ground-nesting birds, surveys for active nests or nesting activity would be conducted prior to construction should clearing and grubbing occur during the nesting season.

Socioeconomics: Socioeconomic and Environmental Justice issues would be insignificant, since benefits such as more available energy, reduced costs and improved air quality associated with increased use of renewable energy would accrue to all citizens in the area affected.

Hazardous and Toxic Substances: No hazardous materials are located on the project site. The closed and capped landfill would not be penetrated by construction activities and the depth of the landfill cap would be increased. Hazardous materials management and Spill and Pollution Prevention Plans would be implemented during construction and use.

Safety: Safety response for the property would remain with Nellis and the security fence would remain in place. Reflectivity from solar panels would be no greater than weathered white concrete and would not increase glare on aviators approaching or departing the airfield. No significant safety impacts would occur.

Cumulative Impacts: No significant adverse cumulative impacts would result from the Proposed Action, and beneficial cumulative effects would result for Nellis through a long-term stability in energy costs and use of renewable energy.

4. Conclusions

Executive Order 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management, provide that if a Federal agency proposes to conduct an activity in a wetland or floodplain, it will consider alternatives to the action and modify its actions, to the extent feasible, to avoid adverse effects or potential harm. Alternatives have been considered to avoid and minimize impacts on wetlands, waters of the U.S. and floodplains. The Proposed Action would place a temporary road crossing in Sloan Channel, which would have impacts on a jurisdictional waters of the U.S. Because solar panels and construction equipment would need to be transported from the construction entrance across Sloan Channel, and no alternative access to this project area is available without increased disturbance to drainage features and residences, the temporary crossing is required for construction activities. The temporary crossing would be designed and constructed to allow for unimpeded flows in Sloan Channel, and would be removed at the end of construction activities. Sloan Channel would be restored to pre-construction conditions. USAF finds that there are no practicable alternatives to construction activities in Sloan Channel for the Proposed Action. USAF further finds that all practicable measures have been taken to minimize harm to wetlands, waters of the U.S. and floodplains, and that proposed minimization measures are documented in the EA.

Based on the analysis and conclusions presented in the EA, conducted in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and Air Force Environmental Impact Analysis Process, as promulgated in Title 32 of the Code of Federal Regulations Part 989, and after careful review of the potential impacts, I

conclude that implementation of the Proposed Action or the Alternative Actions would result in no significant impacts on the quality of the human or natural environments. Therefore, a Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA) are warranted, and an Environmental Impact Statement (EIS) is not required.

_____ _____

Dave C. Howe Date
Brigadier General, USAF
Director of Installations and Mission Support

DRAFT

ENVIRONMENTAL ASSESSMENT
OUTGRANT FOR CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM IN AREA I, NELLIS AIR FORCE BASE, CLARK COUNTY, NEVADA

Public comments on the draft Environmental Assessment (EA) are requested pursuant to the National Environmental Policy Act, 42 United States Code 4321, et seq. All written comments received during the comment period will be considered during preparation of the final EA. Private address information provided with comments will be used solely to develop a mailing list for the final EA distribution and will not be otherwise released.

United States Air Force

October 2010

ENVIRONMENTAL ASSESSMENT
OUTGRANT FOR CONSTRUCTION AND OPERATION OF
A SOLAR PHOTOVOLTAIC SYSTEM IN
AREA I, NELLIS AIR FORCE BASE,
CLARK COUNTY, NEVADA

a. Responsible Agency: U.S. Air Force

b. Proposed Action: The U.S. Air Force (USAF) proposes to initiate an outgrant to Nevada Power Company d/b/a NV Energy or its designee, successor or assignee (NV Energy) for approximately 160 acres of USAF property located at the southwest corner of the base. The property is currently developed, with a portion functioning as a closed and capped landfill on the east side of Sloan Channel and a portion as a closed section of the golf course west of Sloan Channel. A solar photovoltaic system (SPVS) would be constructed on either side of Sloan Channel. Energy generated from the SPVS would be sold to Nellis Air Force Base (Nellis) at a predetermined fixed price. An underground electric feeder line would also be constructed along the western perimeter of the base, primarily outside the perimeter fence, to transfer energy generated at the SPVS to the Nellis Northgate Substation. NV Energy proposes to construct, operate, and eventually decommission the SPVS on the property proposed for outgrant by USAF.

c. Written comments and inquiries regarding this document should be directed to:
99 ABW/PA
4430 Grissom Ave, Suite 107
Nellis Air Force Base, NV 89191
ATTN: Mr. Charles Ramey

In addition, the document can be viewed and downloaded from the World Wide Web at:
www.nellis.af.mil/library/environment.asp

A hard copy is available for review at:
Las Vegas Library, Reference Department
833 Las Vegas Blvd. North
Las Vegas, NV 89101

d. Report Designation: Draft Environmental Assessment (EA)

e. Abstract: This EA evaluates the potential environmental impacts for the outgrant of 160 acres of USAF property to NV Energy. The SPVS project would generate 10 to 15 megawatts alternating current, or up to 18 megawatts direct current. NV Energy would construct either fixed or one-axis type solar panels. The SPVS would be constructed on both sides of Sloan Channel, on a former landfill that has been closed and capped, and on closed fairways and greens of a former golf course. Some importing of fill material would be needed to level the closed landfill, and the former golf course area would be graded level. Conduits would be trenched between solar panels and a feeder line would be placed below-ground from the SPVS to the Nellis Northgate Substation.

This EA has been prepared in accordance with the *National Environmental Policy Act* (NEPA) and 32 CFR 989, the *Air Force Environmental Impact Analysis Process* (EIAP) to analyze the potential environmental consequences of the Proposed Action, a Modified Conduit Connection Alternative that would place all conduits between solar panels

above-ground, and the No Action Alternative. Under the No Action Alternative, no outgrant on USAF lands would be initiated, the SPVS would not be constructed and no additional renewable energy at a fixed price from a SPVS in Area I would be made available to Nellis.

The environmental resources potentially affected by the Proposed Action are land use, air quality, noise, water quality, special status species, and socioeconomic conditions. Based on an analysis of affected resources and mitigation measures to be employed, no significant impacts on any of the affected resources would occur as a result of the Proposed Action. Further, substantial economic benefits for Nellis would result from the Proposed Action, and would increase the use of renewable energy for the USAF. NV Energy would retain all of the renewable energy attributes of the energy.

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ACRONYMS AND ABBREVIATIONS

AC	alternating current
ACHP	Advisory Council on Historic Preservation
ASTM	American Society for Testing and Materials
BAQ	Bureau of Air Quality
bgs	below ground surface
BMP	best management practice
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
dB	decibel
dBA	decibel, A-weighted
DC	direct current
DCNR	Department of Conservation and Natural Resources
DNL	Day/Night Average Sound Level
DoD	Department of Defense
DOPAA	Description of Proposed Actions and Alternatives
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EISA	Energy Independence and Security Act
EIS	Environmental Impact Statement
EO	Executive Order
EPAct	Energy Policy Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
GHG	greenhouse gases
GSRC	Gulf South Research Corporation
HFC	hydrofluorocarbons
HUD	U.S. Department of Housing and Urban Development
I-15	Interstate 15
mcm	1000 circular mils
mg/m^3	milligrams per cubic meter
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NDCNR	Nevada Department of Conservation and Natural Resources
NDEP	Nevada Department of Environmental Protection
NEPA	National Environmental Policy Act
NHTSA	National Highway Safety Administration
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places

NRS	Nevada Revised Statutes
NO_2	nitrogen dioxide
O_3	ozone
OSHA	Office of Safety and Health Administration
Pb	lead
PCFs	perfluorocarbons
PCI	Per Capita Income
PL	Public Law
PM-2.5	particulate matter equal or less than 2.5 microns in diameter
PM-10	particulate matter equal or less than 10 microns in diameter
ppm	parts per million
SO_2	sulfur dioxide
SF_6	sulfur hexafluoride
SPCCP	Spill Prevention Control and Countermeasures Plan
SPVS	Solar Photovoltaic System
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
$\mu g/m^3$	micrograms per cubic meter
UNLV	University of Nevada Las Vegas
U.S.C.	United States Code
USCB	U.S. Census Bureau
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WRF	wastewater recycling facility

SECTION 1.0
PURPOSE, NEED, AND SCOPE

1.0 PURPOSE, NEED, AND SCOPE

This Environmental Assessment (EA) has been prepared to comply with the *National Environmental Policy Act* (NEPA) of 1969 (Public Law [PL] 91-190; 42 U.S. Code [U.S.C.] 4321-4347), as amended. Preparation of this EA followed instructions established in 32 Code of Federal Regulations [CFR] 989, *Environmental Impact Analysis Process* (EIAP) for the U.S. Air Force (USAF), and 40 CFR 1500-1508, *Council on Environmental Quality* (CEQ) regulations. For the purposes of this document, "NV Energy" shall refer to Nevada Power Company d/b/a NV Energy or its designee, successor or assignee.

This EA evaluates potential impacts of Federal actions associated with the outgrant of approximately 160 acres of USAF lands on Nellis Air Force Base (Nellis) (Figure 1-1 and Figure 1-2) to NV Energy for the construction and operation of a solar photovoltaic system (SPVS). NV Energy would construct, operate and own the SPVS, and would sell the energy directly to Nellis. It is anticipated that all power generated from the SPVS would be purchased by Nellis; however, if some power is available beyond Nellis' needs, this power would flow into the grid and be reallocated by the utility to other consumers.

1.1 INTRODUCTION

The Energy Policy Act of 2005 (PL 109-58), (EPAct); Executive Order (EO) 13423, January 24, 2007 on Strengthening Federal Environmental, Energy, and Transportation Management; and EO 13514, October 5, 2009 on Federal Leadership in Environmental, Energy and Economic Performance address the Nation's growing energy problems, which include increasing crude oil costs, diminishing supplies worldwide, and dependency on foreign crude oil sources. Any reduction of crude oil consumption would be the result of reduced costs associated with transporting coal from a mine to a power plant. The EPAct and EO 13514 require numerous energy saving and conservation measures. The EPAct mandates that Federal agencies will lead the way in renewable energy, with a goal of utilizing 7.5 percent or more renewable energy by 2013. Solar power is one of the renewable energy resources supported by the EPAct.

The 2008 *United States Air Force Infrastructure Energy Strategic Plan* (Energy Strategic Plan) outlines the USAF strategy to meet energy conservation mandates, establish energy independence, and provide the means to acquire resources necessary to make installations energy efficient. The USAF energy vision is to "reduce demand through conservation and efficiency; increase supply through alternative energy sources; and create a culture where all Airmen make energy a consideration in everything we do" (USAF 2008a). USAF's policy is to consider energy conservation in all of its activities.

The USAF is the largest purchaser in the Federal government of clean energy, and ninth largest purchaser in the U.S. (U.S. Environmental Protection Agency [USEPA] 2010). Currently 4 percent of the electricity used by the USAF is produced from renewable resources, and the USAF has received a Green Power Leadership award from the USEPA (USEPA 2010, EO 13423, Energy Independence and Security Act of 2007 [EISA]).

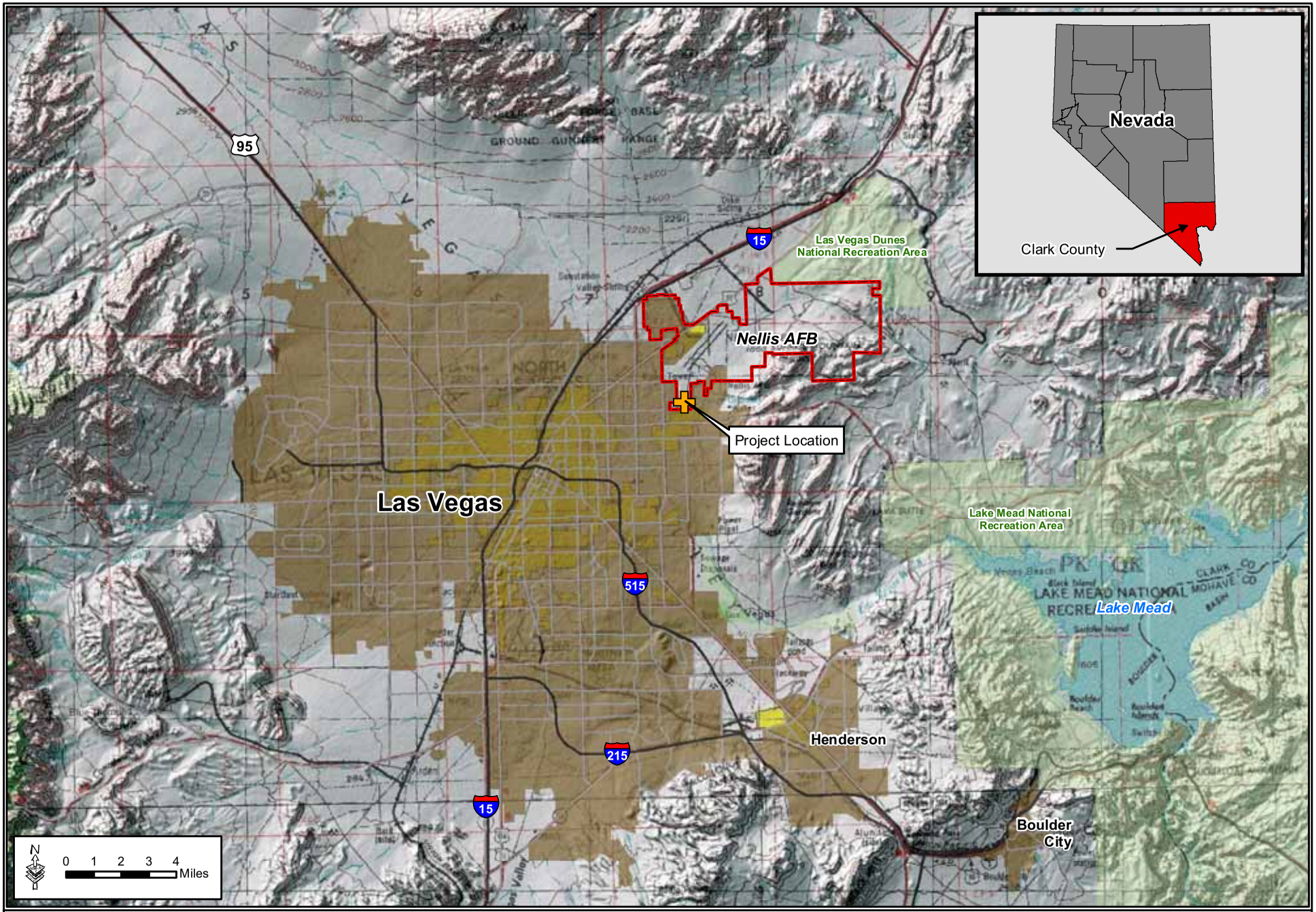

Figure 1-1: Vicinity Map

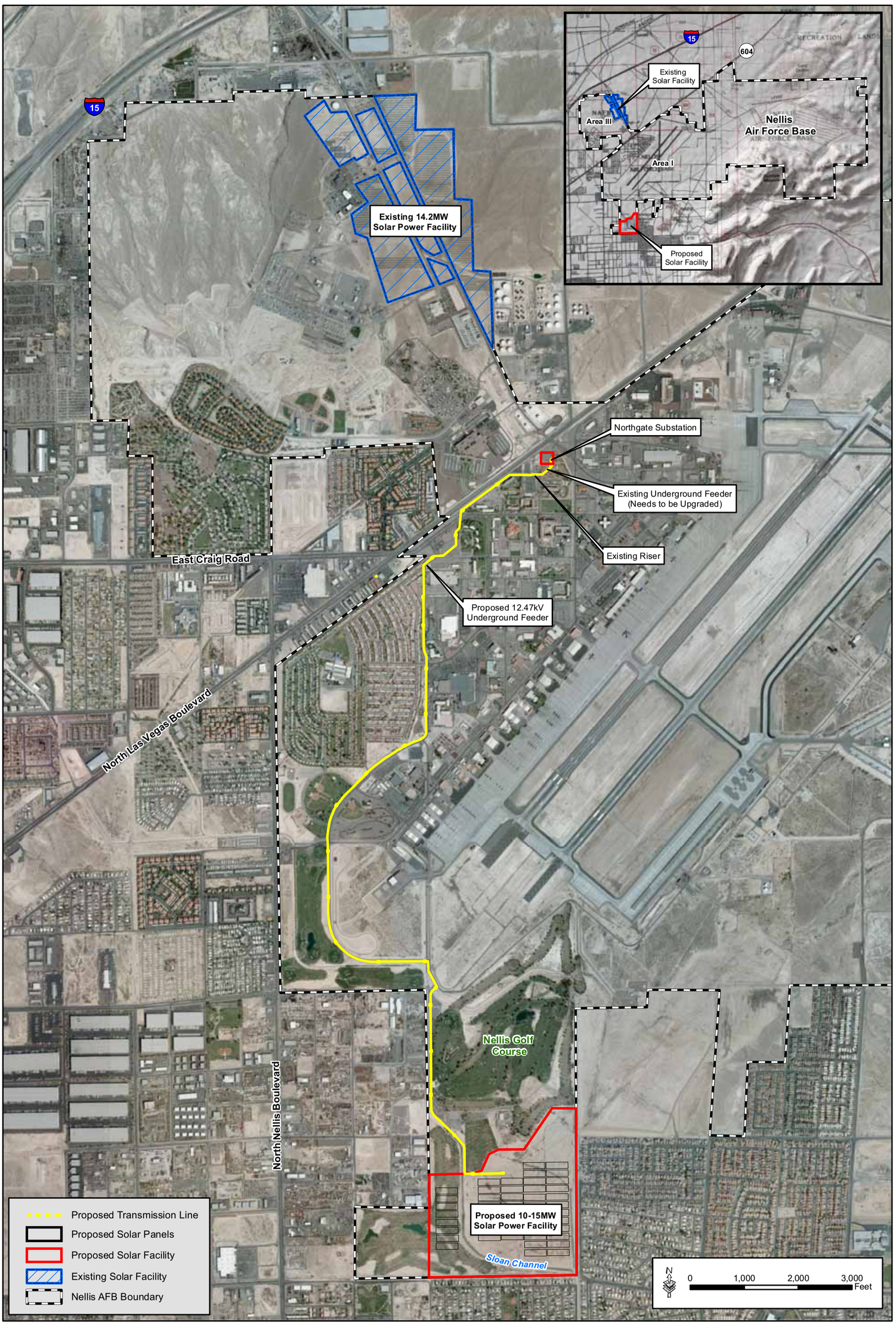

Figure 1-2: Proposed Action Site

Currently, NV Energy provides approximately 65 percent of the electrical energy consumed by Nellis from its existing fleet of generating facilities. In December 2007, a private company leased a 140-acre parcel in Area III on Nellis to construct an SPVS (Photograph 1-1). The USAF purchases the generated power from this SPVS and NV Energy purchases the renewable energy credits. This SPVS generates 14.2 megawatt (direct current [DC]) peak output, and currently provides 25 to 30 percent of annual electricity for Nellis. The SPVS saves the USAF approximately $1 million annually in energy costs.

