FINAL ENVIRONMENTAL ASSESSMENT
FOR
NELLIS RECLAIMED WATERLINE PROJECT

PREPARED BY:

Greeley and Hansen, LLC

DECEMBER, 2017

Letters or other written comments provided may be published in the Final EA. As required by law, substantive comments would be addressed in the Final EA and made available to the public. Any personal information provided would be kept confidential. Private addresses would be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments would be disclosed. Personal home addresses and phone numbers would not be published in the Final EA.

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FINAL FINDING OF NO SIGNIFICANT IMPACT (FONSI)

NELLIS RECLAIMED WATERLINE PROJECT

NELLIS AFB, NEVADA

Pursuant to provisions of the National Environmental Policy Act (NEPA), Title 42 United States Code (USC) Sections 4321 to 4347, implemented by Council on Environmental Quality (CEQ) Regulations, Title 40, Code of Federal Regulations (CFR) §1500-1508, and 32 CFR §989, Environmental Impact Analysis Process, the U.S. Air Force (Air Force) assessed the potential environmental consequences associated with the construction of a pipeline to carry reclaimed water from a water reclamation facility operated by the City of North Las Vegas (CNLV-WRF) to the grounds of the Nellis AFB Golf Course (NAGC), Nellis AFB, Clark County, Nevada.

This project is designed to fulfill the conditions of the Enhanced Use Lease (EUL) between Nellis AFB and the City of North Las Vegas (CNLV), in which the United States Air Force (USAF) allowed CNLV to construct the CNLV-WRF on land leased from Nellis AFB. Per this agreement, CNLV-WRF is commissioned to deliver reclaimed water back to Nellis AFB for uses in which non-potable water is suitable. To use this reclaimed water, USAF is proposing the construction of a pipeline between the CNLV-WRF and NAGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

The Environmental Assessment (EA), incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with the Nellis Reclaimed Waterline Project and provides environmental protection measures to avoid or reduce adverse environmental impacts.

The EA considers all potential impacts of Alternative 1, Alternative 2, Alternative 3, and the No-Action Alternative. The EA also considers cumulative environmental impacts with other projects in the Region of Influence.

ALTERNATIVE 1 – Pipeline Route A

The City of North Las Vegas proposes to construct and maintain approximately 12,100 linear feet of 10-inch diameter PVC reclaimed water main at one of two locations. The three alignments being considered are shown on Figure 1. This reclaimed water main would be connected to the existing pump station at CNLV-WRF, and would supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. Raptor Pond is located to the northwest of the SVGC clubhouse, and Eagle Pond is located to the northeast of the clubhouse.

In order to construct the reclaimed water line, excavation and backfilling of earth between the CNLV-WRF and SVGC would be required. This excavation would be in the form of a trench, approximately two (2) feet wide, by five (5) feet deep, by 12,100 feet long. Based on these dimensions, between 4,400 and 5,000 cubic yards (yd^3) of earth would be removed, depending on which route is selected. The trench would be built from CNLV-WRF to SVGC, with a branch to each pond. After construction and installation of the pipeline, the trench would be backfilled with excavated material and the disturbed vegetation returned to its existing condition or better. The construction of this pipeline would most likely utilize various motorized construction equipment such as water trucks, dump trucks, excavators, cement and mortar mixers, tractors,

backhoes, front-end loaders, fork lifts, and generator sets. This equipment would be used to excavate the trench for the pipeline alignment, install the pipe and conduit, backfill the trench, and repair/replace concrete or asphalt cart paths and roadways.

In either alignment, the pipeline would utilize a cut and excavate method for crossing of the Sloan Channel. This crossing would be fully encased with a minimum depth of 3.5 feet from the bottom of the channel, as suggested by Clark County Public Works standards. In the unlined channels at each pond, the water line would be constructed below the scouring depth and would be placed in a concrete encasement to mitigate the issue of erosional scour caused by flowing water.

Construction of the pipeline shall be timed to avoid the migratory bird breeding and nesting season (September 1 to February 28), or as much of the season as feasible. Should project planning and scheduling cause all or any portion of the Project to be constructed during the migratory bird breeding and nesting season, then Project activities would be subject to potential exclusionary buffer(s) when and where active nests are discovered during the course of construction. If project activities occur within the migratory bird breeding season, then a qualified bird biologist would be required to be present to ensure neither bird breeding nor nesting is occurring. The construction period should last approximately 6 to 8 months.

ALTERNATIVE 2 – Pipeline Route B

The actions of Alternative 3 are similar to that of Alternatives 1 & 2, and shall be assumed to be identical unless otherwise described in this section. In Figure 1, Alternative 2 is represented by Route B. This alignment was proposed by Greeley and Hansen, the engineering firm consulting on pipeline design and construction. The alignment starts at the northeast corner of the CNLV-WRF, and runs to the north along the west side of the existing Sloan Channel. The alignment crosses the Sloan Channel and continues north to the SVGC grounds. The pipeline to Raptor Pond would continue to the west side of the Sloan Channel, and the pipeline to Eagle Pond would cross the Sloan-Range Wash near the confluence of the two washes at the fairway crossing. It would then remain on the south side of Range Wash, heading east, then south, between the existing tee and green to Eagle Pond.

Route B follows the same path as a conduit alignment alternative that was considered, but not used, for the utility conduit used in Phase II of the solar photovoltaic power station at the south end of the Nellis AFB property. This alignment would be within as area that has been previously disturbed, but may have additional unknown subsurface utility conflicts which could increase the cost and duration of construction.

ALTERNATIVE 3 – Pipeline Route C

The actions of Alternative 3 are similar to that of Alternatives 1 & 2, and shall be assumed to be identical unless otherwise described in this section.

In Figure 1, Alternative 3 is represented by Route C. This alignment was proposed by Greeley and Hansen, the engineering firm consulting on pipeline design and construction. The alignment starts at the northeast corner of the CNLV-WRF, and runs to the north along the west side of the existing Sloan Channel. The alignment crosses the Sloan Channel and continues in the same alignment as Route A.

Construction of the pipeline shall be scheduled to avoid the migratory bird breeding and nesting season (September 1 to February 28), or as much of the season as feasible. Should project

planning and scheduling cause all or any portion of the Project to be constructed during the migratory bird breeding and nesting season, then Project activities would be subject to potential exclusionary buffer(s) when and where active nests are discovered during the course of construction. If project activities occur within the migratory bird breeding season, then a qualified bird biologist would be required to be present to ensure neither bird breeding nor nesting is occurring. The construction period should last approximately 6 to 8 months.

NO-ACTION ALTERNATIVE

In conformance with NEPA and CEQ guidelines, this EA also evaluates the no-action alternative. Under the no-action alternative, the proposed reclaimed water line would not be constructed and SVGC would continue to use potable water for irrigation at a rate of about 450 million gallons per year for irrigation, as previously described. Current pumping levels would be maintained wherever feasible. No further wells would be drilled as part of this project, and no other sources of water would be sought as a result of this determination. No trenching, operation of heavy equipment, or land disturbance would take place, and the use of electricity to operate the SVGC and the CNLV-WRF would likely remain the same as it is at present.

During discussion of this project, it was stated that the failure of the wells providing water to SVGC may occur in the near future. Failure would take place due to the water table dropping below the level at which water could be extracted from the current wells. At the point where further extraction of groundwater from these wells becomes unfeasible, it would be determined whether the SVGC would continue to operate beyond then, or whether its capabilities would be reduced or decommissioned altogether. In the event that it is determined that new wells are necessary to maintain that level, a separate Environmental Assessment discussing that project would be commissioned.

The no-action alternative would continue to impact the water table, increase cost for irrigation of the SVGC, and would not allow the USAF with the goal to conserve environmental resources where possible.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Preferred Alternative presented in the EA concluded that by implementing standard environmental protection measures and operational planning, the Air Force would be in compliance with all terms and conditions and reporting requirements for implementation of the reasonable and prudent measures stipulated with the Nevada Historical Preservation Office, the City of North Las Vegas, and any other relevant agency.