Photograph 1-1. SPVS at Area III on Nellis AFB constructed in 2007.

Nellis proposes to use solar energy to meet the Federal government's requirements that continue to focus on more renewable energy resources. As a partner, NV Energy, or any successor or assign, would own and operate the proposed SPVS in Area I. In turn, NV Energy would be generating energy from a renewable resource which would in turn be sold to Nellis through its applicable tariff rate (however NV Energy would retain all of the renewable energy attributes of the energy).

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to increase the use of renewable energy at Nellis in compliance with the USAF Energy Strategic Plan, EPAct, EISA, EO 13423, and EO 13514. The need for the Proposed Action is to decrease Nellis energy costs, stabilize future energy costs, reduce energy demand from non-renewable resources, and to meet Congressional and Department of Defense (DoD) requirements coupled with meeting long-term goals for renewable energy use set by the USAF.

1.3 SCOPE

This EA identifies, documents, and evaluates potential environmental effects of the proposed outgrant of USAF lands for construction and operation of a SPVS in Area I. Pursuant to a contractual arrangement, NV Energy would sell the output of its solar facility to Nellis pursuant to its applicable tariff (however NV Energy would retain all of the renewable energy attributes of the energy). This EA was prepared for the USAF, and the Proposed Action considered by Nellis includes a proposed renewable outgrant of the 160 acres of Nellis lands required for the SPVS in Area I.

SECTION 2.0
PROPOSED ACTION AND ALTERNATIVES

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The USAF proposes to initiate a renewable outgrant to NV Energy for approximately 160 acres of USAF property located at the southwest corner of the base (see Figure 1-2). A buried electric feeder line would be constructed along the western perimeter of Nellis, primarily on USAF property, to transfer energy generated at the SPVS to the Nellis Northgate Substation. NV Energy proposes to construct, operate, and eventually decommission the SPVS on the property proposed for outgrant by Nellis.

Solar panels would be constructed on both sides of Sloan Channel within the 160-acre project area (see Figure 1-2). During construction, a temporary crossing (i.e. culverts covered with roadbed fill material) would be placed in Sloan Channel to allow for construction access from E. Carey Avenue. The culverts would be removed and the Sloan Channel bed and banks restored following construction. A portion of the project area is a capped and closed landfill, and construction would not penetrate the landfill cap. Additional fill material would be brought onto the project area prior to the construction of solar panels to level and grade the landfill cap. This would rectify drainage and surface leveling issues associated with uneven subsidence of the landfill cap. Additionally, the closed golf course greens and abandoned fairways and hazards would be graded to create a level surface for placement of solar panels and conduits.

The SPVS would generate 10 to 15 megawatts alternating current (AC), or up to 18 megawatts DC. NV Energy would construct either fixed or one-axis type solar panels. Fixed panels do not track the sun and are fixed in an optimal position to collect solar radiation. Fixed panels would be constructed in east to west oriented rows to take advantage of solar azimuth angles. One-axis panels are also constructed in rows, but include a drive shaft and motor that rotates the panels to follow the maximum solar irradiance. Electric drive motors mounted on concrete foundations would be used to rotate the panels, and no hydraulic systems would be incorporated into the design.

The highest point of the solar array would be no higher than 15 feet above the ground surface based on panel type (i.e. fixed or tracking), ballasting requirements and tilt of the panels. The solar panels would be ballasted to minimize excavation. Conduits between the solar panels and the feeder line would be trenched in the landfill cap, but at a depth that would not penetrate the cap. During cooler months the SPVS may generate power beyond the immediate needs of Nellis. NV Energy would potentially include energy storage (i.e. batteries) in the project design. Nellis would be the primary recipient of power generated by the SPVS, but some excess power will go to the electric grid when energy demand at Nellis is lower than the plant output. NV Energy would be the recipient of renewable energy credits as a result of the project.

To transmit power from the SPVS to Nellis, a feeder line would be constructed from the SPVS and integrated with the existing Nellis distribution system (see Figure 1-2). The feeder line would consist of a parallel run of 1,000 mcm (thousand circular mils size) cable buried in two 6-inch diameter underground conduits. The feeder line would be buried at a depth of 46 inches either completely within the USAF property boundaries at Nellis or along the western perimeter fence of Nellis. The new feeder line would tie into a 3-way switch placed on an existing riser pole located 400 feet from the Nellis Northgate Substation. Approximately 400 feet of existing buried cable between the riser pole and the Substation would be upgraded to match the new feeder installation.

Prior to construction, the SPVS site would be isolated from the rest of Nellis through the installation of a separate fence. At the start of construction, access to the site would occur from E. Carey Avenue, without the need to transport construction materials and labor forces through Nellis. Security would be established at the construction entrance on E. Carey Avenue. Following commercial operation of the SPVS, maintenance access would occur from interior roads within Nellis. Solar panel construction would occur both off-site and on-site. Materials would be transported to the project area by truck where they would be staged, assembled and moved into place. Construction duration (from initial site grading and staging of equipment and panels to completed solar array) would be approximately 6 to 8 months. Nellis security fencing would remain in place during the life of the project, and all ingress and egress for construction and maintenance would meet Nellis security requirements.

Decommissioning would occur following the end of the outgrant, or the outgrant would be renewed if deemed economically feasible to both the USAF and NV Energy. Should decommissioning occur, all solar panels would be removed, and concrete footings and ballasts would be disposed of in accordance with state and Federal regulations. The buried conduit and feeder lines would be removed and all attachment points for electrical cables would be removed and cut flush with the soil surface.

2.1.1 Public Involvement in Proposed Action Development

A public scoping meeting was held at Martin Luther King Jr. Elementary School on 15 June 2010. The public was provided information about the Proposed Action and asked to provide input on alternatives to the Proposed Action as well as provide information concerning sensitive resources in the area. The USAF provided the public the ability to submit oral and written comments during and after the meeting. Comments generated from the public during the 15 June 2010 Scoping Meeting are provided in Appendix B.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

2.2.1 Introduction

Alternatives to the Proposed Action for the SPVS were evaluated, and reasonable alternatives have been carried forward for evaluation. Nellis evaluated other sources of renewable energy as an alternative to the proposed SPVS. However, Nellis determined that no other sources of renewable energy are reasonable alternatives to solar power at Nellis. To date, wind turbines are being debated as to their interference with flight operations and military radar systems, and some wind energy project applications on public lands have been placed on hold or withdrawn because of these concerns (Wind Energy Update 2010; Riverside Press-Enterprise 2010). Geothermal as a renewable energy source does not exist due to geologic constraints at Nellis. Further, the Las Vegas Valley is in the Mojave Desert which experiences in excess of 300 days of sunshine annually and little cloud cover to reduce solar radiation, thus making energy from the sun the reasonable choice.

Although alternative sources of renewable energy are not available, alternative locations for the SPVS and alternative methods for constructing interconnecting conduits were considered. These alternatives and the No Action Alternative are described below.

2.2.2 Alternative Location for SPVS

Although locating the SPVS off-site was considered, the logical decision is that the SPVS be located on Nellis to provide cost effective renewable energy to Nellis. Any off-site locations would require land acquisition costs and additional feeder line runs to accommodate power

transfer from the SPVS to Nellis. This reduces the cost effectiveness of the proposed project, making off-site locations for the SPVS not feasible.

Several alternative locations on Nellis were evaluated, but none have been determined to be reasonable due to their proximity to flight operations, or inadequate available area (i.e. too small of a site) to support the SPVS. After an evaluation of various sites, a site at the Nellis Small Arms Range was initially thought by Nellis to have the potential to support the SPVS (Figure 2-1). Because the Nellis Small Arms Range lacks appropriate infrastructure, the costs to Nellis and NV Energy would be substantially higher than the Proposed Action.

Beyond costs, other constraints to development at this site were also recognized. The feeder line integration to an existing Nellis substation would traverse private property, highway rights-of-way and an active railroad. The Nellis Small Arms Range site is located near an active target range, increasing the risk of damage to solar panels from weapons training. The alternative site provides suitable habitat for the desert tortoise (*Gopherus agassizii*), and has unexploded ordnance that would require identification and removal before solar panel installation. Because of these issues, Nellis determined that the Nellis Small Arms Range site would not be a viable alternative, and as a result, the site was dismissed from further consideration. A more detailed analysis for this alternative was not conducted due to it being dismissed from consideration as discussed above.

2.2.3 Modified Conduit Connection Alternative (Alternative Carried Forward)

As an alternative to trenching within the landfill cap to position interconnecting conduit between solar panels and the feeder line all interconnecting conduit would be located above-ground. This alternative would place the entire conduit above-ground between solar panels. The only trenching required would be to construct the feeder line outside the western perimeter fence of Nellis. This has been determined to be a viable alternative and is carried forward for further analysis.

2.2.4 No Action Alternative

As required by NEPA and the EIAP, an alternative to the proposed action for the USAF would be the No Action Alternative. The USAF would not outgrant the 160 acres to NV Energy for construction and operation of a SPVS. However, the USAF at Nellis would continue to seek alternative methods to meet the DoD and USAF requirements for increased use of renewable energy.

2.3 FEDERAL, STATE, AND LOCAL PERMITS

The Proposed Action would require NV Energy to acquire permits from various regulatory agencies. Since the Proposed Action would disturb an area greater than 1 acre, a National Pollutant Discharge Elimination System (NPDES) Storm Water Construction permit will be required prior to construction. This permit would require that a Storm Water Pollution Prevention Plan (SWPPP) and Notice of Intent to Construct be prepared and filed with the Nevada Department of Environmental Protection (NDEP). Since Sloan Channel is deemed a jurisdictional waters of the U.S., Clean Water Act Section 404 and 401 permits would be required for the temporary construction crossing. It is likely that a Nationwide General Permit 14 for Linear Transportation Crossings would be utilized for this Proposed Action. A Clark County Surface Disturbance Permit (i.e. dust permit) would be required during construction. These permits would be secured by NV Energy, and would be coordinated through the Nellis, Civil Engineering, Environmental Flight, Compliance Section. No permits would be acquired by the USAF.

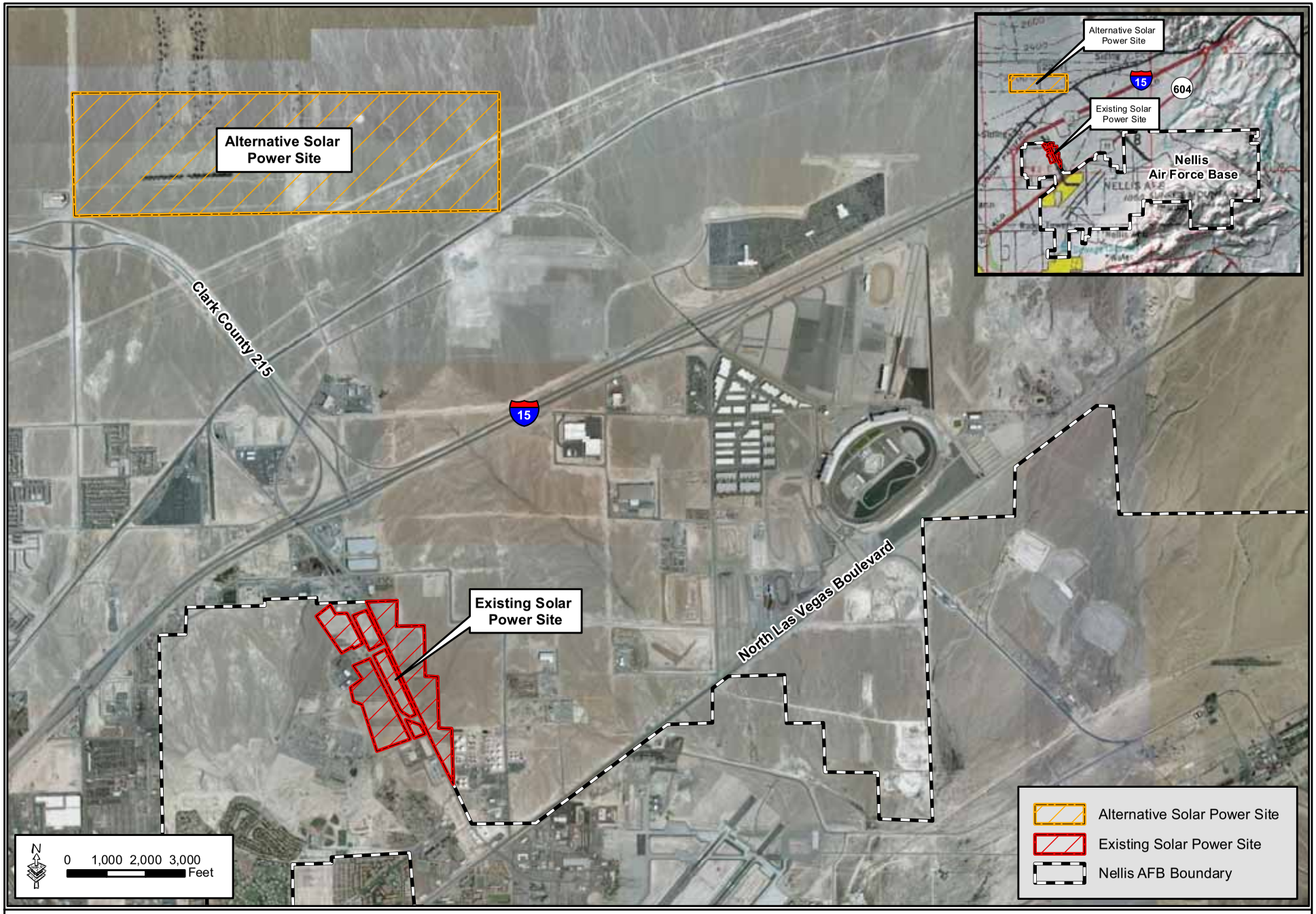

Figure 2-1: Alternative Small Arms Range Site

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 2-1 presents a summary of the impacts anticipated under the Proposed Action, Modified Conduit Connection and No Action Alternatives.

Table 2-1. Summary of Environmental Impacts

Effected Resource	Proposed Action	Modified Conduit Connection Alternative	No Action
Land Use	Land use change within Nellis would occur, but the land would remain as a military reservation. A reduction in visual resources would occur at the proposed project area from the solar panels. Reflectivity studies indicate that solar panel reflectivity is no greater than weathered concrete; therefore, no impacts would occur from sunlight reflection.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Soils	Up to 160 acres of non-native or previously disturbed soils would be modified, but erosion control measures would reduce the impacts on soils.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Air Quality	Short-term and minor impacts on air quality would occur during construction: Dust suppression and vehicle maintenance would minimize impacts.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Noise	Noise would be generated during the construction of the SPVS, and noise contours greater than 65 dBA and less than 75 dBA would temporarily extend into adjacent residences and a public park. Deliveries of materials could occur at any time during the construction period, but construction activities would occur during daylight hours to minimize impacts to day/night noise levels	Impacts would be the same as the Proposed Action.	No impacts would occur.
Water Resources	Minor short-term impacts on Sloan Channel would occur during the placement of a temporary crossing. Appropriate Clean Water Act permits and associated mitigation measures would minimize impacts on waters of the U.S.	Impacts would be the same as the Proposed Action.	No impacts would occur.

Table 2-1, continued

Effected Resource	Proposed Action	Modified Conduit Connection Alternative	No Action
Biological Resources	No native biological resources or habitats exist in the project area; therefore, there would be no significant impacts on vegetation. Impacts on wildlife populations would be minimal. The loss of active ground squirrel burrows and man-made burrows would occur; however, mitigation measures to allow for passive owl relocation to man-made burrows would reduce the impacts on this species. To avoid impacts on ground-nesting birds, surveys for active nests or nesting activity would be conducted prior to construction should clearing and grubbing occur during the nesting season.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Socioeconomics, Environmental Justice and Protection of Children	Socioeconomic and Environmental Justice issues would be less than significant because benefits such as more available energy, reduced energy costs to Nellis and improved air quality associated with increased use of renewable energy would accrue to all citizens in the area affected.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Hazardous Material	No hazardous materials are known to be located on the project site. The closed and capped landfill would not be penetrated by construction activities and the depth of the landfill cap would be increased. Hazardous materials management and Spill Control and Countermeasures Plan would be implemented during construction and use.	Impacts would be the same as the Proposed Action.	No impacts would occur.
Safety	Safety response for the property would remain with Nellis and the security fence would remain in place, so no significant safety impacts would occur.	Impacts would be the same as the Proposed Action.	No impacts would occur.

SECTION 3.0
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing environmental conditions at and surrounding the proposed 160-acre site on Area I at Nellis. It provides a baseline from which to identify and evaluate environmental changes resulting from the proposed outgrant of USAF (Nellis) lands, and the construction and operation of the SPVS.

Only those resources that have a potential to be affected are discussed, as per CEQ guidance (40 CFR 1501.7[3]). Therefore, the following resources will not be discussed for the following reasons:

- **Climate** - The project would not affect, or be affected by, climate.
- **Farmlands** - No farmlands exist on or near the project site.
- **Wilderness** - The project site is not located in or near a wilderness area.
- **Wild and Scenic Rivers** - No wild and scenic rivers exist in proximity to the project site.
- **Fire Management** - The project site is not located in a fire risk area, and local building codes would regulate fire control following construction.
- **Floodplain** - The project site is not located within a floodplain, and would not affect other floodplain designations.
- **Cultural Resources** - No cultural resources were located on the proposed project site and State Historic Preservation Officer concurrence was received (Nellis 2006).

3.2 LAND USE

Approximately 160 acres of land, all of which is owned and managed by USAF, located on Nellis, would be used to construct and operate the SPVS. The proposed project site is currently developed, functioning as a closed landfill (Nellis landfill, Environmental Restoration Program [ERP] Site LF-01) on the east side of Sloan Channel and as abandoned closed portions of an existing golf course on the west side of Sloan Channel. The closed Nellis golf course is no longer irrigated and dead and dying landscape trees and turf grass are present throughout. The closed Nellis landfill is a highly disturbed unnatural landscape (Photograph 3-1). The landfill is capped and mostly denuded, and the portion of the golf course is covered with dead turf grass and open holes where irrigation components have been removed.

Photograph 3-1. View of the landfill and closed portions of the Nellis golf course looking southwest towards downtown Las Vegas.

The lands surrounding the proposed project site and underground feeder line are all developed areas, including industrial, commercial and residential uses (see Figure 1-2). The areas adjacent to the project site to the west are occupied by industrial businesses, including a wastewater treatment plant, and automobile and construction debris recyclers. To the south of

the project site, the adjacent areas are occupied by urban housing, small businesses, a park and school.

3.3 NOISE

Noise is generally described as unwanted sound, which can be based either on objective effects (i.e. hearing loss, damage to structures, *etc.*) or subjective judgments (e.g., community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB and the threshold of discomfort or pain is around 120 dB.

Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. "A-weighted" decibel (dBA) is a measure of noise at a given, maximum level or constant state level louder than the same level of intrusive noise during the day, at least in terms of its potential for causing community annoyance. It is generally agreed that people perceive "A-weighted" intrusive noise at night as being 10 dBA louder than the same level of intrusive noise during the day. This perception is largely because background environmental sound levels at night in most areas are also approximately 10 dBA lower than those during the day.

Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). A DNL of 65 dBA is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. Acceptable DNL noise levels have been established by the U.S. Department of Housing and Urban Development (HUD) for construction activities in residential areas (HUD 1984):

- **Acceptable** (not exceeding 65 dBA) – The noise exposure may be of some concern, but common building construction will make the indoor environment acceptable and the outdoor environment will be reasonably pleasant for recreation and play.

- **Normally Unacceptable** (above 65 but not greater than 75 dBA) – The noise exposure is significantly more severe. Barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable. Special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.

- **Unacceptable** (greater than 75 dBA) – The noise exposure at the site is so severe that the construction costs to make the indoor noise environment acceptable may be prohibitive and the outdoor environment would still be unacceptable.

As a general rule, noise generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces and 9 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, then the noise level would be 79 dBA at a distance of 100 feet from the noise source, 73 dBA at a distance of 200 feet, and so on. To estimate the attenuation of the noise over a given distance the following relationship is utilized:

Equation 1: $dBA_2 = dBA_1 - 20 \log (d_2/d_1)$

Where:

dBA_2 = dBA at distance 2 from source (predicted)
dBA_1 = dBA at distance 1 from source (measured)
d_2 = Distance to location 2 from the source
d_1 = Distance to location 1 from the source

Source: California Department of Transportation 1998

3.3.1 Existing Conditions

The project site is adjacent to unincorporated Clark County lands designated as Sunrise Manor; one neighborhood is located across Toiybe Street to the east and another neighborhood is located south of the project site along and across E. Carey Avenue (see Figure 1-2). The Martin Luther King Jr Park is adjacent to Nellis and near the proposed project site, and the Martin Luther King Jr. Elementary School is located across the park's southern boundary approximately 1,000 feet south of the project site. Sunrise Park is also proximate to the project site, located along E. Carey Avenue just south of Nellis. The neighborhoods adjacent to Nellis contain the nearest sensitive noise receptors, with one row of homes located north of E. Carey Avenue abutting USAF property and the proposed SPVS project site. Nellis and industrial properties are located to the north and west of the proposed project site and commonly generate high noise levels. The project site and the adjacent residential homes are located near the Nellis aircraft runways. The entire project site is located within the Nellis 65 dB DNL noise contour and part of the project site is in the 70 dB DNL noise contour. Figure 3-1 presents the current Nellis noise contours and the boundaries of the project site and adjacent residential neighborhoods.

3.4 GEOLOGY AND SOILS

Nellis is located within the Las Vegas Valley, which is a topographical depression trending across Clark County, Nevada and surrounded by mountain ranges. Tectonically, the Las Vegas Valley is underlain by a series of Miocene strike-slip faults and normal Quaternary faults capable of producing significant earthquakes. Much of the recent fault movement has been normal faulting associated with subsidence as a result of groundwater withdrawal (University of Nevada Las Vegas [UNLV] 2003). The geology of the proposed project site is associated with its location in the Las Vegas Valley. No known active faults are located in the proposed project area.

Soils have been mapped as Bracken, consisting of very gravelly and fine sandy loam around the perimeter of the property and wherever vegetation is absent (Nellis 2007b). Imported organic loam has been placed on the former golf course fairways, greens and tee boxes to support the previously irrigated turf grasses. An improved clay cap has been placed on the closed landfill. The proposed project site slopes slightly from north to south, and erosion potential is low.

The closed Nellis landfill, which comprises the majority of the Proposed Project Area, is labeled ERP Site LF-01 (Nellis 2007b). Sloan Channel, which bisects the proposed project site, forms a physical barrier to areas located south of the closed landfill and demarcates the southern and western boundary of ERP Site LF-01.

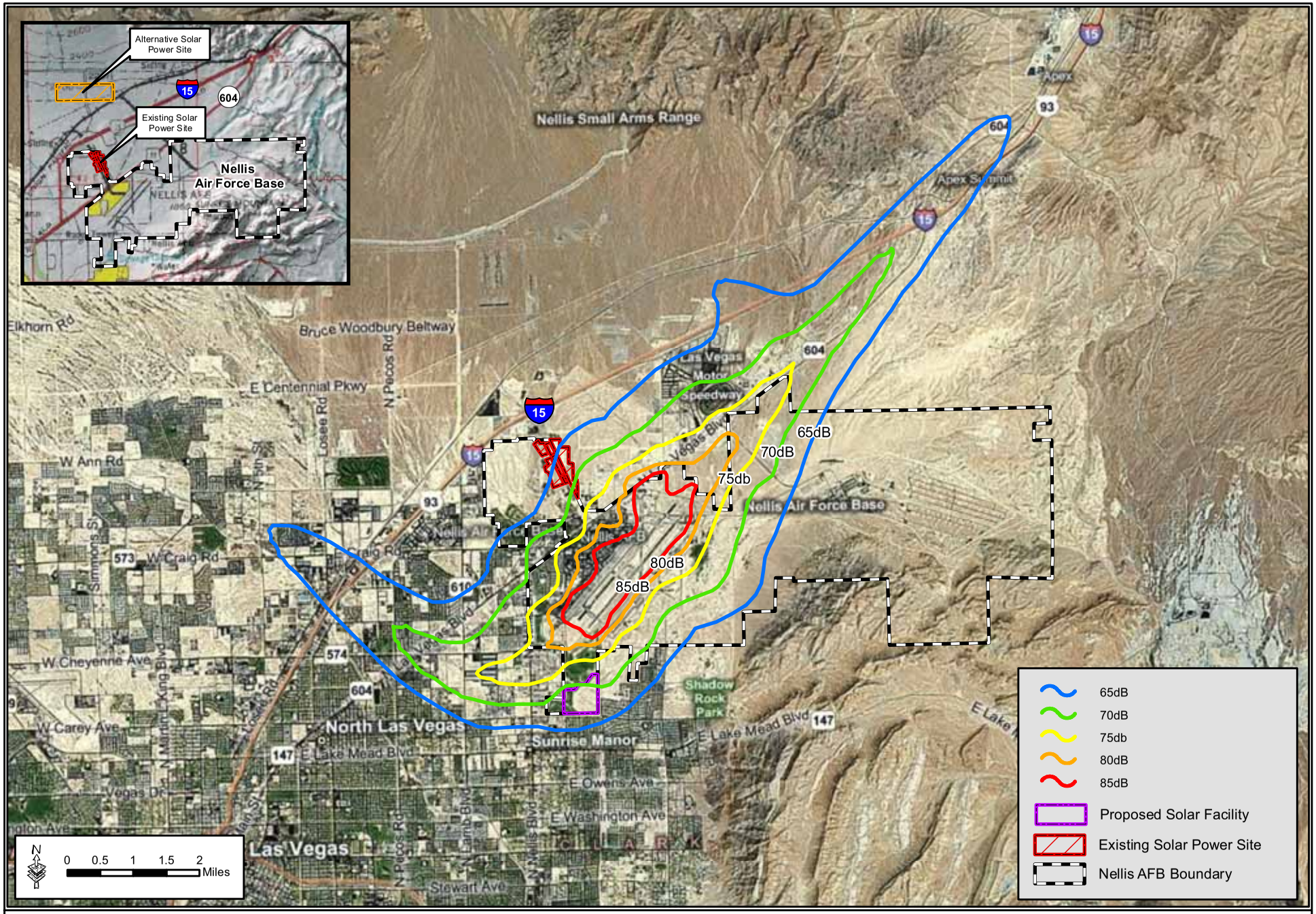

Figure 3-1: Nellis AFB Noise Contours

3.5 AIR QUALITY

The USEPA establishes National Ambient Air Quality Standards (NAAQS) for specific pollutants. The NAAQS standards are classified as either "primary" or "secondary" standards. The major pollutants of concern, or criteria pollutants, are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (PM-10), and lead (Pb). NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in Table 3-1.

Areas that do not meet these NAAQS standards are called non-attainment areas or maintenance areas; areas that meet both primary and secondary standards are known as attainment areas. The Federal Conformity Final Rule (40 CFR Parts 51 and 93) specifies criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Rule was first promulgated in 1993 by the USEPA, following the passage of Amendments to the Clean Air Act in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region designated as non-attainment or as a maintenance area for one or more NAAQS.

Table 3-1. National Ambient Air Quality Standards

POLLUTANT	STANDARD VALUE	STANDARD TYPE
Carbon Monoxide (CO)		
8-hour average	9ppm (10mg/m^3)	1˚
1-hour average	35ppm (40mg/m^3)	1˚
Nitrogen Dioxide (NO_2)		
Annual arithmetic mean	0.053ppm (100μ/m^3)	1˚ and 2˚
Ozone (O_3)		
8-hour average*	0.08ppm (157μg/m^3)	1˚ and 2˚
1-hour average*	0.12ppm (235μg/m^3)	1˚ and 2˚
Lead (Pb)		
Quarterly average	1.5μg/m^3	1˚ and 2˚
Particulate<10 micrometers (PM-10)		
Annual arithmetic mean	50μg/m^3	1˚ and 2˚
24-hour average	150μg/m^3	1˚ and 2˚
Particulate<2.5 micrometers (PM-2.5)		
Annual arithmetic mean	15μg/m^3	1˚ and 2˚
24-hour average	65μg/m^3	1˚ and 2˚
Sulfur Dioxide (SO_2)		
Annual average mean	0.03ppm (80μg/m^3)	1˚
24-hour average	0.14ppm (365μg/m^3)	1˚
3-hour average	0.50ppm (1300μg/m^3)	2˚

Legend: 1˚= Primary 2˚= Secondary ppm = parts per million
mg/m^3 = milligrams per cubic meter of air μg/m^3 = micrograms per cubic meter of air
* Parenthetical value is an approximate equivalent concentration

Source: USEPA 2010a

A conformity analysis determines whether a Federal action meets the requirements of the General Conformity Rule. It requires the responsible Federal agency to evaluate the nature of the Proposed Action and associated air pollutant emissions, calculate emissions as a result of the Proposed Action, and mitigate emissions if *de minimis* thresholds are exceeded. The

USEPA considers Clark County as a moderate non-attainment area for CO and O_3 and serious non-attainment for PM-10 (USEPA 2010b).

3.5.1 Greenhouse Gases and Climate Change

Global climate change refers to a change in the average weather on the earth. Greenhouse Gases (GHGs) are gases that trap heat in the atmosphere. They include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases including chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HFC), and halons, as well as ground-level O_3 (California Energy Commission 2007).

The major GHG-producing sectors in society include transportation, utilities (e.g., coal and gas power plants), industry/manufacturing, agriculture, and residential. End-use sector sources of GHG emissions include transportation (40.7 percent), electricity generation (22.2 percent), industry (20.5 percent), agriculture and forestry (8.3 percent), and other (8.3 percent) (California Energy Commission 2007). The main sources of increased concentrations of GHG due to human activity include the combustion of fossil fuels and deforestation (CO_2), livestock and rice farming, land use and wetland depletions, landfill emissions (CH_4), refrigeration system and fire suppression system use and manufacturing (i.e. CFC), and agricultural activities, including the use of fertilizers.

3.5.2 Greenhouse Gases Regulatory Framework

The regulatory framework for GHG has changed rapidly over the past few years. The USEPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires large sources that emit 25,000 metric tons or more per year of GHG emissions to report GHG emissions in the U.S., collect accurate and timely emissions data to inform future policy decisions, and submit annual GHG reports to the USEPA.

On 7 December 2009, the USEPA Administrator signed two findings regarding GHGs under Section 202(a) of the CAA:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings individually do not impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the USEPA's proposed GHG standards for light-duty vehicles, which were jointly proposed by the USEPA and the Department of Transportation's National Highway Safety Administration (NHTSA) on 15 September 2009.

EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed on 5 October 2009, directs Federal agencies to reduce GHG emissions and address climate change in NEPA analysis. It expands upon the energy reduction and environmental performance requirements of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. The new EO establishes GHG emission reductions as an overarching, integrating performance metric for all Federal agencies and requires a deliberative planning process.

CEQ provided draft guidance for determining meaningful GHG decision making analysis. CEQ GHG guidance is currently undergoing public comment at this time; however, the draft guidance states that if the proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of equivalents of CO_2 GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO_2 equivalents, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs (CEQ 2010).

3.6 WATER RESOURCES

Water resources encompass the surface and groundwater features at the Proposed Project Area. Factors that make water resources essential in southern Nevada, and at Nellis, include rapid population growth, the arid climate of the area, limited water resources and increased protection against drought.

The Las Vegas Valley has an evaporation rate of approximately 72 inches per year, compared to an annual precipitation rate of only 4 inches per year (Western Regional Climate Center 2010). In regard to resources, the Las Vegas Valley is limited legally in the amount of water that can be diverted from the Colorado River, and hydrologically in what can be pumped from the groundwater system. Based on the 1922 Colorado River Compact, and a 1964 Supreme Court Decree in Arizona vs. California, Nevada has a "consumptive use" of 300,000 acre-feet per year from the Colorado River. The principal groundwater aquifer in the Las Vegas Valley has been estimated to have a sustainable yield of approximately 40,000 acre-feet per year, and accounts for up to 39 percent of water use in the valley, with the remainder coming from Lake Mead (Las Vegas Valley Water District 2008).