The Air Force has concluded that no significant adverse effects would result to the following resources as a result of the Preferred Alternative: land use, air quality, cultural/archaeological resources, flora and fauna, wetlands, noise, appearance/aesthetics, environmental justice, and public safety. No significant adverse cumulative impacts would result from activities associated with Alternative 1 (Pipeline Route A) when considered with past, present, or reasonably foreseeable future projects.

This project may potentially have a negative impact on certain geological resources, water/hydrology, infrastructure, and hazardous waste, to be described in depth further later in the document.

Cultural Resources

Based on discussion with the base archaeologist, no cultural or archaeological resources are expected to be in the project area. A records/document search of the Nevada State Historical Preservation Office website – Nevada Cultural Resource Information System (NVCRIS) has been completed and no cultural or archaeological resources have been found near the project site. An archaeological field survey was conducted in those areas that had not been surveyed previously and no cultural resources were identified and that SHPO consultation and tribal consultation was initiated. As well as Tribal input at the NAFB tribal meeting 11 May 2017 in Beatty Nevada. The following report and note that it is (would be) on file with the Nevada SHPO. P 47 reference 2012 ICRMP for NAFB.

However, a plan is available in Appendix G for use in the event of an unanticipated discovery of such artifacts. In that event, work would be stopped until relevant authorities can confirm and classify the discovery. Also the Cultural Survey (records/document search) was completed for this project and is included in Appendix I.

Geological Resources

The primary potential impact to geological resources is the risk of erosion, and of contamination of soils due to soils being disturbed during construction activities. These risks can be minimized through proper erosion and spill control measures, and are unlikely to be beyond that expected in a project of this scale.

Water/Hydrology

In terms of water and hydrology, construction of the pipeline would allow for the use of reclaimed water in places where potable water was previously used, leading to increased availability of potable water to the Las Vegas Valley. However, reclaimed water contains increased levels of nitrates and phosphorus, which may negatively impact water quality downstream of the NAGC; this effect may be reduced by decreased use of fertilizer on the NAGC grounds to maintain the vegetation there.

Air Quality

In terms of air quality, construction of the pipeline would have minimal construction equipment during the excavation and backfilling of the trench. The *"Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2*", dated August 2016, was reviewed and a Level II, Air Quality Quantitative Assessment was performed. The results from the Air Conformity Applicability Model (ACAM) are included in Appendix C.

Hazardous Waste

The use of heavy machinery in construction of this project brings a risk of the release of hydrocarbons or other related fluids. This risk can be managed with proper techniques to operate and store heavy equipment, and the storage of fuels, maintenance-related substances, and other similar risks. Additionally, a risk of uncovering the landfill site designated LF-01, containing wastes from fueling areas and wastewater treatment, is a possibility, but due to the shallow depth of excavation, it is unlikely that this project would uncover debris from the landfill area of LF-01.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA, CEQ Regulations, and 32 CFR §989, I conclude neither the Preferred Alternative 1: Pipeline Route A, nor Alternative 3, Pipeline Route B, would not have a significant environmental impact, either by itself or cumulatively with other reasonably foreseeable projects. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant completes the environmental impact analysis process.

_____ _____

PAUL J. MURRAY
Colonel, USAF
Commander

Date

IN WITNESS WHEREOF, I have hereunto set my hand the 27th day of APRIL, 2018.

THE UNITED STATES OF AMERICA
by its Secretary of the Air Force

NOTARY, UNITED STATES AIR FORCE
10 U.S.C. 1044a
OFFICE OF JUDGE ADVOCATE

By: _____
PAUL J. MURRAY
Commander, 99th Air Base Wing
Nellis Air Force Base, Nevada

[CHECK STATE LAW REQUIREMENTS FOR ACKNOWLEDGING CONVEYANCE DOCUMENTS AND INCLUDE THE ACKNOWLEDGEMENT FORM BELOW THAT COMPLIES WITH STATE LAW REQUIREMENTS.]

State of NEVADA

ss

County of CLARK

This document was acknowledged before me, the undersigned Notary Public, by PAUL J. MURRAY on this the 27th day of APRIL, 2018

_____
Notary Public, State of NEVADA
JOSEPH R. AGUON, SGT, USAF
Paralegal
NOTARY BY FEDERAL STATUTE
10 U.S.C. §1044a

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AF	Air Force
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNLV	City of North Las Vegas
DOPAA	Description of the Proposed Action and Alternatives
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
MAJCOM	Major Command
MOA	Memorandum of Agreement
NAFB	Nellis Air Force Base
NEPA	National Environmental Policy Act
PREIAP	Planning Requirements for the Environmental Impact Analysis Process
ROD	Record of Decision
SHPO	State Historic Preservation Officer
SVGC	Sunset Vista Golf Course
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USFWS	United States Fish and Wildlife Service
WRF	Water Reclamation Facility

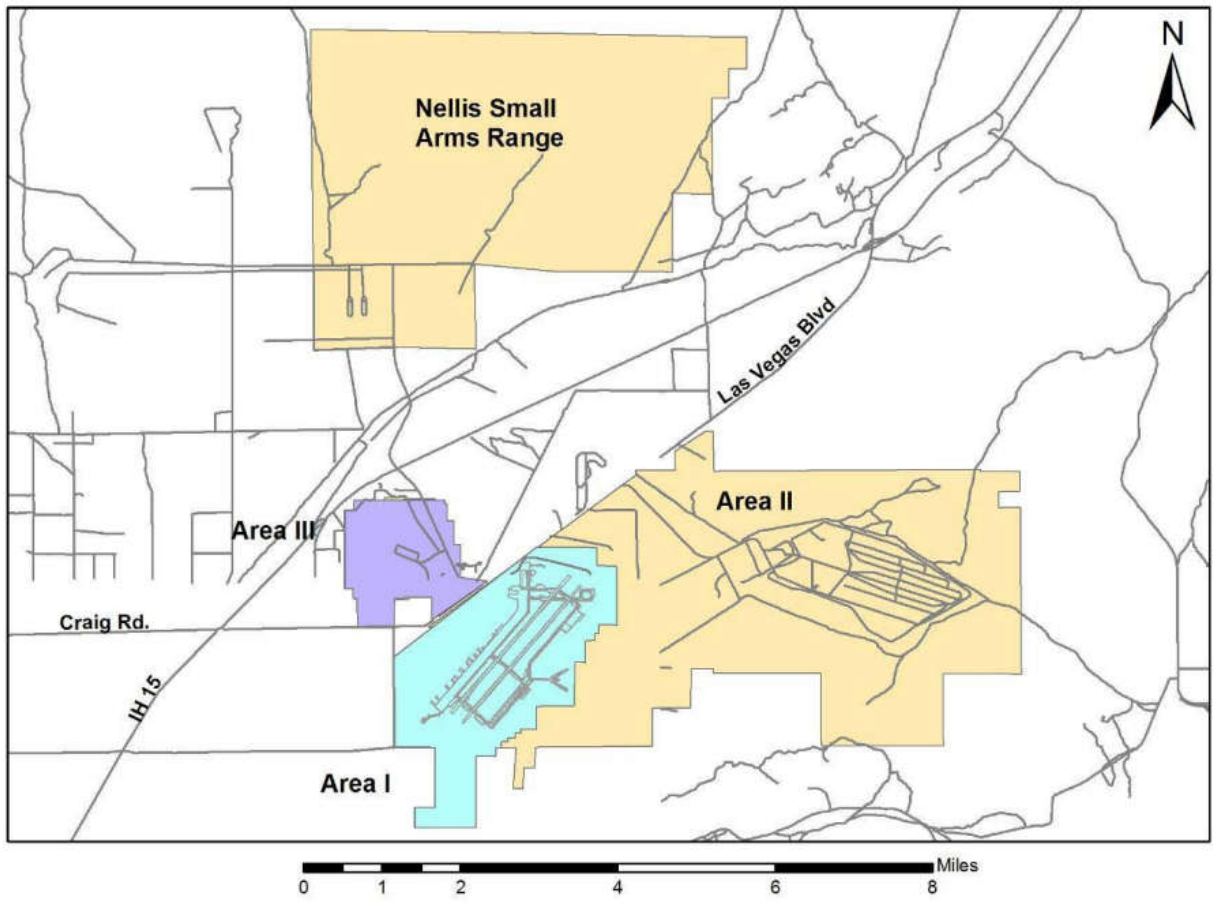
1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) analyzes the potential environmental consequences of the City of North Las Vegas (CNLV) proposal to install a reclaimed water line within an existing utility corridor that includes an electrical transmission line, between the Nellis Air Force Base (NAFB) golf course, known as Sunrise Vista Golf Course (SVGC) and the CNLV Water Reclamation Facility (WRF). The primary element of the reclaimed water line is the reduction in the use of potable water for irrigation purposes on the SVGC. This reduction of the withdrawal of aquifers in the Las Vegas Valley would be in accordance with the goal of the United States Air Force (USAF) to conserve environmental resources where possible. This EA was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969; Environmental Impact Analysis Process for the United States Air Force (32 Code of Federal Regulations [CFR] Part 989); and other applicable federal and state environmental legislation.