3.6.1 Surface Water

Surface water on the Proposed Project Area consists of irrigation runoff from the nearby golf course and Sloan Channel (Photograph 3-2), a storm water runoff channel for Nellis. Sloan Channel is lined with concrete along portions of its length to prevent erosion of the banks. Sloan channel is considered a jurisdictional waters of the U.S., since flow in the channel would enter the natural stream system, and eventually the Colorado River.

Photograph 3-2. Sloan Channel which bisects the proposed project site.

3.6.2 Hydrogeology/Groundwater

The proposed project site and Nellis are situated on the eastern side of the Las Vegas Valley. Although this is a structurally formed basin, the Las Vegas Valley is filled with a considerable volume of alluvial sediments. This sediment volume and thickness has allowed a substantial groundwater reservoir (aquifer) to accumulate, which has historically provided a significant portion of the water supply for the City of Las Vegas and the surrounding communities. Groundwater currently accounts for about 29 percent of the water supply for Nellis (Nellis 2007a).

The primary water supply aquifers are situated at depths of at least 100 feet below ground surface (bgs) and in some areas more than 200 feet bgs. The gradient of the upper surface of the primary aquifer (the water table) generally slopes downward toward the east; the groundwater flow within Las Vegas Valley is generally from west to east. The nature of the current climate (arid) and the composition of the underlying sediments (from carbonate rock sources) combine to promote the formation of a shallow hardpan layer within depths of up to 20 feet bgs. This commonly results in the establishment of perched aquifers, especially where artificial sources of water are allowed to seep into the ground (Nellis 2007a).

The project site is located on a capped Nellis landfill, which has been closed with no further restoration action planned. As part of the closure actions for the landfill, groundwater monitoring wells were installed within the proposed project area. Water table levels in these wells indicated a depth to shallow groundwater of 50 feet bgs in the shallow aquifer. Recent analysis of groundwater collected from the monitoring wells confirmed that groundwater in the shallow aquifer under the proposed project area is not contaminated by leachate from the landfill (Nellis 2007b).

3.7 BIOLOGICAL RESOURCES

3.7.1 Vegetation

Vegetation within the proposed project area is limited to dead turf grass and dead and dying ornamental trees and shrubs associated with the closed golf course landscape. The capped landfill contains very little vegetation, and is dominated by non-native plant species such as Russian thistle (*Salsola paulsenii*) and cheatgrass (*Bromus tectorum*). No native vegetation communities remain on the site.

3.7.2 Wildlife

During a pedestrian survey of the proposed project area in June 2010, several bird species were observed, including mourning dove (*Zenaida macroura*), great-tailed grackle (*Quiscalus mexicanus*), killdeer (*Charadrius vociferous*), lesser nighthawk (*Chodeiles minor*) and western burrowing owl (*Athene cunicularia hypugaea*). No mammals or reptiles were observed during the survey. Several abandoned ground squirrel burrows and man-made holes occur throughout the project site; these burrows and holes provide suitable habitat for western burrowing owl. Due to significant human activity, adjacent urban residential and industrial development and lack of suitable habitat, it is unlikely that the proposed project area would support other wildlife populations.

3.7.3 Sensitive Species

The U.S. Fish and Wildlife Service's (USFWS) responsibilities under the Endangered Species Act (ESA) include: (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other Federal agencies concerning measures to avoid harm to listed species.

In addition, the USFWS has identified species that are candidates for listing as a result of identified threats to their continued existence. The candidate designation includes those species for which the USFWS has sufficient information on hand to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Candidate species and Species of Concern currently have no legal protection under the ESA. However, they may be protected under other Federal or state laws.

A total of 15 species Federally listed as Threatened or Endangered, or as Candidates for Listing are known to occur in Clark County, but none of these species are supported by habitats found within the project area. Of these listed species, 11 are associated with aquatic habitats that are not present on, or proximate to the proposed project area, including nine species of fish, the Yuma clapper rail (*Rallus longirostris yumanensis*), and the relic leopard frog (*Rana onca*). Additionally, the southwestern willow flycatcher (*Empidonax traillii extimus*) and yellow-billed cuckoo (*Coccyzus americanus*) are associated with riparian habitats, which are absent on the proposed project site. The desert tortoise is known to occur within the Mojave Desert and suitable habitat is present on parts of Area II of Nellis. The proposed project site is located within this desert, but does not contain suitable habitat or food resources for the tortoise. This species prefers flats and alluvial fans habitat and native grasses and cacti, none of which is found in the project area. One candidate species, the Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesi*), is known to occur on portions of Nellis, but does not occur on either the closed landfill or abandoned golf course greens that comprise the proposed project site. There is no critical habitat designated for threatened or endangered species located at or near the project site.

The Nevada Department of Conservation and Natural Resources (DCNR) maintains the Natural Heritage Program (Nevada Natural Heritage Program 2010). This program lists endangered, threatened, rare, and sensitive species in Nevada. This list includes flora and fauna whose occurrence in Nevada is or may be in jeopardy, or with known or perceived threats or population declines. Approximately 70 plant, 25 invertebrate, four fish, one amphibian, one reptile, 15 mammal, and six bird species are considered at-risk in Clark County. An additional 27 plant, two invertebrate, and 31 vertebrate species are on the watch-list for Clark County. Many of these species are protected by Nevada State laws; Nevada Administrative Code [NAC] 503 outlines wildlife species that are protected, and Nevada Revised Statutes [NRS] 527 summarizes the native flora protected by Nevada State Law.

Suitable habitat is present on the site for the western burrowing owl and a number of the state at-risk and watch-list plant and animal species. During the site survey on June 2010, one protected species, the western burrowing owl, was observed at an artificial burrow along the banks of Sloan Channel within the proposed project site (Photograph 3-3), and is known to utilize burrows on the capped landfill. No other at-risk or watch-list species were observed during the survey.

Photograph 3-3. Burrowing owl at an artificial burrow on the bank of Sloan Channel.

The western burrowing owl is a Nevada state protected species and listed a Sensitive Species by the Bureau of Land Management. Burrowing owls are also protected under the Migratory Bird Treaty Act of 1918, which makes it unlawful to kill or injure migratory birds, eggs, or occupied nests during the breeding season.

Habitat loss has occurred at a rapid rate in the Las Vegas Valley as the Las Vegas metropolitan area expanded in the recent past. Development in the Las Vegas Valley occurs in a pattern that leaves many undeveloped smaller parcels within the urban area. At Nellis, western burrowing owls are known to utilize abandoned ground squirrel burrows and man-made holes throughout the landfill and golf course on the project site. Artificial burrows are located along the top of the Sloan Channel banks. These man-made burrows were constructed as a result of passive

relocation efforts conducted as mitigation for channel improvements that destroyed active burrows (Nellis 2007a).

3.8 INFRASTRUCTURE

The focus of this section is on infrastructure components that could be temporarily or permanently impacted by the Proposed Action Alternative. Of the infrastructure associated with Nellis and the region (i.e. potable water, wastewater treatment, utilities and transportation), only utilities and transportation would potentially be affected by the Proposed Action.

3.8.1 Utilities

A detailed description of utilities was provided in the *Final Nellis and Creech Air Force Bases Capital Improvements Program Environmental Assessment* (Capital Improvements Program EA; USAF 2008b) and is incorporated herein by reference. NV Energy provides the majority of electric power to the base. A small percentage of electrical power generated by the Hoover Dam is provided to Nellis by Western Area Power Administration; and as previously described, power is also provided from the SPVS in Area III.

The Southwest Gas Company provides natural gas to Nellis. The Southwest Gas Company supply line distributes gas to Nellis through 206,000 linear feet (almost 40 miles) of polyethylene pipelines. Nellis maintains three 1,000-cubic-foot cylinder tanks of natural-gas storage to refuel government vehicles.

3.8.2 Transportation

A detailed description of transportation at Nellis was provided in the Capital Improvements Program EA (USAF 2008b) and is incorporated herein by reference. Nellis is near several major highways (Figure 3-2). Regional access to the base is provided by Interstate 15 (I-15) via exits at Craig Road from the west, Las Vegas Boulevard from the north, and Nellis Boulevard to the south. From Nellis, I-15 may be reached via Craig Road or Las Vegas Boulevard; the Craig Road intersection with I-15 is the interchange closest to the base, located approximately 2.5 miles west of the main gate. Cheyenne Avenue intersects I-15 approximately 4 miles west of the base and ends at Nellis' southwest boundary, near the base golf course.

The roads within Nellis form a network independent from the surrounding vicinity. A 2006 traffic study (USAF 2006) investigated the general traffic flow throughout Nellis and looked specifically at 16 intersections and 10 areas of the base that have potential traffic congestion or safety issues. Traffic counts were taken at these intersections at peak periods to establish base traffic demand. Data were used to evaluate and quantify existing traffic problems. The study indicated numerous intersections of particular concern to warrant either a signal light, roundabout, or realignment: the intersections of Beale and Ellsworth Avenues; four intersections along Washington Boulevard; Ellsworth Avenue and Fitzgerald Boulevard; Tyndall Avenue, March Boulevard, and Delvin Drive; Duffer Drive and Rickenbacker Road; Tyndall Avenue and Kinley Avenue; and Hollywood Road. The study also revealed traffic delays at the Main Gate at the intersections of Fitzgerald Boulevard, Las Vegas Boulevard, and Craig Road and at the Tyndall Gate at the intersection of Tyndall Avenue, Nellis Boulevard, and Gowan Road. This study concluded that adverse transportation conditions exist at the Tyndall Gate and recommended retiming of the existing signal light. The remainder of the traffic issues can be resolved by better usage of lanes, signs, and crosswalks, according to the study.

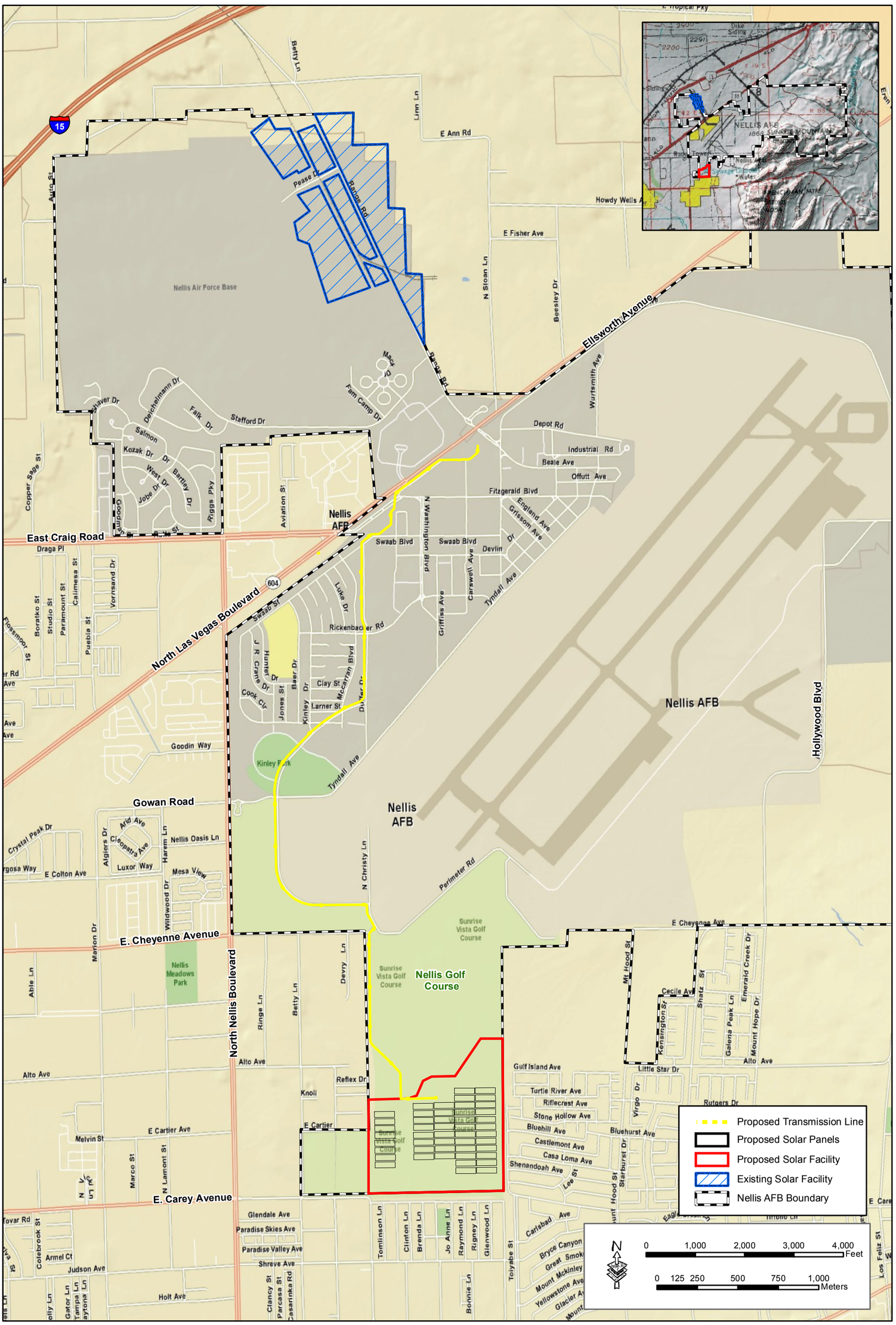

Figure 3-2: Transportation Map

3.9 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

3.9.1 Socioeconomics

The proposed project site is located in the Sunrise Manor Census Designated Place (CDP) as designated by the U.S. Census Bureau (USCB). Communities such as the City of Las Vegas and the Sunrise Manor CDP in Clark County have experienced rapid growth in population over the last decade as a result of people moving out of the larger cities and into the suburbs. In 2008 (the most recent data available for the Sunrise Manor CDP), 2,600,187 people lived in the state of Nevada and 1,865,746 people lived in Clark County (USCB 2008). The total 2008 population of Sunrise Manor CDP was 191,195 (USCB 2008).

The per capita income (PCI) of Sunrise Manor CDP residents was less than the PCI of Clark County, the City of Las Vegas or the State of Nevada. The 2008 PCI of Clark County was $27,383, $27,421 for the State of Nevada, and $19,267 for Sunrise Manor CDP (USCB 2008).

The median household income for Sunrise Manor CDP was lower than the 2006 median household income of Clark County, the City of Las Vegas, Nevada and the Nation. The median household income in 2006 for Clark County was $56,696 (USCB 2008). This is higher than the 2006 median household income for the state ($56,361) and the median household income for the Nation ($52,029) (USCB 2008). The median household income for Sunrise Manor CDP in 2008 was $48,930 (USCB 2008).

3.9.2 Environmental Justice

EO 12898, Environmental Justice, was issued by the President on 11 February 1994. Objectives of the EO, as it pertains to this EA, include development of Federal agency implementation strategies and the identification of low-income and minority populations potentially affected because of proposed Federal actions. Accompanying EO 12898 was a Presidential Transmittal Memorandum referencing existing Federal statutes and regulations to be used in conjunction with EO 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA when such analysis is required by the NEPA 42 U.S.C. Section 4321 *et. seq*. Specifically, the memorandum indicates that:

> *"each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of federal actions, including effects on minority communities and low-income communities,"*

Although an environmental justice analysis is not mandated by NEPA, DoD has directed that NEPA will be used as the primary mechanism to implement the provision of the EO.

Low-income populations exist in Clark County, the City of Las Vegas, and Sunrise Manor CDP. In Clark County, approximately 8 percent of families and 11 percent of individuals were living below the 2008 poverty level (USCB 2008). Approximately 10 percent of families and 15 percent of individuals in Sunrise Manor CDP were living below the poverty level in 2008 (USCB 2008). The percentage of families and individuals living in poverty in Sunrise Manor CDP in 2008 was higher than both Clark County and the City of Las Vegas.

The proposed project site is located adjacent to residential areas populated with low income and minority residents (i.e. residential neighborhoods in Sunrise Manor CDP). The regions of Clark County, the City of Las Vegas and Sunrise Manor CDP have a culturally diverse population. Clark County has 28 percent of the population that claim Hispanic or Latino origin, respectively

(USCB 2008). Sunrise Manor CDP has 45 percent of the population that claim Hispanic or Latino origin (USCB 2008). The 2008 Census also indicates that 9 percent and 8 percent of the population of Clark County and Sunrise Manor CDP, respectively, are African American (USCB 2008).

3.9.3 Protection of Children

EO 13045, Protection of Children, requires each Federal agency to:

> "*identify and assess environmental health risks and safety risks that may disproportionately affect children";* and *"ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks*."

This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. In Clark County 26 percent of the population is under 18 years of age and 8 percent of the population is under 5 years of age (USCB 2008). In Sunrise Manor CDP, 30 percent of the population is under 18 years of age and 10 percent of the population is under 5 years of age (USCB 2008). The potential for impacts on the health and safety of children would be greater where projects are located near residential areas or schools.

Two public parks are located to the south of the proposed project area, across E. Carey Avenue. Because of available playground and recreational equipment located at the park, children would likely be present at the park during daytime hours. Martin Luther King Jr. Elementary School is located approximately 750 feet south of the proposed project area.

3.10 HAZARDOUS AND TOXIC SUBSTANCES

The project site was previously assessed for the presence of hazardous and toxic substances according to American Society for Testing and Materials (ASTM) standards for Phase I Environmental Site Assessments (ASTM E1527-05). Although the Proposed Action site is partially on a closed and capped landfill, the property was determined to contain no risk due to the presence of hazardous or toxic materials (Nellis 2010).

3.11 SAFETY

Safety and emergency response for the proposed project area are currently the responsibility of Nellis. The former golf course and closed landfill, as part of Nellis, are completely fenced to prevent unauthorized entry of non-military personnel. There are currently no safety-related issues associated with the use of the site as a closed landfill.

SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This section of the EA addresses potential impacts on environmental resources within or near the proposed project site. An impact (consequence or effect) is defined as a modification of the human or natural environment that would result from the implementation of an action. The impacts can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action. Direct impacts are those effects that are caused by the action and occur at the same time and place (40 CFR 1508.8[a]). Indirect impacts are those effects that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8[b]). The effects can be temporary, short in duration (short-term), long lasting (long-term), or permanent. For purposes of this EA, temporary effects are defined as those that would last for the duration of the construction period; short-term impacts would last from the completion of construction to 3 years. Long-term impacts are defined as those impacts that would occur from 3 to 10 years after construction, while permanent impacts indicate an irretrievable loss or alteration.

Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. Significant impacts are those effects that would result in substantial changes to the environment (40 CFR 1508.27), and should receive the greatest attention in the decision-making process. Insignificant impacts are those that would result in minimal changes to the environment. The significance of the impacts presented in this EA is based upon existing regulatory standards, scientific and environmental knowledge and best professional opinions.

4.2 LAND USE

4.2.1 Proposed Action Alternative

Land use within the project site would change from previously developed and abandoned open space to a solar energy generating facility. The project site is currently part of a Federal military reservation, and would remain as such under the Proposed Action, although the an outgrant of the property to NV Energy would occur. The adjacent properties to the west are currently used for industrial purposes, and the operation of SPVS on the proposed project site would be similar to adjacent property uses. The proposed SPVS is passive and would not alter land use of the residential properties to the south and east. The proposed SPVS construction and operation would not interfere with Nellis land use to the north and the underground placement of the feeder line would occur along existing transportation and utility corridors, and would not alter or interfere with surrounding land uses. The proposed use of the property for a SPVS would be compatible with the Nellis plan to increase energy efficiency on base and provide for stable energy rates in the future. The proposed construction and operation of a SPVS would be compatible with Nellis' renewable energy progression.

The SPVS would contain solar panels and these panels would be located just south of active USAF runways. Nellis and NV Energy completed a study of solar refraction from flat plate photovoltaic modules (Black & Veatch 2010). The purpose of the study was to quantify glare from a flat plate SPVS. The study utilized a worst case scenario approach based upon information available at Nellis, including using recorded Nellis data for intensity; calculating glare experienced by pilots if reflected angle was directly into a pilot's eyes for every hour of the year; comparing the SPVS to known ocular safety metrics. Comparison of the proposed SPVS was made with known data points such as the reflectivity of other common surfaces pilots may see

upon approach, Federal Aviation Administration (FAA) regulations and published reports, and example flat plate panel SPVS installed at other airports.

The results of the study indicated that under the worst case scenario, there would be a slight potential for an after image or flash glare resulting from reflected direct sunlight. This after image or flash glare is similar to the potential for flash glare due to water and less than that due to weathered, white concrete and snow. Since this represented the worst case scenario, it would be expected that pilots would typically mitigate glare using glare shields and sunglasses; these typically reduce radiation by approximately 80 percent and would make any reflected sunlight from solar panels insignificant.

A review of FAA Regulations and completed studies determined that there are no regulations associated with reflected sunlight around airports. A study completed by the California Department of Transportation, Division of Aeronautics at the Southern California Logistics Airport in Victorville, found no objection to a proposed SPVS based on aircraft operational safety. Further, Denver International Airport; San Francisco International Airport; Fresno International Airport; San Jose International Airport, Buckley Air Force Base and Luke Air Force Base all have solar panels in proximity of active runways.

The proposed SPVS would not alter Nellis land uses and would be a passive system that would not impact land use on adjacent properties. Solar panels are designed to absorb solar radiation and, therefore, flat plate panels have little reflectivity. The Black & Veatch (2010) study found that flat plate panels reflect less sunlight than weathered, white concrete or snow. Because the land use change would be consistent with Nellis land use plans, and the operation of the SPVS would not cause a substantial increase in solar radiation reflectivity (compared to unvegetated desert soils and weathered white concrete currently present at the site), there would not be a significant impact on land use. Reflectivity of the metal stands and frames would be further subdued, if necessary, by painting the frames with a paint color with low reflective properties.

4.2.2 Modified Conduit Connection Alternative

The impacts on land use would be similar to the Proposed Action Alternative.

4.2.3 No Action Alternative

The proposed project site is currently open space comprised of a closed landfill and closed golf course greens, and under the No Action Alternative, the land use would not change.

4.3 NOISE

4.3.1 Proposed Action Alternative

The entire project site is located within the Nellis 65 dB DNL noise contour and part of the 70 dB DNL noise contour (see Figure 3-1). The noise emissions from aircraft sound differently than noise emissions produced by construction equipment. Aircraft noise is loud but intermittent, whereas, construction noise is typically quieter, but more constant. Sensitive noise receptors near the project site may experience irritation due to the construction noise despite the fact that they are presently exposed to louder intermittent noise emissions produced by aircraft operating out of Nellis.

Common construction equipment would be required to install the SPVS. Excavators, dump trucks, backhoes and front end loaders would be used to grade land and install solar panels. Noise emissions from common construction equipment were modeled and are described in Table 4-1.

Table 4-1. A-Weighted (dBA) Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances[1]

Noise Source	50 feet	100 feet	200 feet	500 feet	1,000 feet
Dump truck	76	70	64	56	50
Excavator	82	76	70	62	56
Front end loader	79	73	67	59	53
Concrete mixer truck	79	73	67	59	53
Pneumatic tools	81	75	69	61	55
Backhoe	78	72	66	58	52
Generator	81	75	69	61	55

Source: FHWA 2007and GSRC

1. The dBA at 50 feet is a measured noise emission (Federal Highway Administration [FHWA] 2007). The 100 to 1,000 foot results are GSRC modeled estimates.

Assuming a worst case noise emission scenario (i.e. an excavator with an 82 dBA sound level at a distance of 50 feet), the noise model projected that noise levels of 82 dBA from a point source would have to travel 110 feet before the noise would attenuate to a level of 75 dBA. However, at 360 feet from the point source, noise from the excavator would be attenuated to a normally acceptable level of 65 dBA.

The construction noise was modeled and the 65 dBA and 75 dBA noise contours were overlaid on a map of the proposed project area and adjacent neighborhoods. In addition to construction noise, residential homes may experience noise emissions from large trucks delivering solar panels to the project site during all hours of the day. Road access to the construction site is located along E. Carey Avenue adjacent to the project site. Large trucks, traveling at night and during early morning hours, may cause annoyance to residential receptors along these streets.

Residential homes that may be exposed to noise emissions greater than 75 dBA are located east and southeast of the project site. The 75 dBA noise level would be experienced by residential homes if excavation work (such as conduit trenching) occurs immediately adjacent to the project boundary. Noise exposure levels to residential homes would decrease as construction activity moves away from the southeastern project boundary. Table 4-2 summarizes the number of sensitive noise receptors that may be affected by noise emissions (worst case scenario) produced by project site excavation and solar panel installation activities.

Table 4-2. Sensitive Noise Receptors in Close Proximity of General Construction Activities

Noise Receptor	Number of Units	Distance from Construction Site	Noise Exposure
Residential Homes	188	Within 360 feet	Greater than 65 dBA and less than 75 dBA
Parks	1	Within 360 feet	Greater than 65 dBA and less than 75 dBA
Residential Homes	67	Within 110 feet	Greater than 75 dBA

Approximately 67 residential homes may be exposed to unacceptable noise emissions greater than 75 dBA when excavation activities are occurring near the southeastern edge of the project

site. An additional 188 residential homes may be exposed to normally unacceptable noise emissions greater than 65 dBA. However, construction activities would last for 6 to 8 months, after which, noise levels would return to ambient levels. Construction activity would be limited to daylight hours. Noise impacts would be minor and temporary with the implementation of these timing restrictions. Therefore, the noise impacts associated with the Proposed Action would be less than significant and would not impair the noise environment in the neighborhoods adjacent to the project site.

4.3.2 Modified Conduit Connection Alternative

The impacts of construction noise on residential homes and other sensitive receptors would be similar to the Proposed Action Alternative. However, less trenching would be required because all conduit would be located above-ground, reducing the noise emissions from trenching and excavation equipment relative to the Proposed Action Alternative.

4.3.3 No Action Alternative

Under the No Action Alternative, the noise receptors near the project site would not experience additional temporary noise impacts, because no new construction would take place.

4.4 GEOLOGY AND SOILS

4.4.1 Proposed Action Alternative

The construction of the SPVS would not disturb any geological resources, and no groundwater would be withdrawn during construction and operation of the SPVS that might contribute to subsidence, so there would be no impacts on the geology or from the seismicity of the area.

Short-term impacts on soils from the construction of the SPVS would occur; however, most soils on the project site are not native soils, but instead are soils imported to change the grade of the former golf course fairways and greens, and as a cap for the closed landfill. Additional soils would be placed on the landfill to level the surface and raise areas that have subsided. Construction methods for soil placement and grading, trenching of power lines and solar panel construction would employ best management practices (BMP) to reduce soil erosion, including silt fencing where appropriate, and wetting of disturbed soils to prevent dust.

The placement of solar panels on the site would increase the amount of impervious surfaces in the area, having long-term minor impacts on soils. Impervious surfaces reduce the amount of rainwater infiltration and percolation, and also increase the rate of flow of migrating rainwater which has the potential to disturb adjacent exposed soils. Construction and post-construction BMP, such as silt fencing and other storm water filtering devices installed as required by the Storm Water Pollution Prevention Plan (SWPPP) developed for the project, would reduce the migration of soils into the local stream network during rainfall events.

Minimal disturbance to the ERP Site, Landfill LF-01, would occur as a result of the Proposed Action. The existing landfill cap would not be excavated during construction and placement of solar panels. The cap depth would be increased by additional placement of fill to raise and level the elevation of the landfill surface and SPVS placed on top. Fill material would be trenched for conduit placement disturbing non-native soils. Nellis has requested NDEP concurrence with a determination of no impact on the ERP Site as a result of the Proposed Action.

Up to 160 acres of previously modified, non-native soils would be disturbed from the construction and operation of the SPV system (i.e. trenching). However, because the soils are previously disturbed and not natural to the site, adjacent natural soils are regionally and locally

common, and construction would employ methods to reduce soil erosion as practical, only minor impacts on soils are expected.

4.4.2 Modified Conduit Connection Alternative

Impacts on soils would be similar to those described for the Proposed Action, however, there would be less disturbance of non-native soils under this alternative. All interconnecting conduit would be above-ground between solar panels and trenching would only be required to construct the feeder line outside the western perimeter of Nellis. Additional soil would be needed to raise and level the closed landfill, and grading would be needed to level the former golf course, disturbing existing non-native soils. Development of a SWPPP would minimize any potential soil erosion during construction activities.

4.4.3 No Action Alternative

Under the No Action Alternative, there would not be an outgrant of the property and the SPVS would not be constructed; thus, the project site would not experience any geological or soil disturbance.

4.5 AIR QUALITY

4.5.1 Proposed Action Alternative

4.5.1.1 Construction Activities

Temporary and minor increases in air pollution and GHG would occur from the use of construction equipment (i.e. combustible emissions) and the disturbance of soils (i.e. fugitive dust) during site grading, placement of the solar panels and conduit. The following paragraphs describe the air calculation methodologies utilized to estimate air emissions produced by the Proposed Action. Fugitive dust emissions were calculated using the emission factor of 0.19 ton per acre per month (Midwest Research Institute 1996), which is a more current standard than the 1985 PM-10 emission factor of 1.2 tons per acre per month presented in AP- 42 Section 13 Miscellaneous Sources 13.2.3.3 (USEPA 2001).

USEPA's NONROAD Model (USEPA 2005a) was used, as recommended by USEPA's *Procedures Document for National Emission Inventory, Criteria Air Pollutants, 1985-1999* (USEPA 2001), to calculate emissions from construction equipment. Combustible emission calculations were made for standard construction equipment, such as front-end loaders, backhoes, bulldozers, and cement trucks. Assumptions were made regarding the total number of days each piece of equipment would be used, and the number of hours per day each type of equipment would be used (Appendix C).

Construction workers would temporarily increase the combustible emissions in the air shed during their commute to and from the project area. Emissions from delivery trucks contribute to the overall air emission budget. Emissions from delivery trucks and construction worker commute traveling to the job site were calculated using the USEPA MOBILE6.2 Model (USEPA 2005b, 2005c and 2005d).

The total air quality emissions were calculated for the Proposed Action to compare to the General Conformity Rule *de minimis* threshold of 70 tons per year of PM-10 and 100 tons per year for CO, VOCs and NO_2. The *de minimis* threshold (70 or 100 tons per year) is the point at which air emissions are significant. If air emissions exceed that threshold, they are considered a "major" impact. Summaries of the total emissions for the Proposed Action are presented in Table 4-3. Details of the analyses are presented in Appendix C.

Several sources of air pollutants contribute to the overall air impacts of the construction project. The air calculations in Appendix C and in the summary table included emissions from:

1. Combustible engines of construction equipment
2. Construction workers commute to and from work
3. Supply trucks delivering materials to construction site
4. Fugitive dust from job site ground disturbances
5. Bi-monthly commute for maintenance

Table 4-3. Total Air Emissions (tons/year) from Construction Activities vs. *de minimis* Levels

Pollutant	Total (tons/year)	*de minimis* Thresholds (tons/year)[1]
CO	24.54	100
VOC	4.84	100
NO_2	47.93	100
PM-10	49.53	70
PM-2.5	8.22	NA
SO_2	6.45	NA
GHG	19,891	25,000

Source: USEPA 2010b, 40 CFR 51.853, and GSRC modeled air emissions (Appendix C).
1. Clark County is in serious non-attainment for PM-10 and moderate non-attainment for CO and ozone.

As can be seen from Table 4-3, PM-10 air emissions from the Proposed Action do not exceed *de minimis* threshold and, thus, do not require a Conformity Determination. As there are no violations of air quality standards and no conflicts with the state implementation plans, impacts on air quality would not be considered major in the context of the General Conformity Rule.

During the construction of the proposed project, proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust. In particular, wetting solutions would be applied to construction area to minimize the emissions of fugitive dust. The construction plan must include a Clark County Dust Control Permit for Construction Activities. By using these BMPs, air emissions from constructing the Proposed Action would be temporary, and potential effects on air quality in Clark County would be minimal.

4.5.1.2 Operational Air Emissions

Operational air emissions refer to air emissions that may occur after the solar panels have been installed. That would include employee commuter vehicles traveling to the project site during the work week. In addition, air emissions were calculated for fugitive dust emissions when employees are driving around the project site to repair and maintain solar panels. Finally, air emissions were calculated for wind-blown dust throughout the year. The calculations for air emissions from these three operational sources are presented in Appendix C and are summarized in Table 4-4.

Table 4-4. Total Air Emissions (tons/year) from Site Maintenance and Wind Blown Dust vs. *de minimis* Levels

Pollutant	Total (tons/year)	*de minimis* Thresholds (tons/year)[1]
CO	0.89	100
VOC	0.09	100
NO_2	0.07	100
PM-10	55.10	70
PM-2.5	0.86	NA
SO_2	NA	NA
GHG	170.42	25,000

Source: USEPA 2010b, 40 CFR 51.853, and GSRC modeled air emissions (Appendix C).
1. Clark County is in serious non-attainment for PM-10 and moderate non-attainment for CO and ozone.

As can be seen in Table 4-4, PM-10 air emissions from the proposed operational activities do not exceed Federal *de minimis* thresholds. In addition, any onsite unpaved roads for solar panel maintenance access would be addressed to minimize fugitive dust emissions. As there are no violations of air quality standards and no conflicts with the state implementation plans, the impacts on air quality in Clark County would be less than significant from the implementation of the Proposed Action.

The Proposed Action provides long-term beneficial effects on local air quality and GHG emissions. The use of solar panels to generate electricity reduces dependence on fossil fuels that emit GHG. Providing solar energy to Nellis through would reduce energy-related emissions and has long-term benefits to air quality in Clark County.

4.5.2 Modified Conduit Connection Alternative

Construction and operational air emissions resulting from the implementation of the Modified Conduit Connection Alternative would be similar to those described in the Proposed Action, because trenching for conduit causes little PM-10 emissions relative to truck transport of soil and grading activities, and would be less than significant.

4.5.3 No Action Alternative

Under the No Action Alternative, there would be no outgrant of property on Nellis and the SPVS would not be constructed, and no additional air emissions would occur. Therefore, there would be no air quality impacts.

4.6 INFRASTRUCTURE

4.6.1 Proposed Action Alternative

4.6.1.1 Utilities

No adverse impact on utilities would occur as a result of the Proposed Action. In the long-term, there would be a beneficial impact on power generation and distribution as the proposed SPVS would reduce the Nellis energy dependence on the NV Energy distribution grid. Renewable energy supplied at a fixed rate would be beneficial for Nellis, and the additional energy supply that would otherwise be used at Nellis in lieu of the renewable energy would become available to residential and commercial customers.