NAFB is located northeast of the City of North Las Vegas in Clark County, Nevada. It occupies approximately 14,163 acres adjacent to the metropolitan area. NAFB is divided into three (3) areas and this project is located in Area 1. Area 1 includes the NAFB facilities southeast of Las Vegas Boulevard. Aircraft facilities, administrative buildings, residential housing, recreation facilities, and personnel services are located here. See Figure 1.1 NAFB map.

Figure 1.1. NAFB Area Map



1.2 PURPOSE OF THE ACTION

The purpose of the proposed action is to provide a suitable alternative to potable water for the upkeep of the NAFB Golf Course. Currently SVGC relies on potable water pumped from three (3) wells for their irrigation needs. The existing wells are becoming dry and are no longer providing the SVGC with its current water demand for irrigation. SVGC has had to rely on potable water from the City of North Las Vegas for irrigation, which has become expensive.

The demand for potable water in the Las Vegas Valley is growing as the population of the area is steadily increasing, while the replenishment of present water supplies is limited by recent periods of drought in the region. According to contacts with its operators, SVGC consumes approximately 450 million gallons per year (1,703,435 m^3/year) for irrigation. According to industry sources, a typical golf course requires up to 1,000,000 gallons of water per week (3,785 m^3/week) during summer months to maintain a healthy vegetation, resulting in a potential high-end estimate annual consumption of 52,000,000 gallons of water per year (196,841 m^3/year). Therefore, SVGC consumes considerably more water than the national average for golf courses. This increased usage may be attributed to the dry weather conditions that predominate in the Las Vegas Valley. The procurement of this water represents a significant expense, and less costly options may exist, one of which is the use of reclaimed water in place of potable water.

1.3 NEED OF THE ACTION

The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between City of North Las Vegas (CNLV) and USAF, in which a reclaimed water line must be constructed to irrigate the SVGC (See Appendix L). As part of the EULA, NAFB has provided land for the construction of a treatment facility, identified in this document as the City of North Las Vegas Water Reclamation Facility (CNLV-WRF).

It is believed that, due to present conditions, the wells currently used to irrigate the SVGC may soon be at risk of failing. This is due to a general lowering of the water table, caused by the withdrawal of groundwater in the Las Vegas Valley at a rate greater than its replenishment. This continued decline in available groundwater could result in the wells being used in irrigation to become unusable when the water table is depressed beneath the ends of the wells. There is a need to acquire reclaimed water that would replace the use of potable in order to keep the golf course operational. Utilizing reclaimed water for uses in which potable water is not necessary, such as irrigation for landscaping, would reduce the rate of aquifer depletion in the Las Vegas area, and allow more potable water to be available for applications in which it is necessary.

1.4 DECISION TO BE MADE

The decision to be made is the selection of an alternative for providing reclaimed water to the NAGC, to support its continued operation. The decision options are:

1) To continue with current operations (the No Action Alternative);
2) Selecting an alternative and preparing a FONSI; or
3) Preparing an Environmental Impact Statement if the alternatives would result in significant environmental impacts.

1.5 COOPERATING AGENCY AND INTERGOVERNMENTAL COORDINATION/ CONSULTATIONS

1.5.1 Interagency and Intergovernmental Coordination and Consultations

Federal, state, and local agencies with jurisdiction that could be affected by the alternative proposed actions were notified and consulted during the development of this EA.

Appendix A contains the list of agencies consulted during this analysis and copies of correspondence.

1.5.2 Government to Government Consultations

EO 13175, Consultation and Coordination with Indian Tribal Governments (6 November 2000), directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. To comply with legal mandates, federally recognized tribes that are affiliated historically with the Nellis AFB geographic region will be invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal coordination process is distinct from NEPA consultation or the IICEP processes and requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Nellis AFB point-of-contact for Native American tribes is the Installation Commander. The Nellis AFB point-of-contact for consultation with the Tribal Historic Preservation Officer (THPO) and the Advisory Council on Historic Preservation is the Cultural Resources Manager.

The Native American tribal governments that will be coordinated with regarding this proposed action are listed in Appendix A.

1.6 PUBLIC AND AGENCY REVIEW OF EA

A Notice of Availability (NOA) of the Draft EA and FONSI published in the newspapers of record (listed below), announcing the availability of the EA for review on November 12, 2017. The NOA invited the public to review and comment on the Draft EA. The public and agency review period ended on December 12, 2017. Public and agency comments are provided in Appendix A.

The NOA was published in the following newspapers: Las Vegas Review-Journal, El Tiempo.

Copies of the Draft EA and FONSI were also made available for review at the following locations:

Las Vegas Library Reference Department 833 Las Vegas Blvd. North Las Vegas, NV 89101	Nevada State Clearinghouse Division of State Lands Carson City, NV 89701

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the CNLV proposal to construct a reclaimed water line to supply the SVGC with an alternative source of irrigation water. In conformance with NEPA and Council on Environmental Quality (CEQ) guidelines, this chapter also describes the no-action alternative.

2.1 PROPOSED ACTION

The City of North Las Vegas proposes to construct and maintain approximately 12,100 linear feet of 10-inch diameter PVC reclaimed water main at one of two locations. The three sites being considered are shown on Figure 1. This reclaimed water main would be connected to the existing pump station at CNLV-WRF, and would supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. Raptor Pond is located to the northwest of the SVGC clubhouse, and Eagle Pond is located to the northeast of the clubhouse.

In order to construct the reclaimed water line, excavation and backfilling of earth between the CNLV-WRF and SVGC would be required. This excavation would be in the form of a trench, approximately two (2) feet wide, by five (5) feet deep, by 12,100 feet long. Based on these dimensions, between 4,400 and 5,000 cubic yards (yd^3) of earth would be removed, depending on which route is selected. The trench would be built from CNLV-WRF to SVGC, with a branch to each pond. After construction and installation of the pipeline, the trench would be backfilled with excavated material and the disturbed vegetation returned to its existing condition or better. The construction of this pipeline would most likely utilize various motorized construction equipment such as water trucks, dump trucks, excavators, cement and mortar mixers, tractors, backhoes, front-end loaders, fork lifts, and generator sets. This equipment would be used to excavate the trench for the pipeline alignment, install the pipe and conduit, backfill the trench, and repair/replace concrete or asphalt cart paths and roadways. The haul routes for the materials and construction workers would be through the gate located off Nellis Boulevard and E. Gowan Road. They would travel east from the gate to Kinley Drive, then south along Kinley Drive to the SVGC entrance. This would eliminate additional traffic through the Main Gate off Craig Road and through the base. The construction workers would be around a 6 or 8 man crew at any one time.