4.6.1.2 Transportation

There would be short-term adverse impact on transportation during solar panel construction and placement activities. Additional construction traffic making deliveries of soil, concrete, conduit and solar panels would occur, and these deliveries would traverse E. Craig Road, N. Nellis Boulevard and E. Carey Avenue to reach the proposed project site. These deliveries would be limited to the life of the construction project. Some minor traffic delays would occur during construction, especially at the intersection of N. Nellis Boulevard and E. Carey Avenue. However, these delays would be minor and temporary, and there would be no long-term impacts on transportation as a result of the Proposed Action.

4.6.2 Modified Conduit Connection Alternative

The impacts on infrastructure would be the same as described for the Proposed Action Alternative.

4.6.3 No Action Alternative

There would be no adverse impacts on utilities or transportation because the SPVS would not be built at Nellis. Alternatively there would be no beneficial impacts on utilities due to the increased availability of a renewable energy supply at a fixed rate to Nellis.

4.7 WATER RESOURCES

4.7.1 Proposed Action Alternative

4.7.1.1 Surface Water

The Proposed Action would have minimal impacts on surface water quality. Temporary water quality impairments may occur if a major rain event occurred during the placement of additional fill and grading of soils prior to placement of the solar panels. Construction activities can disturb soils, which in turn, increase the probability of erosion.

NV Energy would be required to obtain a Storm Water Construction Permit with the NDEP prior to the implementation of the Proposed Action. A Storm Water Construction Permit for the Proposed Action is contingent on the development of a SWPPP, which would then be subject to approval by the NDEP. SWPPP requirements include an outline of the storm water drainage system for each discharge point, actual and potential pollutant contact, and surface water locations. The SWPPP would also incorporate storm water management controls, such as silt fencing and other storm water filtering devices. Compliance with the Storm Water Construction Permit and the SWPPP would minimize potential impacts on surface water quality.

USAF would require that NV Energy ensure avoidance of impacts on the project site from hazardous substances (i.e. anti-freeze, fuels, oils, lubricants) used during construction. Although catch pans would be used when refueling, accidental spills could occur as a result of maintenance procedures for construction equipment. A spill could result in adverse impacts to on-site soils and waters. However, the amount of fuel, lubricants, and oil is limited, and equipment necessary to quickly contain any spills would be present when refueling. USAF would require that NV Energy ensure that a Spill Prevention, Control and Countermeasures Plan (SPCCP) would be in place prior to the start of construction, and all personnel would be briefed on the implementation and responsibilities of this plan.

Construction equipment and operations may create operational pollution, such as oil leaks, mud spatters, and discards from human activities. USAF would require that an adequate number of latrines and covered trash cans are available at the job site, and that any leaks or spills from construction equipment are promptly cleaned. BMPs for construction site soil erosion, as

specified in the SWPPP and the Storm Water Construction Permit, would be implemented to prevent the migration of soils, oil and grease and construction debris into the local stream networks. No significant impacts on surface water during construction would be expected.

A Clean Water Act Section 404/401 permit would be required and consultation with the Clark County Flood Control District would occur for the temporary crossing structure (i.e. culverts and bridge) placed in Sloan Channel. The total area of disturbance for the crossing structure is estimated to be 1,000 square feet and would qualify for a Section 404, Nationwide General Permit 14 for Linear Transportation Crossings. The temporary crossing structure placement and removal would comply with the requirements of Nationwide Permit 14, and would not have any short-term or long-term impacts on surface water of Sloan Channel.

4.7.1.2 Groundwater

No long-term use of groundwater would occur for operation and maintenance of the SPVS; therefore, no long-term impact on groundwater quality or supply is expected. Water would be utilized during construction activities for dust suppression and soil compaction; the water drawn for these purposes would be from commercial water supplies and not have any impacts on groundwater. The landfill cap would not be functionally impacted and excavation for installation of conduit would occur within fill material placed on top of the landfill cap.

4.7.2 Modified Conduit Connection Alternative

The impacts on water resources would be similar to that described for the Proposed Action Alternative. However, reduced excavation for conduit placement would reduce the potential for erosion and subsequent impacts on water quality.

4.7.3 No Action Alternative

There would be no outgrant of USAF lands and no construction or operation of the SPVS under the No Action Alternative; therefore, there would be no adverse or beneficial impacts on water resources.

4.8 BIOLOGICAL RESOURCES

4.8.1 Vegetation

4.8.1.1 Proposed Action Alternative

With the implementation of the Proposed Action, very little vegetation would be disturbed. Of the 160 acre project area, all of the vegetation is either non-native or landscape vegetation that presently lacks irrigation. All of this non-native vegetation would be removed or buried during initial grading and soil placement activities. However, because there is little to no native vegetation at the proposed project site, there would be no impacts on native vegetation from the implementation of the SPVS.

4.8.1.2 Modified Conduit Connection Alternative

The impacts on vegetation would be the same as described for the Proposed Action Alternative

4.8.1.3 No Action Alternative

Under the No Action Alternative, no impacts on vegetation would occur because vegetation at the project site would not be disturbed by the construction and operation of the SPVS.

4.8.2 Wildlife

4.8.2.1 Proposed Action Alternative

With the implementation of the Proposed Action, impacts on wildlife populations would be minimal. Habitats on the proposed project site are not suitable for most wildlife and surrounding areas are part of a highly developed urban environment. Mobile species, such as birds and rabbits, would leave the site during construction and migrate to other more suitable locations nearby, such as the golf course. In order to avoid impacts on ground-nesting birds, such as burrowing owls and killdeer (*Charadrius vociferus*), a survey for active nests or nesting activity would be conducted prior to construction should clearing and grubbing occur during the nesting season (typically 15 March to 30 August). If the survey finds active nests, then construction personnel would either avoid nests until fledglings have left or permitted personnel would relocate eggs and chicks following all Federal and state regulations and permitting requirements. With the implementation of these measures, the construction activities would be in compliance with the Migratory Bird Treaty Act, and there would be no significant impacts on wildlife populations or their supporting habitat.

4.8.2.2 Modified Conduit Connection Alternative

The impacts on wildlife would be the same as described for the Proposed Action Alternative.

4.8.2.3 No Action Alternative

Under the No Action Alternative, no wildlife would be impacted, since the SPVS would not be constructed and the site would not be disturbed.

4.8.3 Sensitive Species

4.8.3.1 Proposed Action Site

Under the Proposed Action, no Federally listed species would be impacted because no species or suitable habitat were observed during biological field surveys, nor are they known to occur at the proposed project site. Burrowing owls utilizing burrows in the banks of Sloan Channel and man-made burrows located along the tops of the channel banks, would potentially be disturbed during construction activities. Solar panels would restrict the line-of-sight for burrowing owls, increasing the likelihood for predation by mammals such as coyotes (*Canis latrans*), or other raptors, such as red-tailed hawks (*Buteo jamaicensis*), and potentially causing owls to abandon both natural and man-made burrows along Sloan Channel. To reduce impacts on burrowing owls, owls would be passively relocated from any active burrows outside of the breeding season (September – February) and prior to the start of construction activities. Man-made burrows would be constructed where suitable foraging habitat is present, and far enough from the SPVS to allow owls to see potential predators. Approximately 2 to 3 weeks after new burrow construction, eviction of owls from active burrows would occur, allowing owls to familiarize themselves with new available burrow locations. One-way doors would then be placed over active burrows for 3 to 4 days, followed by removing all burrows in the SPVS construction area. These measures would ensure that there would be no significant impacts on burrowing owls from the Proposed Action.

4.8.3.2 Modified Conduit Connection Alternative

Impacts on special status species would be the same as described for the Proposed Action.

4.8.3.3 No Action Alternative

Under the No Action Alternative, no sensitive species would be impacted because the site would not be disturbed.

4.9 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

4.9.1 Proposed Action Alternative

4.9.1.1 Socioeconomics

The Proposed Action Alternative would benefit socioeconomic resources in Clark County in both the short-term and long-term. In the short term, during construction of the SPVS, there would be a temporary demand for construction employees from within the existing labor pool for a period of approximately 6 months. Furthermore, supplies and materials to construct the SPVS would be purchased from within the local economy to the greatest extent practicable. In the long term, the SPVS would provide energy to Nellis at a fixed rate, making energy otherwise used by Nellis for operations available to residential and commercial customers of NV Energy in Clark County.

4.9.1.2 Environmental Justice

The area around the proposed project site has been used for military and industrial purposes since 1941. The closed and capped landfill was in use from 1942 to 1985, during which time the nearby residential neighborhoods were developed (Nellis 2007b). The character of the area surrounding the proposed SPVS site has not changed substantially since that time, and there would be no changes to zoning or neighborhood character from placement of solar panels that would affect property values or socioeconomic environment in the area. The project is located in an area populated by minority and low income families, as reflected in the demographics for the entire Sunrise Manor CDP. There would be no loss of housing as a result of the Proposed Action Alternative, nor would local residents experience any long-term noise or risks to human health. There would be minimal disturbed changes to the aesthetic resources as a result of the placement of solar panels on 160 acres of open space; however, solar panel heights would not exceed 15 feet above the ground surface and there would be no increased reflectivity. The construction and operation of the SPVS would not disrupt the community structure or alter community cohesion because all of the activities would take place on existing USAF lands. Environmental justice impacts would not be significant because there would be no significant changes in land use or aesthetics, no disproportionate human health or environmental impacts on low income or minority populations.

4.9.1.3 Protection of Children

Martin Luther King Jr. Elementary School and a public park and playground are located near the Proposed Action site. Nearly a third of the population of Sunrise Manor CDP is under the age of 18, so it is likely that children reside in many of the residences located near the proposed SPVS site. The Nellis perimeter fence would be maintained around the SPVS, thereby keeping children out of the project area and away from any maintenance activities or electrical conduits. During construction, the Nellis perimeter fence would be maintained at all times, and gated access to the construction site would be used to prevent accidental entry by children and others from the public.

Neither the school nor the playground would experience any significant long-term noise or visual impacts as a result of the operation of the SPVS. Short-term minor impacts on children would occur from construction noise near the public park and playground, but the construction-related noise levels would be less than 75 dBA and temporary; therefore, noise levels would not be hazardous to the health of children using the public park. No long-term adverse impacts on children living near the project area are anticipated.

4.9.2 Modified Conduit Connection Alternative

The impacts on socioeconomics would be the same as the Proposed Action Alternative.

4.9.3 No Action Alternative

Under the No Action Alternative, there would be long-term adverse impacts on Nellis. Because a SPVS would not be constructed on USAF lands, and future costs for energy would likely increase; energy costs for Nellis would increase in the future.

4.10 HAZARDOUS AND TOXIC SUBSTANCES

4.10.1 Proposed Action Alternative

Since the Proposed Action area has been assessed for the presence of hazardous and toxic materials and found to contain none, there would be no disturbance of hazardous and toxic materials due to construction of the SPVS (Nellis 2010). During construction of the SPVS, personnel would ensure that temporary secondary containment equipment is used, where practicable, to ensure accidental releases of hazardous substances (i.e. anti-freeze, petroleum, oils, and lubricants) are prevented or limited in scope. Portable catch basins, portable containment berms, and other similar equipment would be used where feasible for refueling equipment. Personnel overseeing construction would have spill kits on site to provide expeditious response and cleanup should a spill occur. Personnel would be trained on spill notification procedures and cognizant of the Nellis and state pollution prevention requirements to reduce the potential for accidental spills. No hazardous and toxic substances would be used or generated during operation of the SPVS. Therefore, there would be no significant impacts on the Proposed Action site or surrounding area from hazardous and toxic substances.

4.10.2 Modified Conduit Connection Alternative

Impacts would be the same as described for the Proposed Action Alternative.

4.10.3 No Action Alternative

Because no soil disturbance or construction actions would take place, there would be no impacts from hazardous and toxic substances.

4.11 SAFETY

4.11.1 Proposed Action Alternative

During construction of the SPVS, all applicable Occupational Safety and Health Administration (OSHA) rules and regulations would be followed by NV Energy and project contractors. Heavy equipment operation areas and trenching locations would be secured to prevent inadvertent public access. All emergency and safety response within the SPVS would continue to be provided by Nellis. The SPVS would be enclosed by Nellis perimeter fencing and public access would not be allowed without approval by Nellis security.

As described previously, the solar panels would be less reflective than weathered white concrete, and as such would not pose a safety hazard to aviators on takeoff or landing at Nellis runways. Glare shields that are standard for USAF pilots would further reduce the glare from the solar panels. No significant impacts on safety during construction or operation of the SPVS would be expected.

4.11.2 Modified Conduit Connection Alternative

Impacts would be the same as described for the Proposed Action Alternative.

4.11.3 No Action Alternative

Under the No Action Alternative, no changes to civilian and military safety would occur.

4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The outgrant of the 160-acre site to NV Energy would result in a long-term commitment of Nellis resources for the length of the outgrant, but would not constitute an irretrievable commitment of resources for Nellis. Construction and operation of the SPVS and the placement of a feeder line from the SPVS to the substation would be an irretrievable commitment of various resources, including labor, capital, energy and land resources, by NV Energy and their contractors.

4.13 CUMULATIVE IMPACTS

A cumulative impact is defined in 40 CFR 1508.7 as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." By Memorandum dated June 24, 2005, from the Chairman of the CEQ to the Heads of Federal Agencies, entitled "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis", CEQ made clear its interpretation that "generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions", and that the "CEQ regulations do not require agencies to catalogue or exhaustively list and analyze all individual past actions."

Nellis currently utilizes energy from both the existing SPVS built in 2007 in Area III and the NV Energy grid. Cumulative beneficial effects on Nellis would result from the Proposed Action, in that a greater portion of future energy use for Nellis would be at a predetermined fixed cost, in exchange for the outgrant of Nellis lands to NV Energy for construction and operation of the SPVS. Through time, reduced costs for energy use could result in savings of several million dollars in USAF utility costs.

Several recently approved projects are being constructed on Nellis. The City of North Las Vegas is nearing completion of a Wastewater Recycling Facility (WRF) located adjacent to the Proposed Action site. The WRF is being built on Nellis lands and provides additional wastewater recycling to Nellis. Storm water detention basins are being constructed in Area III, as well as additional military family housing.

Clark County and the City of North Las Vegas are currently constructing or planning to construct numerous roads and road improvement projects, as well as capital improvements and public facilities, throughout the city and county over the next 3 to 5 years (Clark County 2010). A total of approximately 75 major projects are planned for the City of North Las Vegas, and 85 are planned for Clark County. Further, American Recovery and Reinvestment Act projects have been funded and implementation started throughout Clark County and include numerous transportation projects.

Over the course of the next 20 years, it is expected that Clark County will grow, both in population and geographical size. As part of that growth, new roads would be constructed, and existing roads would be expanded and improved. It is not known exactly where growth or expansion would occur, but the new SPVS would improve available energy supply to Clark County as energy that would have been utilized by Nellis would be made available to other consumers.

Minor cumulative adverse impacts would occur on land use and biological resources as a result of the Proposed Action. Readily available and low cost energy supplies lead to additional development of undeveloped lands. Although in urban areas such as Clark County, most of these lands are previously disturbed, some lands remain with native plant communities that support diverse wildlife use by species uniquely adapted for life in the Mojave Desert. Commercial and residential development of undeveloped lands permanently changes land use and degrades biological resources. Aesthetics of the Las Vegas Valley are also permanently altered through increased development as the visual quality of the wide open spaces and mountain vistas of the Mojave Desert are reduced. Because the Las Vegas Valley is already heavily developed, the areas to be used for the Proposed Action Alternative are highly disturbed, and the people heavily rely upon residential and commercial development to support a growing population, the cumulative impacts on land use and biological communities is considered to be minor.

Short-term cumulative impacts on transportation would occur as a result of the Proposed Action. Construction deliveries in combination with Nellis commuter traffic and ongoing highway construction projects would cause increased delays at intersections near Nellis during commute times.

Short-term cumulative impacts on noise would also occur. Construction noise is occurring from nearby commercial and industrial development, such as the WRF, and would occur at the proposed project site and in surrounding neighborhoods.

Cumulative socioeconomic benefits would accrue as a result of the Proposed Action to all persons living in the region, regardless of income status or race, due to increased energy availability, reduced costs of energy to the USAF and a greater use of renewable energy in the Las Vegas Valley. Long-term cumulative air quality benefits would also be realized as more renewable energy projects are constructed and operated in Clark County. These projects would collectively provide increased energy supplies without use of fossil fuels.

No significant adverse cumulative impacts would occur during the construction and operation of the SPVS, and only minor short-term adverse cumulative impacts on noise and transportation would be realized during construction of the SPVS. Long-term beneficial cumulative impacts would occur for Nellis and surrounding areas from reduced future energy costs and a greater use of renewable energy.

SECTION 5.0
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5.0 REFERENCES

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SECTION 6.0
LIST OF PREPARERS

6.0 LIST OF PREPARERS

The following people were primarily responsible for preparing this Environmental Assessment.