In either alignment, the pipeline would utilize a cut and excavate method for crossing of the Sloan Channel. This crossing would be fully encased with a minimum depth of 3.5 feet from the bottom of the channel, as suggested by Clark County Public Works standards. In the unlined channels at each pond, the water line would be constructed below the scouring depth and would be placed in a concrete encasement to mitigate the issue of erosional scour caused by flowing water.

Construction of the pipeline shall be timed to avoid the migratory bird breeding and nesting season (September 1 to February 28), or as much of the season as feasible. Should project planning and scheduling cause all or any portion of the Project to be constructed during the migratory bird breeding and nesting season, then Project activities would be subject to potential exclusionary buffer(s) which can only be utilized after consultation with US Fish and Wildlife Service and receiving their approval for this option The construction period should last approximately 6 to 8 months.

Construction Timeline:

Permitting and Material Ordering	March through May - 3 months
Begin Construction from WRF to SVGC Clubhouse	June - 1 month
Construction from SVGC Clubhouse to Eagle Pond	July - 1 month
Construction from SVGC to Raptor Pond	August to September - 2 months
Project Close out	October - 1 month

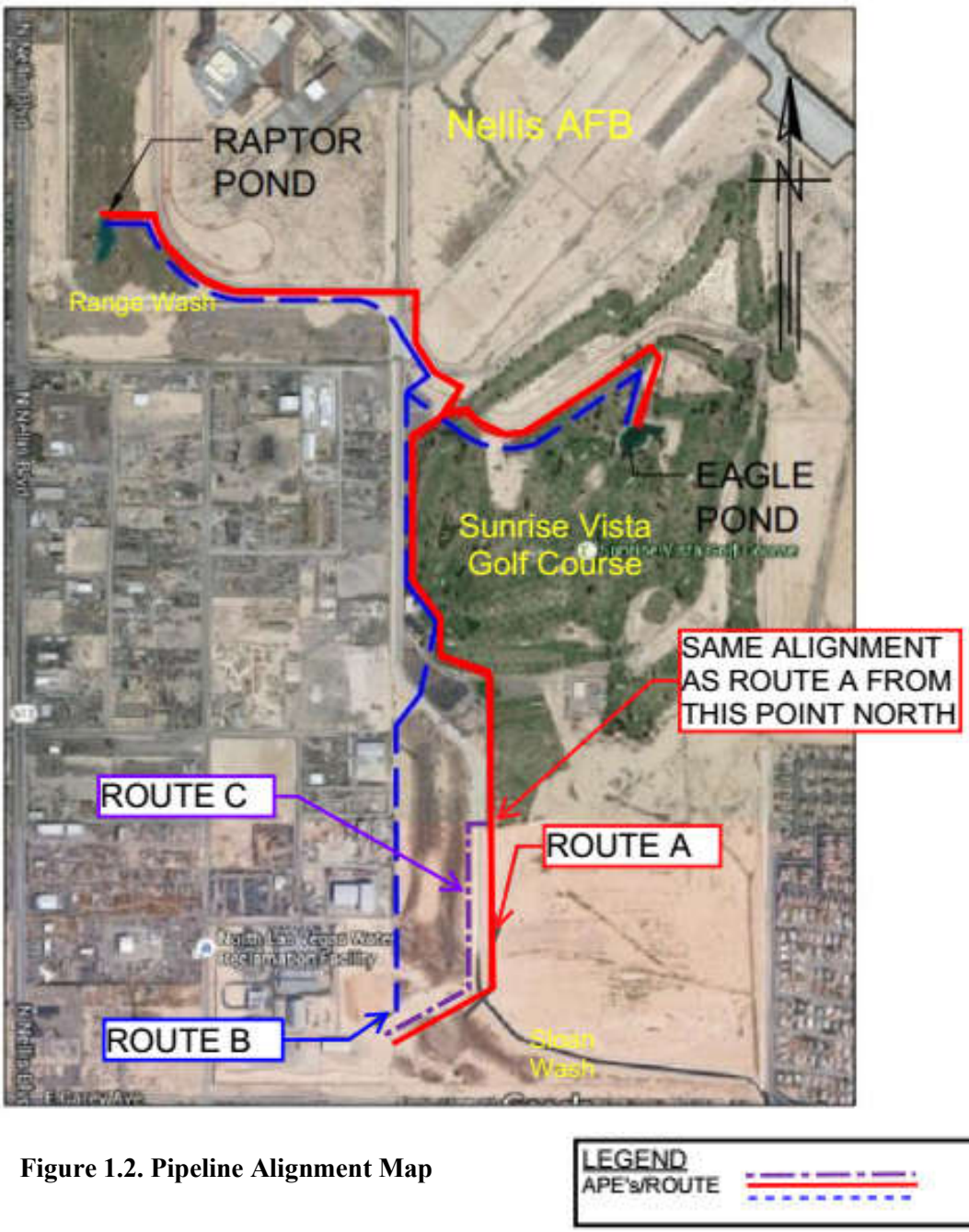


Figure 1.2. Pipeline Alignment Map

2.2 SELECTION STANDARDS

The NEPA and the CEQ regulations mandate the consideration of reasonable alternatives for the proposed action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the proposed action. Per the requirements of 32 CFR §989, the USAF Environmental Impact Analysis Process (EIAP) regulations, selection standards are used to identify alternatives for meeting the purpose and need for the USAF proposed action.

The proposed action alternatives must meet the following selection standard:

1) The amount of potable water consumed by the NAGC must be reduced, whether or not it is replaced by water from another source.
2) Any construction must disturb as little ground as possible, and must limit any conflicts with pre-existing buried features such as utilities or landfill sites.
3) Any further impacts to the environment, such as air emissions, degradation of wildlife habitat, or use of nonrenewable resources, should be minimized.

2.3 SCREENING OF ALTERNATIVES

The following potential alternatives that might meet the purpose and need for the construction of the reclaimed water pipeline were considered:

1) Alternative 1 – The pipeline is constructed according to Route A, as laid out on Figure 1.
2) Alternative 2 – The pipeline is constructed according to Route B, as laid out on Figure 1.
3) Alternative 3 – The pipeline is constructed according to Route C, as laid out on Figure 1.

Alternative Descriptions	Reducing potable water usage	Minimizing disturbed ground and utility conflicts	Minimizing environmental impacts
	(1)	(2)	(3)
Alternative 1 – Pipeline Route A	Yes	Yes	Yes
Alternative 2 – Pipeline Route B	Yes	No	No
Alternative 3 – Pipeline Route C	Yes	Yes	No
No-Action Alternative	No	Yes	Yes

The selection standards described in Section 2.2 were applied to these alternatives to determine which alternative(s) could be used to provide reclaimed water to the grounds of Nellis AFB, and would fulfill the purpose and need for the proposed action.

2.4 DETAILED DESCRIPTION OF THE ALTERNATIVE(S)

Four alternatives, Alternative 1 (Preferred Alternative), Alternative 2, Alternative 3, and "No-Action" are analyzed in the detailed description of the alternatives.

2.4.1 Alternative 1 – Pipeline Route A

In Figure 1, the Proposed Action is represented by Route A. This route is the alignment preferred by CNLV for the reclaimed water line. The alignment starts from the northeast corner of CNLV-WRF, and runs east. The alignment then crosses the Sloan Channel and runs north east of the Sloan Channel through the SVGC driving range, past the clubhouse and to each pond.

In comparison to Route B, Route A would reduce the amount of disturbed land created as part of the project, as this route runs parallel to the Nevada Energy feeder line that currently exists east of the Sloan Channel. This feeder line is used for electricity transmission from a solar photovoltaic system to substations, both of which are on NAFB property. Operating within this corridor would limit potential unforeseen conflicts with other existing buried utilities which may arise from using a different route. This alternative would disturb the least amount of area, limit unknown utility conflicts, and disruption to the SVGC.

2.4.2 Alternative 2 – Pipeline Route B

In Figure 1, Alternative 2 is represented by Route B. This alignment was proposed by Greeley and Hansen, the engineering firm consulting on pipeline design and construction. The alignment starts at the northeast corner of the CNLV-WRF, and runs to the north along the west side of the existing Sloan Channel. The alignment crosses the Sloan Channel and continues north to the SVGC grounds. The pipeline to Raptor Pond would continue to the west side of the Sloan Channel, and the pipeline to Eagle Pond would cross the Sloan-Range Wash near the confluence of the two washes at the fairway crossing. It would then remain on the south side of Range Wash, heading east, then south, between the existing tee and green to Eagle Pond.

Route B follows the same path as a conduit alignment alternative that was considered, but not used, for the utility conduit used in Phase II of the solar photovoltaic power station at the south end of the Nellis AFB property. This alignment would be within an area that has been previously disturbed, but may have additional unknown subsurface utility conflicts which could increase the cost and duration of construction.

2.4.3 Alternative 3 – Pipeline Route C

This alignment was proposed by the USAF, a Boring Contractor and Greeley and Hansen on a field visit to the site to evaluate the crossing of Sloan Channel. The alignment starts at the northeast corner of the CNLV-WRF, and runs to the north along the west side of the existing Sloan Channel. The alignment crosses the Sloan Channel and continues north in the same alignment as Route A.

2.4.4 No-Action Alternative

As required by NEPA and applicable regulations, an alternative to the Proposed Action for the USAF would be the No Action Alternative. Under the no-action alternative, the proposed reclaimed water line would not be constructed and SVGC would continue to use potable water for irrigation at a rate of about 450 million gallons per year for irrigation, as previously described. Current pumping levels would be maintained wherever feasible. No further wells would be drilled as part of this project, and no other sources of water would be sought as a result of this determination. No trenching, operation of heavy equipment, or land disturbance would take place, and the use of electricity to operate the SVGC and the CNLV-WRF would likely remain the same as it is at present.

During discussion of this project, it was stated that the failure of the wells providing water to SVGC may occur in the near future. Failure would take place due to the water table dropping below the level at which water could be extracted from the current wells. At the point where further extraction of groundwater from these wells becomes unfeasible, it would be determined whether the SVGC would continue to operate beyond then, or whether its capabilities would be reduced or decommissioned altogether. In the event that it is determined that new wells are necessary to maintain that level, a separate Environmental Assessment discussing that project would be commissioned.

The no-action alternative would continue to impact the water table, increase cost for irrigation of the SVGC, and would not allow the USAF with the goal to conserve environmental resources where possible.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Additional Drilling and Permitting of Groundwater Wells

In the process of determining alternatives, it was proposed that additional wells could be drilled to provide water for SVGC, similar to the wells that are currently in place. However, this would result in increased impact on the local aquifer, due to the amount of water required to be drawn for irrigation. Based on the selection criteria for alternatives, while this may be more cost-effective in the near term, it is believed that cost of operation and maintenance would exceed any savings. In addition, the environmental impacts of this alternative would exceed any benefits received from the improved operation of SVGC.

This alternative is not carried forward for analysis in this EA as it would not meet the purpose and need or the selection standards one, two, and three.

3.0 AFFECTED ENVIRONMENT

The Region of Influence (ROI) for the Proposed Action is the Las Vegas Valley, unless otherwise specified below for a particular resource area where a resource would have a different ROI.

3.1 SCOPE OF THE ANALYSIS

This chapter describes the current conditions of the environmental resources, either man-made or natural, that would be affected by implementing the Preferred Alternative, Alternative 2, Alternative 3, or the No Action Alternative. Based on the scope of the Proposed Action, issues with minimal or no impacts were identified through a preliminary screening process. The following describes those resource areas not carried forward for a detailed analysis, along with the rationale for their elimination.

Regardless of the alternative selected, the following resources would not be affected by the Proposed Action and are not discussed in detail in this EA:

- ***Cultural and Archaeological Resources:*** Based on discussions with the base archaeologist, no cultural or archaeological resources are expected to be in the project area. A search of the Nevada State Historical Preservation Office website – Nevada Cultural Resource Information System (NVCRIS) has been completed and no cultural or archaeological resources have been found near the project site. An overlay of the NVCRIS data has been prepared and included as Figure 1, Appendix I. However, a plan is available in Appendix G for use in the event of an unanticipated discovery of such artifacts. In that event, work would be stopped until relevant authorities can confirm and classify the discovery. An archaeological survey was conducted in those areas that had not been surveyed, no cultural resources were identified and where SHPO consultation and tribal consultation were initiated. This included Tribal input at the NAFB tribal meeting 11 May 2017 in Beatty Nevada. See report and note that it is (would be) on file with the Nevada SHPO. P 47 reference 2012 ICRMP for NAFB.

  No cultural or archeological resources were located on the proposed project site and State Historic Preservation Officer concurrence was received (Nellis 2006). A list of all of the Tribes that have been invited for Government to Government Consultation is included in Appendix A along with any comments that have been received.

- ***Wetlands or Jurisdictional Waters of the US:*** No wetland areas are in the project area, and the construction of either Alternative 1, 2, or 3 would be unlikely to cause impact on wetlands down-gradient of the construction area. Per the Nellis AFB "Integrated Natural Resource Management Plan" there are no wetlands or jurisdiction waters found on NAFB. Ponds have been established on the SVGC but are no jurisdictional water because they are isolated and supplied by artificial sources of hydrology. Thus, the Proposed Action is not expected to impact any wetlands or jurisdictional waters in the ROI.

- ***Floodplains:*** Impacts to the floodplains from either Alternatives 1, 2, or 3 would not be effected as the construction is located outside of the 100-year floodplain of the Sloan Channel. The channel was constructed to contain the 500-year storm event. Thus, the Proposed Action is not expected to result in a significant impact to the floodplains in the ROI.

- ***Environmental Justice*****:** Environmental Justice and the Protection of Children: While the area southwest of Nellis AFB, known as Sunrise Manor, is considered to have lower

average incomes and a higher proportion of minority populations than Clark County and Nevada at large, it is unlikely that those populations would be disproportionately impacted by the Proposed Action, as the impacts would be limited to the vicinity of the construction area. Although Martin Luther King Jr. Elementary school is nearby, it is located over .25 miles away and is not expected to be significantly impacted by the construction activities. Standard construction practices would be implemented to minimize dust generated and these effects would be short-term and temporary. Noise associated with construction is not expected to significantly impact the surrounding residents or the elementary school. Although traffic will increase due to construction activities in Sunrise Manor and areas directly south of the base, these increases are expected to be short term and minor. Care will be taken to avoid disrupting any utility lines during excavation that could potentially impact adjacent communities.

- ***Public Safety:*** The construction of Alternatives 1, 2 or 3 would be unlikely to cause a reduction in public safety. The project area is not particularly attractive to children, and it is highly unlikely that this project would have the potential to negatively impact the security of Nellis AFB, whether through allowing or attracting unauthorized persons to get through to the project area. Likewise, it is unlikely that the pipeline would be a target for terrorism or sabotage.
- ***Aesthetics:*** In the event that either Alternative 1, 2 or 3 was selected, construction would occur, resulting in a minor, temporary decrease in the aesthetics and visual quality of the area. However, the end result would be a visual quality relatively indistinguishable from its current appearance, so no major impacts are expected to extend beyond construction.
- ***Geology:*** Due to the shallow depth of the project, it is unlikely that this would have any impact on the local bedrock, or cause disturbances in local seismicity. However, the project may have an impact on local soils, which is discussed in greater detail in Section 4.8 of this document.
- ***Topography:*** Impacts in which topography is modified would be temporary and limited to any excavation or stockpiling of soil, and would be removed after construction is over. Therefore, it is unlikely that these Alternatives would have a significant effect on local topography.
- ***Socioeconomics:*** Impacts created by construction activities considered under each alternative will be completed through the use of the local workforce. No new personnel will be located to the base as a result of the Proposed Action. Positive impacts to the local economy are expected to be less than significant. Thus, the Proposed Action is not expected to result in a significant impact to the socioeconomic conditions in the ROI.