Name	Agency/Organization	Discipline/Expertise	Experience	Role In Preparing EA
Eric Webb, Ph.D.	Gulf South Research Corporation	Ecology/Wetlands	15 years experience in Natural Resources and NEPA Studies	Project Manager
Shalise Hadden	Gulf South Research Corporation	Ecology	1 year environmental studies	Biological resources
Stephen Oivanki	Gulf South Research Corporation	Geology	21 years environmental planning studies	Physical resources/Hazardous materials
Michael Hodson	Gulf South Research Corporation	Plant Ecology	7 years experience environmental studies	QA/QC
Chris Ingram	Gulf South Research Corporation	Biology/Ecology	31 years EA/EIS studies	QA/QC
Sharon Newman	Gulf South Research Corporation	GIS/Graphics	19 years GIS analysis	GIS and graphics
Steve Kolian	Gulf South Research Corporation	Water/Air Quality/Noise	10 years environmental planning studies	Water, air quality, noise
Shanna McCarty	Gulf South Research Corporation	Forestry/Ecology	4 years in NEPA studies	Report Revision and Review

APPENDIX A
INTERAGENCY AND PUBLIC COORDINATION

NOTICE OF AVAILABILITY

U.S. Air Force Invites the Public to Provide Comments on the Draft Environmental Assessment for the Outgrant for Construction and Operation of a Solar Photovoltaic System at Nellis Air Force Base, Clark County, Nevada.

The U.S. Air Force announces the availability of a draft Environmental Assessment for the outgrant of approximately 160 acres of U.S. Air Force land on Nellis Air Force Base for the construction and operation of a solar photovoltaic system comprised of solar panels and a new underground distribution power line. The system would provide 10 to 15 megawatts AC of renewable energy to Nellis Air Force Base. The proposed location for the solar photovoltaic system is in the southern portion of Area I of Nellis Air Force Base, south of Sunrise Vista Golf Course and north of E. Carey Avenue.

You may view the draft Environmental Assessment and draft Finding of No Significant Impact/Finding of No Practicable Alternative beginning October 25, 2010, at www.nellis.af.mil/library/environment.asp or request a copy from the address below. Copies will also be available for review at the Las Vegas Library, Reference Department, 833 Las Vegas Blvd. North, Las Vegas, NV 89191. Please provide any comments by November 24, 2010, to:

Mr. Charles Ramey
99 ABW/PA
4430 Grissom Ave, Suite 107
Nellis AFB, NV 89191
For general information, contact Mr. Ramey at: (702) 652-2750

DISTRIBUTION LIST

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Reference Department
833 Las Vegas Blvd North
Las Vegas, NV 89101

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Commissioner Rory Reid, Chairperson
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Las Vegas, NV 89155-5210

APPENDIX B
PUBLIC SCOPING MEETING COMMENTS

▶ SENATE RACE: *Contest pits populist's appeal against incumbent's power*

CONTINUED FROM PAGE 1B

Although Angle is revamping her grass-roots campaign with the help of national Republican Party leaders — she'll be in Washington this week for a series of high-level meetings — she said she's not about to remake herself into a moderate as November nears.

Defying conventional wisdom that a candidate must tack to the moderate

"I'm more mainstream than the fellow that said tourists stink, this war is lost, and light-skinned no-Negro dialect," Angle said, adding that's what a "whack-job, marginal candidate sounds like."

While Angle rode the radio circuit last week, behind the scenes the brain trust of her do-it-yourself campaign — including her husband, Ted, campaign manager Terry Campbell and spokesman Stacy

6/13 GISRC

El Tiempo

A Spanish language publication of the RENO Journal

EL TIEMPO PROOF OF PUBLICATION

I, Maggie Wimmer, hereby swear and depose

that the attached advertisement

was published for

GULF SOUTH RESEARCH

in **El Tiempo,** a Spanish Newspaper, on the

following date(s):

June 11, 2010

Verified this 11th day of June, 2010 by

/s/ Maggie Wimmer

Maggie Wimmer

El Tiempo Advertising

/s/ Ana Quiquivix-Martinez

Ana Quiquivix-Martinez

Notary Public

ANA QUIQUIVIX-MARTINEZ
Notary Public State of Nevada
No. 05-94128-1
My appt. exp. Dec. 13, 2012

U.S. Air Force Invites the Public to Attend a Scoping Meeting on the Environmental Assessment for the use of Nellis Air Base Land for Construction and Operation of a Solar Photovoltaic System, Clark County, Nevada.

The U.S. Air Force invites the public to attend a scoping meeting for the use of approximately 160 acres of land on Nellis Air Force Base for construction and operation of a solar photovoltaic system comprised of solar panels and a new underground distribution power line. The system would provide 10 to 15 megawatts AC of renewable energy to Nellis Air Force Base. The proposed location for the solar photovoltaic system is in the southern portion of Area I of Nellis Air Force Base, south of Sunrise Vista Golf Course and north of E. Carey Avenue.

The public is invited to the scoping meeting to provide input and comments on resources potentially affected by the proposed solar photovoltaic system and to learn more about the proposed project. The scoping meeting will be held at the multipurpose room at Martin Luther King Jr. Elementary School, 2260 Betty Lane, Las Vegas, NV 89156 from 6:30 p.m. to 9 p.m. on June 15, 2010. The meeting will be an open house format with multiple stations describing components of the proposed project.

Fuerza Aérea de los Estados Unidos invita al público a asistir a una reunión de alcance sobre el uso de terreno en las Base Aérea de Nellis para la Construcción y Operación de un Sistema Solar Fotovoltaica, en el condado de Clark, Nevada.

Fuerza Aérea de los Estados Unidos invita al público a asistir a una reunión de alcance para el uso de aproximadamente 160 acres de tierra en la base aérea de Nellis para la construcción y operación de un sistema solar fotovoltaico compuesto por paneles solares y una nueva línea de metro de distribución de energía. El sistema permitiría a los 10 a 15 megavatios de corriente alterna de energía renovables a la base aérea de Nellis. La localización propuesta para el sistema fotovoltaico solar está en la porción sur de la zona 1 de la base aérea de Nellis, sur del Campo de golf Sunrise Vista y al norte de la Avenida E. Carey.

Se invita a la comunidad a asistir a una reunión pública donde se dará a conocer el proyecto propuesto relacionado al Sistema Solar Fotovoltaico. Asimismo, los asistentes podrán proporcionar comentarios y otras aportaciones acerca del proyecto propuesto. Esta reunión se llevará a cabo en la Sala de Usos Múltiples de la Escuela Elemental Martin Luther King Jr., 2260 Betty Lane, Las Vegas, NV 89156 el 15 de junio, 2010, de las 6:30 a las 9 de la noche. Este evento será de puertas abiertas con múltiples estaciones describiendo los componentes del proyecto.

PUB: June 11, 2010 El Tiempo

AFFP DISTRICT COURT
Clark County, Nevada

AFFIDAVIT OF PUBLICATION

STATE OF NEVADA)
COUNTY OF CLARK) SS:

STACEY M. LEWIS, being 1st duly sworn, deposes and says: That she is the Legal Clerk for the Las Vegas Review-Journal and the Las Vegas Sun, daily newspapers regularly issued, published and circulated in the City of Las Vegas, County of Clark, State of Nevada, and that the advertisement, a true copy attached for,

GULF SO RESEARCH CORP 7578088GUL 6383640

was continuously published in said Las Vegas Review-Journal and / or Las Vegas Sun in 1 edition(s) of said newspaper issued from 06/06/2010 to 06/06/2010, on the following days:

06/06/2010

Signed: Stacey M. Lewis

SUBSCRIBED AND SWORN BEFORE ME THIS, THE

9th day of June, 2010.

Emily Gonzalez

Notary Public

EMILY GONZALEZ
Notary Public State of Nevada
No. 09-8940-1
My appt. exp. Nov. 13, 2012

U.S. Air Force Invites the Public to Attend a Scoping Meeting on the Environmental Assessment for the use of Nellis Air Base Land for Construction and Operation of a Solar Photovoltaic System, Clark County, Nevada.

The U.S. Air Force invites the public to attend a scoping meeting for the use of approximately 160 acres of land on Nellis Air Force Base for construction and operation of a solar photovoltaic system comprised of solar panels and a new underground distribution power line. The system would provide 10 to 15 megawatts AC of renewable energy to Nellis Air Force Base. The proposed location for the solar photovoltaic system is in the southern portion of Area I of Nellis Air Force Base, south of Sunrise Vista Golf Course and north of E. Carey Avenue.

The public is invited to the scoping meeting to provide input and comments on resources potentially affected by the proposed solar photovoltaic system and to learn more about the proposed project. The scoping meeting will be held at the multipurpose room at Martin Luther King Jr. Elementary School, 2260 Betty Lane, Las Vegas, NV 89156 from 6:30 p.m. to 9 p.m. on June 15, 2010. The meeting will be an open house format with multiple stations describing components of the proposed project.

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Fuerza Aérea de los Estados Unidos invita al público a asistir a una reunión de alcance pará el uso de aproximadamente 160 acres de tierra en la base aérea de Nellis para la construcción y operación de un sistema solar fotovoltaico compuesto por paneles solares y una nueva línea de metro de distribución de energía. El sistema permitiría a los 10 a 15 megavatios de corriente alterna de energía renovables a la base aérea de Nellis. La localización propuesta para el sistema fotovoltaico solar está en la porción sur de la zona 1 de la base aérea de Nellis, sur del Campo de golf Sunrise Vista y al norte de la Avenida E. Carey.

Se invita a la comunidad a asistir a una reunión pública donde se dará a conocer el proyecto propuesto relacionado al Sistema Solar Fotovoltaico. Asimismo, los asistentes podrán proporcionar comentarios y otras aportaciones acerca del proyecto propuesto. Esta reunión se llevará a cabo en la Sala de Usos Múltiples de la Escuela Elemental Martin Luther King Jr., 2260 Betty Lane, Las Vegas, NV 89156 el 15 de junio, 2010, de las 6:30 a las 9 de la noche. Este evento será de puertas abiertas con múltiples estaciones describiendo los componentes del proyecto.

Preguntas, Comentarios o Sugerencias

Nellis Air Force Base y NV Energy están interesados en hacer frente a sus inquietudes y preguntas con respecto a la Nellis Sistemas De Energía Solar II Evaluación Ambiental. Sugerencias sobre las alternativas, las cuestiones de recursos, la participación del público, etc. Se alienta también. Su opinión es una parte importante del proceso Nacional de Medio Ambiente el cumplimiento la Ley de Política. Por favor escriba sus preguntas, comentarios o sugerencias sobre el espacio de abajo. Si desea que se le informe sobre este estudio por favor escriba su nombre y dirección. Eres libre de usar el reverso de este formulario o añadir páginas si es necesario. También puede tomar esta forma con usted y devolverlo a la dirección abajo.

Martes 15 de Junio del 2010.

Mi Nombre es: Rosalba Aguilar

Me gustaria que información importante como está de la planta de energia solar senos aga llegar información anticipada por correo porque está información, no sabia nada ~~nada~~ hasta que una señora llego ala casa a darme un folleto y nos dijo de esta reunion ala que acudimos gracias por su atención

Nombre: Rosalba Aguilar Calderon Afiliación: _____

Dirección: [redacted] Ciudad: [redacted] Estado: [redacted]

Código postal: [redacted] Teléfono: [redacted] Correo Electrónico: _____

Punto de Contacto:

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99th Air Base Wing/Public Affairs (99 ABW/PA)
4430 Grissom Ave., Suite 107
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702-652-7431
Charles.ramey@nellis.af.mil

Preguntas, Comentarios o Sugerencias

Nellis Air Force Base y NV Energy están interesados en hacer frente a sus inquietudes y preguntas con respecto a la Nellis Sistemas De Energía Solar II Evaluación Ambiental. Sugerencias sobre las alternativas, las cuestiones de recursos, la participación del público, etc. Se alienta también. Su opinión es una parte importante del proceso Nacional de Medio Ambiente el cumplimiento la Ley de Política. Por favor escriba sus preguntas, comentarios o sugerencias sobre el espacio de abajo. Si desea que se le informe sobre este estudio por favor escriba su nombre y dirección. Eres libre de usar el reverso de este formulario o añadir páginas si es necesario. También puede tomar esta forma con usted y devolverlo a la dirección abajo.

Segun lo que pude entender es bueno para ahorrar energia. para entender bien de que se trata es necesario obtener mas informacion antes de hacer sugerencias

Nombre: Maria Duran Afiliación:

Dirección: [redacted] Ciudad: [redacted] Estado: [redacted]

Código postal: [redacted] Teléfono: [redacted] Correo Electrónico:

Punto de Contacto:

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702-652-7431
Charles.ramey@nellis.af.mil

PUBLIC SCOPING MEETING
ENVIRONMENTAL ASSESSMENT
NELLIS AIR FORCE BASE SOLAR POWER SYSTEM II
MARTIN LUTHER KING JR ELEMENTARY SCHOOL
June 15, 2010

	Name (Please Print)	Address (Mailing)	Representing	Would you like to receive a copy of the Environmental Assessment?
1	MARK FOSTER	[redacted]	MOJAVE ELECTRIC	YES
2	Tod Oppenborn		Nellis	yes
3	STAR ALI MISTRIEL-KOGAN		Neighborhood AND AM TEACHER AT MLK JR ES	YES
4	Mel Hutchinson		Bombard Electric	Yes
5	Earl Hodge		Self	Yes
6	DAVID SIMS		NV ENERGY	YES
7	Brenda Shank		"	Yes
8	Rosalba Aguilar C.			

PUBLIC SCOPING MEETING
ENVIRONMENTAL ASSESSMENT
NELLIS AIR FORCE BASE SOLAR POWER SYSTEM II
MARTIN LUTHER KING JR ELEMENTARY SCHOOL
June 15, 2010

	Name (Please Print)	Address (Mailing)	Representing	Would you like to receive a copy of the Environmental Assessment?
9	Maria Durga	[redacted]		
10	Carol Theobald		Self	
11	Stanley Ford		Self	
12			ME!	????
13				
14				
15				
16				

PUBLIC SCOPING MEETING
ENVIRONMENTAL ASSESSMENT
NELLIS AIR FORCE BASE SOLAR POWER SYSTEM II
MARTIN LUTHER KING JR ELEMENTARY SCHOOL
June 15, 2010

	Name (Please Print)	Address (Mailing)	Representing	Would you like to receive a copy of the Environmental Assessment?
25	Kathy Hottenberg	[redacted]	Neighbor Hood	yes
26	Miguel A. Mota		owner	yes
27				
28				
29				
30				
31				
32				

Case: GSR Corp. Public Scoping Meeting

Transcript Testimony of **Public Scoping Meeting**

Date: June 15, 2010
Volume: 1

Job #: 573887

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PUBLIC SCOPING MEETING

PUBLIC COMMENTS

June 15, 2010

6:30 p.m. - 9:15 p.m.

Held at

Martin Luther King, Jr.

Elementary School

2260 Betty Lane

Las Vegas, Nevada 89156

Comments reported by: Ellen Ford, CCR #846

MR. MATA: My name is Miguel Mata. M-i-g-u-e-l, M-a-t-a. I live on [redacted]. I own another property on [redacted], as well.

And I wasn't notified. They were saying that they put an ad in the paper. And, I mean, the proper way -- you know, we're in the 21st Century. Nobody reads the newspaper anymore. Pretty much everybody goes online to check for some things.

Or, you know, they have the addresses of the owners of who owns the houses, whoever owns the house in these neighborhoods. And so they have the records with the Assessor's Office so they can send a flyer. And instead of putting the ads in the newspaper when nobody's going to read it. Because nobody reads it anymore. Even to look for work, nobody going to the newspaper anymore, pretty much it's online.

And I think that would be better and would be a good idea if they notified us, you know, whoever owns the place in these neighborhoods so they would be the ones more interested.

Because we are close. We already putting up with noise from the Nellis Air Force, and we

want to know why it's going to benefit the neighborhoods.

And also, if studies are being conducted, and which are going to affect us or benefit all the neighborhoods.

Another thing. If it's going to create jobs for local people or for people that lives out of the states, like Arizona, Utah, California. And if that's going happen, I mean, what that's going to do us any good if they're going to create jobs for people that lives there, and the money's going to go out of the state.

So pretty much that's what I had I would suggest. And just to notify with at least with the flyer that it's going to be held a meeting, like he was saying, in July.

Because with this short notice, if the person wouldn't walking to my house and hand me the flying, I wouldn't know about this.

And we're really concerned about anything what's going on. Right now, we're trying to get together for the neighborhood watch program for our neighborhood because there is too much crime around it.

And, you know, I think it's important for our neighborhood. Not just for people that is gonna get benefits and it's gonna create jobs for people that doesn't live here in the state.

We even have people that works on the Senate from different states, and they work here, but they live somewhere else. So people that works in the County, as well. So that's what was my comment about.

MS. MISTRIEL-KOGAN: My name is Star Mistriel-Kogan. S-t-a-r, M-i-s-t-r-i-e-l dash K-o-g-a-n. I'm a teacher at CCSD. My address is [redacted]. My phone number is area code [redacted].

And my concerns are inadequate public announcement. That I had to go to each and every one of my neighbors on [redacted] from [redacted] to [redacted], door to door and let them know there was a meeting.