3.2 NOISE

Definition of Resource:

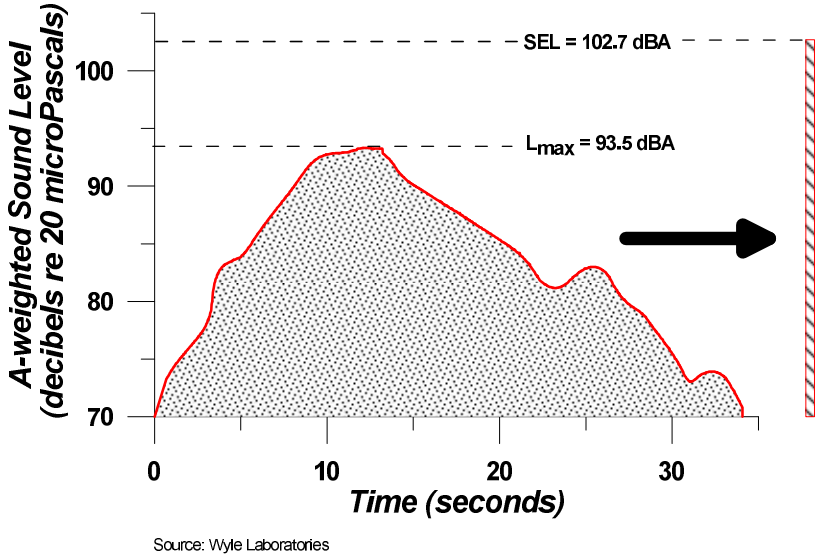
Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (such as hearing loss or damage to structures) or subjective judgments (community annoyance). The response of different individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise

occurs, and the sensitivity of the individual. Noise also may affect wildlife through disruption of nesting, foraging, migration, and other life-cycle activities. Sound is expressed in the logarithmic unit of the decibel (dB). A sound level of 0 dB approximates the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 to 140 dB are felt as pain (Berglund and Lindvall 1995). The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB.

All sounds have a spectral content, which means their magnitude or level varies with frequency, where frequency is measured in cycles per second, or Hertz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements usually employ an "A-weighted" scale that de-emphasizes very low and very high frequencies to replicate the reduced human sensitivity to those frequencies. It is common to add the "A" to the measurement unit to identify that the measurement was made with this filtering process, for instance dBA. In accordance with DoD guidelines and standard practice for environmental impact analysis documents, this report utilizes A-weighted sound levels denoted as "dB" unless specified differently.

Noise Metrics: Maximum Sound Level (Lmax) and Sound Exposure Levels (SEL)

Noise events are considered to start when noise levels begin to increase beyond ambient or background levels. Typically, noise generated from construction equip remains fairly constant during operation but could vary over time. An example of the variation in sound level with time is shown by the solid line in Figure 3.1. The Maximum Sound Level (Lmax) is the instantaneous maximum sound level measured/heard during the event. The Lmax is important in judging the interference caused by a noise event with conversation, television or radio listening, sleep, or other common activities. Although it provides some measure of the intrusiveness of the event, it does not completely describe the total event, because it does not include the duration of time that the sound is heard.



Source: Wyle Laboratories

Figure 3.1 Maximum Sound Level (Lmax) and Sound Exposure Levels (SEL) Comparison.

As a composite metric, SEL represents all of the sound energy of the single event and includes both the intensity of a sound and its duration. The SEL metric is the best metric to compare noise levels from sources that vary overtime, such as aircraft overflights.

Affected Environment:

Construction required to implement the Proposed Action would be contained within the boundaries of Nellis AFB. The existing noise environment is dominated by aircraft ground and flight activity. Surface roadway or construction traffic noise does not contributed significantly.

3.3 AIR QUALITY

The Clean Air Act (42 U.S.C. 7401- 7671q), as amended, assigns EPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQSs) (40 CFR Part 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as both particulate matter less than 10 microns in diameter [PM10] and particulate matter less than 2.5 microns in diameter [PM2.5]), sulfur dioxide (SO2), carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), and lead (Pb).

Additionally, depending upon the severity of criteria pollutant air concentrations, the EPA may designate an area as “nonattainment”. If this occurs, the state in which the nonattainment area presides must develop a State Implementation Plan (SIP) which outlines to steps the state will take to meet the NAAQSs. Nonattainment areas that achieve attainment with the NAAQSs and re-designated attainment by the EPA are considered “maintenance areas” for a probationary period of twenty years. States must develop maintenance plans (or maintenance SIPs) for maintenance areas ensure continued compliance with the NAAQSs to for two ten-year probationary periods.

If an area is designated as nonattainment or maintenance for any of the criteria pollutants, General Conformity (40 CFR 93 subpart B) may apply. The purpose of General Conformity is to ensure that any federal action does not interfere with any applicable SIP. General Conformity requires federal government agencies to prepare written conformity assessment for federal actions located in or affecting NAAQS nonattainment areas or maintenance areas (Note: A separate assessment must be performed for each affected area). An assessment begins with an Applicability Analysis which includes screening for exemptions or presume to conform actions and, if needed, an estimate of net change on air emissions that would be generated by the Proposed Action compared against the de minimis threshold levels defined in the rule. If the emission levels are below the threshold levels, a Record of Non-Applicability (RONA) is prepared. If the emission levels are above the threshold levels, an in-depth Conformity Determination is required. In the case of this project, a RONA has been prepared because the air emissions are below the threshold levels defined by the rule.

Nellis AFB is located within Clark County which has two air quality regulatory areas: the Clark County Regulatory Area and the Las Vegas Area. Approximately 80% of Nellis AFB falls with the Clark County Regulatory Area which is am designated as a maintenance (serious classification) are for particulate matter less than 10 microns in diameter (PM10). Additionally, approximately 80% of Nellis AFB falls with the Las Vegas Regulatory Area which is am designated

as maintenance (serious classification) are for carbon monoxide (CO). Therefore, a General Conformity assessment must be performed for each alternative.

Generally, a Net Change Emissions Assessment is required to quantify the emissions of criteria pollutant and to evaluate if a proposed action poses a significant impact to air quality. A Net Change Emissions Assessment compares all net (increases and decreases) of direct (caused by the action and occur at the same time & location of the action) and indirect (caused by the action but occur at a different time or location than the action) emissions against significance indicators. For proposed actions occurring within nonattainment/maintenance areas, the General Conformity de minimis values (40 CFR 93.153) are used as General Conformity Determination thresholds (if exceeded a General Conformity Determination is required). For proposed actions occurring within an area that is in attainment with all NAAQSs, the General Conformity de minimis values (40 CFR 93.153) are used as indicators of potential significance.

The air quality impact assessment was conducted in accordance with the guidance in the "Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2", dated August 2016 band 32 CFR Part 989. Based the USAF guidance, a Net Change Emissions Assessment was performed using the Air Conformity Applicability Model (ACAM) that proved both a NEPA and a General Conformity Applicability Analysis.

3.4 WATER RESOURCES

Area 1 of NAFB is an urban environment which contains aircraft facilities, including runways, residences, offices, and recreational facilities.

3.4.1 Surface Waters

NAFB is located in the Las Vegas Valley which everything drains through the Las Vegas Wash and into Lake Mead. There are no natural perennial or intermittent streams, lakes or springs found on NAFB as a result of the low precipitation, high evaporation and low humidity. All ponds are man-made and are located on the SVGC. The area contains some ephemeral streams and/or washes that ultimately flow to the Las Vegas Wash. Storm water from the base generally flows to Clark County Regional Flood Control District channels which route the flow to the Wash. Because Las Vegas Wash is connected to the Colorado River, any ephemeral streams and washes that empty into the Las Vegas Wash could potentially be considered jurisdictional under Section 404 of the Clean Water Act. Therefore, any placement of fill into the Sloan Channel would require coordination with USACE.

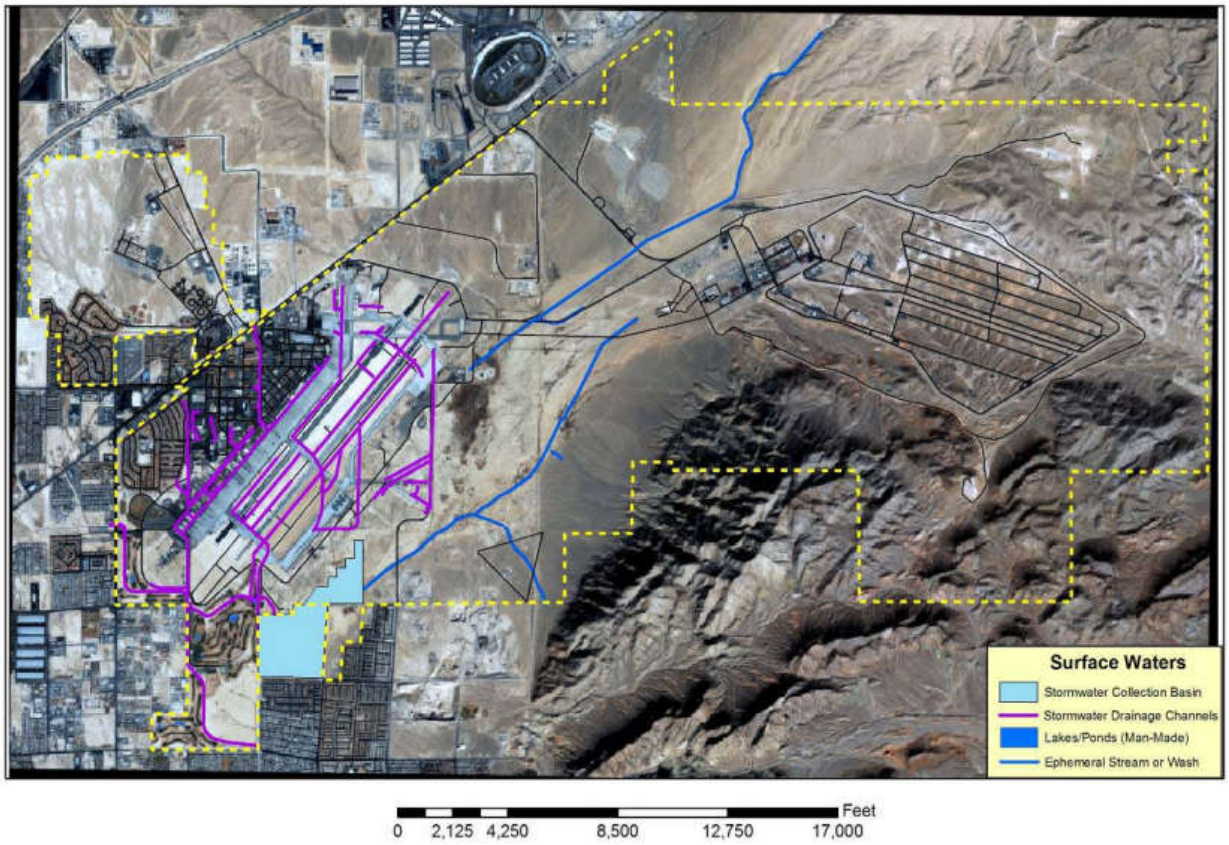


Figure 3.2 Nellis Surface Water Map

3.4.2 Groundwater

NAFB is located on the eastern side of the Las Vegas Valley, the groundwater flow in the valley generally flows from the west to the east. The Las Vegas Valley is filled with a considerable volume of alluvial sediments. This sediment volume and thickness has allowed a substantial groundwater aquifer to accumulate, which has historically provided a significant portion of the water supply for the City of Las Vegas. Currently groundwater accounts of approximately 29% of the water supply for NAFB (Nellis 2007a).

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

Monitoring wells were installed for the NVE Solar Array which indicated that the water table was approximately 50 feet bgs in a shallow aquifer. Water collected from the wells confirmed that the groundwater in the shallow aquifer under the solar array was not contaminated by leachate from the landfill.

3.5 SAFETY AND OCCUPATIONAL HEALTH

With regards to safety, the primary impacts would be related to construction of the pipeline, equipment operation, and movement of materials, as well as limiting exposure to hazardous materials.

3.6 HAZARDOUS MATERIALS / WASTE

Impacts due to hazardous materials would be focused on the land in the vicinity of the construction area, primarily on anything that could be remobilized or discovered in the process of construction. Pathways for contamination, including that generated by the operation of vehicles, would be studied and mitigated where possible.

3.7 BIOLOGICAL / NATURAL RESOURCES

A Biological Evaluation was prepared for this project to support the analysis of potential environmental impacts of the Proposed Action and has been included in Appendix H.

3.7.1 Vegetation

Historically, the Proposed Action would be located in Mojave Desert scrub. However, the Proposed Action is located in a developed or previously disturbed urban and industrial environment. The project would cross an abandoned golf course, runs adjacent to the Sloan Channel, and then crosses an active golf course. The area along the Sloan Channel mostly disturbed ground and very little vegetation. The three types of annual invasive are tumbleweed or Russian thistle, red brome, and cheat-grass. Red brome is desert-adapted and has become common on NAFB. Russian thistle, red brome, and cheat-grass are aggressive colonizers on disturbed soils, and they have replaced native annual populations in some areas. NAFB has a pest management program which controls and manages of these invasive plants.

The area that would be located within the SVGC consists of turf grass, fir trees, deciduous trees and areas of sparse or no vegetation. The SVGC grounds are maintained by the staff and is continually changing depending on the time of year and the need of the golf course.

Figure 3.3 Proposed Action Location Adjacent to Sloan Channel

Figure 3.4 Proposed Action Location Looking at Eagle Pond

3.7.2 Wildlife

NAFB is located adjacent to the growing metropolitan Las Vegas area and is generally an urban environment with some adjacent unimproved land. Any wildlife species present on base are likely present because their habitats allow them to adapt to an urbanized landscape (Nellis INRMP). The area is home to several bird species such as mourning dove, great-tailed grackle, killdeer, lesser nighthawk, and western burrowing owl. Possible reptiles that are known to be found occasionally are the desert tortoise, banded Gila monster, various lizards. Common snakes include the coach whip, gopher snake and the Mojave rattlesnake.

3.7.3 Special Status Species

Special status species include those species listed as endangered, threatened, candidate, or proposed under the Endangered Species Act (ESA) of 1973 (50 CFR Part 402), Birds of Conservation Concern (BCC) protected under the Migratory Bird and treaty Act (MBTA), and species protected by the state of Nevada.

A Biological Evaluation was prepared in March 2017 to support the analysis of the potential environmental impacts associated with the proposed action (Appendix H). Species in the Project Area listed as endangered or threatened under the ESA, and BCC protected under the MBTA, were identified using the USFWS Information, Planning, and Conservation System (IPaC) database (http://ecos.fws.gov/ipac/). Species protected by the state of Nevada were identified from the Nevada Natural Heritage Program website. The potential for occurrence in the Project Area was based on exiting information on the species distribution, and qualitative comparisons of the habitat requirements of each species to vegetation communities or landscape features of the project area. Table 1 lists all special status species evaluated, provides background information on each species, and notes whether a species may occur in the Project Area.

The desert tortoise (*Gopherus agassizii*) is known to occur on Area II of NAFB but has not been documented in Area I nor is there a pathway for the species from Area II to Area I.