Each and every one of them responded to me that they had no idea there was a meeting. They did not receive any notice, nor do they get the newspaper, nor did they see it on TV, so they were upset.

Many of my neighbors were unable to come because they're aged and fragile. Some just recently had a heart attack and are attached to machines, totally unable to come. Cried and felt bad about it. Because they got all their money in their homes. This is all they've got. They have no opportunity to speak.

The next issue is about the effects of the solar panels on the houses, on the paint of the homes, on people's vehicles. Also, how the panels will affect the directionality of the winds and the landscaping of people's homes, how that will affect it, as well.

And then the next thing is how they will landscape or secure the perimeter of those solar panels, since there is the threat of terrorism. And right now, the current access to the power easement way is horrible. There's no security at all. The chain link is constantly cut by wire cutters, the gates are always open, the locks are always broken, and nobody from Nevada Power, nor anybody from Nellis Air Force Base attends it ever.

I was -- am accosted -- I was accosted by -- let's see. What's this guy's name here?

Charles Ramey of Nellis Air Force Base, who is the Director of Public Affairs. R-a-m-e-y. He was rude to me. He got in my face. And he did this on several occasions.

He crossed his arms the entire time, and spoke in a harsh tone, and he blocked my way, and I was offended by that.

I did contact Channel 13 News regarding this situation, so they'll be following up.

And I spoke with David Sims, S-i-m-s, who is with Nevada Energy, who was more effective as a public relations person, and wrote down my complaints to look into it and address it. He handed me his card, as well as he was willing to explain the details of the project more clearly without getting in my face.

I did walk from [redacted] to [redacted]. I did go to each and every house, knock on each and every door, yelled even to people that I was a neighbor and that there was a meeting.

Some doors did not open to me. They're in there, but they're afraid. They said, "Okay." And I did not get bitten by any dogs. And I have two bad knees, so I'm in pain. That's it for me.

CERTIFICATE

OF

CERTIFIED SHORTHAND REPORTER

* * * * *

I, the undersigned certified shorthand reporter in and for the State of Nevada, do thereby certify: that the foregoing proceedings were taken before me at the time and place herein set forth; that the testimony of the witnesses were recorded stenographically by me and were thereafter transcribed under my direction; that the foregoing is a true record of the testimony.

I further certify that I am a disinterested person and am in no way interested in the outcome of said action, or connected with or related to any of the parties in said action, or to their respective counsel.

The dismantling, unsealing or unbinding of the original transcript will render the reporter's certificate null and void.

In witness thereof, I have subscribed my name on this date: June 27, 2010.

_____

Ellen L. Ford, RPR, CRR

CCR No. 846

APPENDIX C
NOISE EMISSIONS CALCULATIONS

CALCULATION SHEET-COMBUSTIBLE EMISSIONS-CONSTRUCTION

Assumptions for Combustible Emissions					
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs
Water Truck	1	300	8	130	312000
Diesel Road Compactors	1	100	8	90	72000
Diesel Dump Truck	24	300	8	90	5184000
Diesel Excavator	1	300	8	90	216000
Diesel Hole Trenchers	1	175	8	15	21000
Diesel Bore/Drill Rigs	1	300	8	15	36000
Diesel Cement & Mortar Mixers	1	300	8	30	72000
Diesel Cranes	1	175	8	30	42000
Diesel Graders	3	300	8	90	648000
Diesel Tractors/Loaders/Backhoes	1	100	8	90	72000
Diesel Bull Dozers	2	300	8	90	432000
Diesel Front End Loaders	2	300	8	90	432000
Diesel Fork Lifts	2	100	8	130	208000
Diesel Generator Set	2	40	8	130	83200

Emission Factors							
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO2 g/hp-hr	CO2 g/hp-hr
Water Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Road Compactors	0.370	1.480	4.900	0.340	0.330	0.740	536.200
Diesel Dump Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Excavator	0.340	1.300	4.600	0.320	0.310	0.740	536.300
Diesel Trenchers	0.510	2.440	5.810	0.460	0.440	0.740	535.800
Diesel Bore/Drill Rigs	0.600	2.290	7.150	0.500	0.490	0.730	529.700
Diesel Cement & Mortar Mixers	0.610	2.320	7.280	0.480	0.470	0.730	529.700
Diesel Cranes	0.440	1.300	5.720	0.340	0.330	0.730	530.200
Diesel Graders	0.350	1.360	4.730	0.330	0.320	0.740	536.300
Diesel Tractors/Loaders/Backhoes	1.850	8.210	7.220	1.370	1.330	0.950	691.100
Diesel Bull Dozers	0.360	1.380	4.760	0.330	0.320	0.740	536.300
Diesel Front End Loaders	0.380	1.550	5.000	0.350	0.340	0.740	536.200
Diesel Fork Lifts	1.980	7.760	8.560	1.390	1.350	0.950	690.800
Diesel Generator Set	1.210	3.760	5.970	0.730	0.710	0.810	587.300

CALCULATION SHEET-COMBUSTIBLE EMISSIONS-CONSTRUCTION

Emission factors (EF) were generated from the NONROAD2005 model for the 2006 calendar year. The VOC EFs includes exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2005 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2005 model is based on the population in U.S. for the 2006 calendar year.

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO2 tons/yr	CO2 tons/yr
Water Truck	0.151	0.712	1.888	0.141	0.138	0.254	184.290
Diesel Road Paver	0.029	0.117	0.389	0.027	0.026	0.059	42.544
Diesel Dump Truck	2.514	11.825	31.363	2.342	2.285	4.227	3062.044
Diesel Excavator	0.081	0.309	1.095	0.076	0.074	0.176	127.657
Diesel Hole Cleaners\Trenchers	0.012	0.056	0.134	0.011	0.010	0.017	12.399
Diesel Bore/Drill Rigs	0.024	0.091	0.284	0.020	0.019	0.029	21.014
Diesel Cement & Mortar Mixers	0.048	0.184	0.578	0.038	0.037	0.058	42.029
Diesel Cranes	0.020	0.060	0.265	0.016	0.015	0.034	24.540
Diesel Graders	0.250	0.971	3.378	0.236	0.229	0.528	382.970
Diesel Tractors/Loaders/Backhoes	0.147	0.651	0.573	0.109	0.106	0.075	54.835
Diesel Bull Dozers	0.171	0.657	2.266	0.157	0.152	0.352	255.313
Diesel Front End Loaders	0.181	0.738	2.380	0.167	0.162	0.352	255.266
Diesel Aerial Lifts	0.454	1.779	1.962	0.319	0.309	0.218	158.342
Diesel Generator Set	0.111	0.345	0.547	0.067	0.065	0.074	53.847
Total Emissions	**4.193**	**18.496**	**47.101**	**3.724**	**3.628**	**6.455**	**4677.089**

Conversion factors	
Grams to tons	1.102E-06

CALCULATION SHEET-TRANSPORTATION COMBUSTIBLE EMISSIONS-CONSTRUCTION

Construction Worker Personal Vehicle Commuting to Construction Site-Passenger and Light Duty Trucks									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	Passenger Cars g/mile	Pick-up Trucks, SUVs g/mile	Mile/day	Day/yr	Number of cars	Number of trucks	Total Emissions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	1.36	1.61	60	160	20	20	0.29	0.34	0.63
CO	12.4	15.7	60	160	20	20	2.62	3.32	5.95
NOx	0.95	1.22	60	160	20	20	0.20	0.26	0.46
PM-10	0.0052	0.0065	60	160	20	20	0.00	0.00	0.00
PM 2.5	0.0049	0.006	60	160	20	20	0.00	0.00	0.00
CO2	369	511	60	160	20	20	78.07	108.12	186.19

Heavy Duty Trucks Delivery Supply Trucks to Construction Site									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	10,000-19,500 lb Delivery Truck	33,000-60,000 lb semi trailer rig	Mile/day	Day/yr	Number of trucks	Number of trucks	Total Emissions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	0.29	0.55	60	160	2	2	0.01	0.01	0.02
CO	1.32	3.21	60	160	2	2	0.03	0.07	0.10
NOx	4.97	12.6	60	160	2	2	0.11	0.27	0.37
PM-10	0.12	0.33	60	160	2	2	0.00	0.01	0.01
PM 2.5	0.13	0.36	60	160	2	2	0.00	0.01	0.01
CO2	536	536	60	160	2	2	11.34	11.34	22.68
Daily Commute New Staff Associated with Proposed Action									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	Passenger Cars g/mile	Pick-up Trucks, SUVs g/mile	Mile/day	Day/yr	Number of Cars	Number of trucks	Total Emissions cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	1.36	1.61	60	240	2	2	0.04	0.05	0.09
CO	12.4	15.7	60	240	2	2	0.39	0.50	0.89
NOx	0.95	1.22	60	240	2	2	0.03	0.04	0.07
PM-10	0.0052	0.0065	60	240	2	2	0.00	0.00	0.00
PM 2.5	0.0049	0.006	60	240	2	2	0.00	0.00	0.00
CO2	369	511	60	240	2	2	11.71	16.22	27.93

Truck Emission Factor Source: MOBILE6.2 USEPA 2005 Emission Facts: Average annual emissions and fuel consumption for gasoline-fueled passenger cars and light trucks. EPA 420-F-05-022 August 2005. Emission rates were generated using MOBILE.6 highway.

CALCULATION SHEET-TRANSPORTATION COMBUSTIBLE EMISSIONS-CONSTRUCTION

Conversion factor:	gms to tons
	0.000001102

Carbon Equivalents	Conversion Factor
N2O or NOx	311
Methane or VOCs	25

Source: EPA 2010 Reference, Tables and Conversions, Inventory of U.S. Greenhouse Gas Emissions and Sinks;
http://www.epa.gov/climatechange/emissions/usinventoryreport.html

CARBON EQUIVALENTS

Construction Commuters	Conversion	Emissions CO2 tons/yr	Total CO2
VOCs	25	15.71	
NOx	311	0.46	
Total		16.17	202.36

Delivery Trucks	Conversion	Emissions CO2 tons/yr	Total CO2
VOCs	25	0.44	
NOx	311	115.62	
Total		116.06	138.74

Kirtland AFB staff and Students	Conversion	Emissions CO2 tons/yr	Total CO2
VOCs	25	2.36	
NOx	311	21.42	
Total		23.78	51.70

CALCULATION SHEET-FUGITIVE DUST-CONSTRUCTION

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM10/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM10/acre-month	MRI 1996; EPA 2001; EPA 2006

PM2.5 Emissions

PM2.5 Multiplier	0.10	(10% of PM10 emissions assumed to be PM2.5)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM10 and PM2.5 emissions)	EPA 2001; EPA 2006

Project Assumptions

Construction Area (0.19 ton PM10/acre-month)

			Conversion Factors	
Duration of Soil Disturbance in Proje	3	months	0.000022957	acres per feet
Length	0	miles	5280	feet per mile
Length (converted)	0	feet		
Width	0	feet		
Area	160.00	acres		

Staging Areas

Duration of Construction Project	6	months
Length		miles
Length (converted)		feet
Width		feet
Area	2.00	acres

	Project Emissions (tons/year)			
	PM10 uncontrolled	PM10 controlled	PM2.5 uncontrolled	PM2.5 controlled
Construction Area (0.19 ton PM10/ac	91.20	45.60	9.12	4.56
Staging Areas	0.38	0.19	0.04	0.02
Total	**91.58**	**45.79**	**9.16**	**4.58**

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.*Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM10/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM10/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions from Construction Operations, calculated the 0.19 ton PM10/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM10/acre-month) and 75% of the average emission factor (0.11 ton PM10/acre-month).

The 0.19 ton PM10/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM10/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particle (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District and the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM10 and PM2.5 in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM10/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM2.5 Multiplier **0.10**

PM2.5 emissions are estimated by applying a particle size multiplier of 0.10 to PM10 emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM10 and PM2.5 **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM10 and PM2.5 in PM nonattainment areas. Wetting controls will be applied during project construction (EPA 2006).

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

PM-10 EMISSION CALCULATIONS FOR UNPAVED ROADS

Unpaved Surfaces at Industrial Sites

Source: AP-42, 13.2.2 Unpaved Surfaces
Equation: $E = k\ (s/12)^a * (W/3)^b$

Units	PM-2.5	PM-10	Case Scenario
lb/VMT	0.02	0.23	Low
lb/VMT	0.32	3.15	High

VMT=Vehicle Miles Traveled

Unpaved Surfaces at Public Roads Dominated by Light Duty Vehicles

Equation: $E = \frac{k\ (s/12)^a * (S/30)^d}{(M/0.5)^c}$

Units	PM-2.5	PM-10	Case Scenario	Average PM-2.5	Average PM-10
lb/VMT	0.45	4.50	Low	0.2	6.3
lb/VMT	0.02	8.02	High		

Calculation:

	Assumptions					
Miles of travel per day in project area	PM-2.5/lbs/day	PM-10/lbs/day	PM-2.5/tons/year	PM-10/tons/year	Dust Control Efficiency (%)	**PM-10 tons/year (controled)**
20	5	125	0.9	22.8	71%	**6.63**

PM-10 EMISSION CALCULATIONS FOR UNPAVED ROADS

k=

Industrial Roads			Public Roads		
PM-2.5	PM-10	PM-30	PM-2.5	PM-10	PM-30
0.15	1.5	4.9	0.18	1.8	6

Source: 13.2.2-2

a=

Industrial Roads			Public Roads		
PM-2.5	PM-10	PM-30	PM-2.5	PM-10	PM-30
0.9	0.9	0.7	1	1	1

Source: 13.2.2-2

b=

Industrial Roads			Public Roads		
PM-2.5	PM-10	PM-30	PM-2.5	PM-10	PM-30
0.45	0.45	0.45			

Source: 13.2.2-2

c=

Industrial Roads			Public Roads		
PM-2.5	PM-10	PM-30	PM-2.5	PM-10	PM-30
			0.2	0.2	0.3

Source: 13.2.2-2

d=

Industrial Roads			Public Roads		
PM-2.5	PM-10	PM-30	PM-2.5	PM-10	PM-30
			0.5	0.5	0.3

Source: 13.2.2-2

E= size-specific emission factor (lb/VMT)

PM-10 EMISSION CALCULATIONS FOR UNPAVED ROADS

s= surface material silt content (%)	Industrial Roads		Public Roads	
	Low	High	Low	High
Source Table 13.2.2.-3	1.8	25.2	1.8	35

W= mean vehicle weight (tons)	Industrial Roads		Public Roads	
	Low	High	Low	High
Source Table 13.2.2.-3	2	290	1.5	3

M= surface material moisture content (%)	Industrial Roads		Public Roads	
	Low	High	Low	High
Source Table 13.2.2.-3	0.03	13	0.03	13

S = mean vehicle speed (mph)	Industrial Roads		Public Roads	
	Low	High	Low	High
Source Table 13.2.2.-3	5	43	10	55

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (lb/VMT)	PM -2.5	PM-10
	0.00036	0.00047

Control Efficiency of Dust Suppressants

Application (gal/square yard)	Average Control Efficency %
0.073	62%
0.11	68%
0.15	74%
0.18	80%
Median	71%

Source; AP 42 Table 13.2-2-5

PM-10 Emmissions From Wind Blown Dust

	Emission Factor		PM-10 Emissions		
	lbs/acre/day	Acres on Site	PM-10/day (lbs)	PM-10/year (lbs)	PM-10/year (tons)
Project Site	1.66	160	265.6	96,944	48.5

Emission Factor Reference: Personal communication from Stephen Deyo of the Department of Air Quality and Environmental Management of Clark County

CALCULATION SHEET-SUMMARY OF EMISSIONS

Construction Emissions for Criteria Pollutants (tons per year)									
Emission Source	VOC	CO	NOx	PM-10	PM-2.5	SO2	CO2	CO2 Equivalents	Total CO2
Combustible Emissions	4.19	18.50	47.10	3.72	3.63	6.45	4677.09	14753.33	19430.42
Construction Site-Fugitive PM-10	NA	NA	NA	45.79	4.58	NA	NA	NA	NA
Construction Workers Commuter & Trucking	0.65	6.04	0.83	0.01	0.01	NA	186.19	274.56	460.76
Total emissions-CONSTRUCTION	**4.84**	**24.54**	**47.93**	**49.53**	**8.22**	**6.45**	**4863**	**15028**	**19891**
Ongoing emissions from commuters	**0.09**	**0.89**	**0.07**	**0.00**	**0.00**	**NA**	27.93	142.41	170.34
Emissions from Unpaved Roads	NA	NA	NA	**6.63**	**0.86**	NA	NA	NA	NA
Emissions From Wind Blown Dust	NA	NA	NA	**48.47**	NA	NA	NA	NA	NA
Total Operational Emissions	**0.09**	**0.89**	**0.07**	**55.10**	**0.86**	**0.00**	**27.93**	**142.41**	**170.34**
De minimis Threshold (1)	100	100	100	70	100	100	NA	NA	25,000

1. Clark County is in non-attainment for CO (moderate), Ozone (Moderate), PM-10 (Serious)

Carbon Equivalents	Conversion Factor
N2O or NOx	311
Methane or VOCs	25

Source: EPA 2010 Reference, Tables and Conversions, Inventory of U.S. Greenhouse Gas Emissions and Sinks; http://www.epa.gov/climatechange/emissions/usinventoryreport.html