A qualified biologist conducted a pedestrian biological reconnaissance survey of the Project Area on March 21, 2017 (EPG, 2017). No species-specific, protocol-level surveys were identified as necessary, as no potential habitat for ESA-listed species was found during the preliminary evaluation of the Project Area and IPaC query results. No ESA listed species were identified during the survey. The Western Burrowing Owl, a BCC, was documented during the field survey of the Project Area. Figure 1 identifies previous, occupied, and unoccupied burrowing owl burrows in the Project Area.

Figure 3.5 Existing Burrowing Owl Burrows along Sloan Channel

3.8 EARTH RESOURCES

A field exploration and laboratory testing was conducted by a qualified geologist on June 2nd and June 3rd, 2016 (GES, 2016) which has been included in Appendix B. Subsurface conditions were evaluated to depths of approximately 10 and 25 feet bgs, see Figure A-2 for soil boring locations. Fill was encountered which consisted primarily of moist, brown, medium dense to dense clayey sand up to one foot thick. The native soils that were encountered consisted mainly of layers of grained soils composed of dry to moist sandy lean clays with varying amounts of gravel. The Proposed Action would encompass approximately 1.2 acres which does not contain any soils that are considered Prime or Unique Farmland.

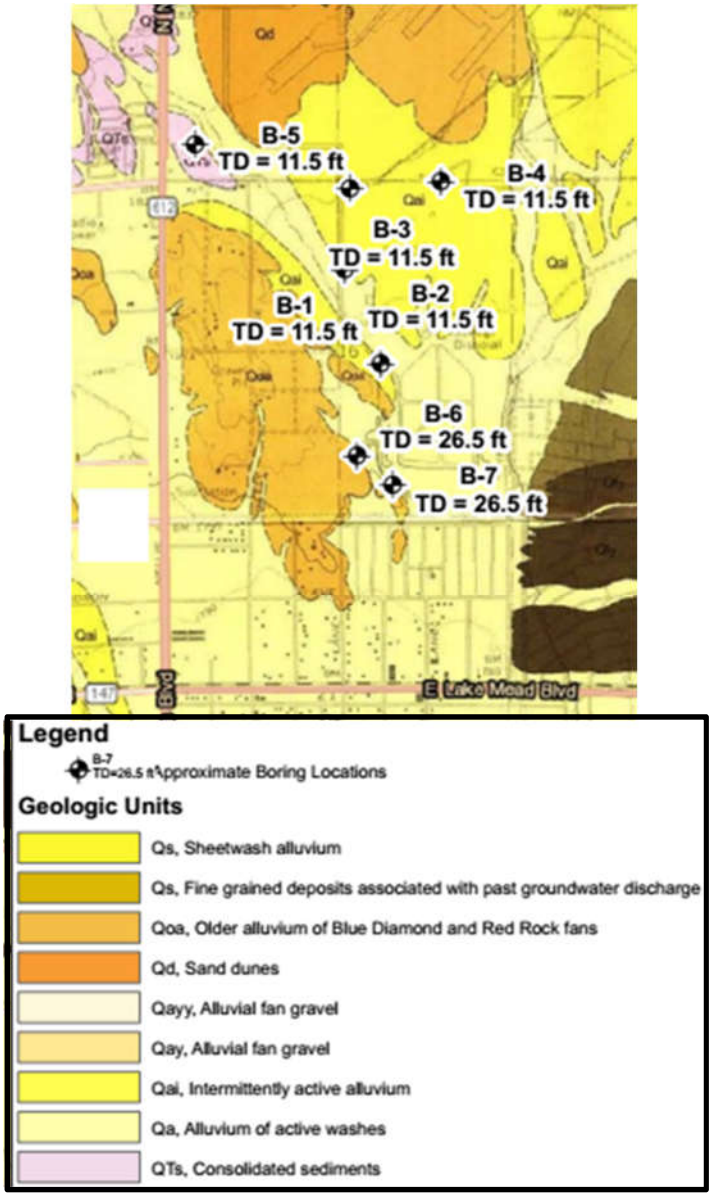


Figure 3.5 Mapped Geologic Units

3.9 INFRASTRUCTURE

The proposed Alternatives, due to being constructed underground, have the potential to impact previously constructed buried utilities. An analysis of their impact would require these utilities to be mapped and potentially avoided. Furthermore, any extra draws on the local electrical grid should be analyzed, as the upgrades at CNLV-WRF could have the potential to increase electrical demand. Additionally, increased vehicle traffic, and delays or road closures caused by the movement of construction equipment and material, should be considered in the vicinity of the project site and on Nellis AFB property. Benefits or negative impacts of the change from potable water to reclaimed water should be considered, where they concern on increased availability of either type of water.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the potential environmental consequences that are likely to occur as a result of implementation of all Alternatives that are being considered and analyzed. Impacts described in this chapter are evaluated in terms of type (positive/beneficial or adverse), context (setting or location), intensity (none, negligible, minor, moderate, severe), and duration (short-term/temporary or long-term/permanent). The type, context, and intensity of an impact on a resource are explained under each resource area. Unless otherwise noted, short-term impacts are those that would result from the activities associated with a project's construction and/or demolition phase, and that would end upon the completion of those phases. Long-term impacts are generally those resulting from the operation of a proposed project.

4.2 NOISE

The analysis of noise impacts is based on the routes of each alternative's pipeline and the noise levels produced by the various types of equipment used for the proposed construction activities.

In order to predict noise levels at various distances away from the construction sites, the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) will be used. Despite its name, this software program can be used viably for modeling the noise caused by operation of heavy construction equipment at most types of construction sites.

Alternative 1 (Preferred Alternative). None of the construction proposed in Alternative 1 is likely to be of a scale or nature that could interfere with the mission or operations of Nellis AFB. Once construction is complete, the footprint of the construction area is likely to be even or nearly even with the current ground surface, and no significant structures are expected to be added to the area.

Common construction equipment will be used in the construction of the pipeline. The noise generated by this equipment will be different from the noise made by typical airplane activity at Nellis AFB. Aircraft noise is loud and intermittent, whereas noise made by construction equipment is quieter but more consistent. Sensitive noise receptors may find the more persistent construction noise to be an annoyance, despite being exposed to louder but less consistent noise produced by aircraft operating out of Nellis AFB.

Using FHWA's RCNM, a model of the noise expected to be generated at the site was produced. Assuming a worst-case noise emissions scenario (i.e., pneumatic tools with an 85 dBA sound level at a distance of 50 feet), the noise model projected that noise levels of 85 dBA from a point source would attenuate to 75 dBA at 160 feet from the source, and to 65 dBA at 610 feet. A full accounting of sound attenuation with distance, calculated at distances with various construction equipment, is available in Table 4.1.

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

Noise Level	Actual L_{max}	100 feet	200 feet	500 feet	1000 feet
Dump truck	**76.5**	**70.4**	64.4	55.5	50.4
Excavator	**80.7**	**73.7**	**68.7**	60.7	54.7
Front end loader	**79.1**	**73.1**	**67.1**	59.1	53.1
Concrete mixer truck	**78.8**	**72.8**	**66.8**	58.8	52.8
Pneumatic tools	**85.2**	**79.2**	**73.1**	**65.2**	59.2
Backhoe	**77.6**	**71.5**	**65.5**	57.6	51.5
Generator	**80.6**	**74.6**	**68.6**	60.6	54.6

Source: Federal Highway Administration (FHWA) 2007, RCNM and GSRC. Values in bold exceed acceptable noise levels for local populations (65 dBA).
1. The 100 to 1000 foot results are RCNM modeled estimates based on recorded measurements of noise.

The construction noise was modeled, and the 65 dBA and 75 dBA noise contours were overlaid over a map of the proposed project area and adjacent neighborhoods. Road access to the construction site is on E. Carey Avenue, adjacent to the project site. According to the pathways of both pipeline routes under consideration, no noise sensitive receptors such as residential homes or parks are expected to be exposed to noise levels greater than 65 dBA by construction work on either pipeline.

However, several businesses operate along the western edge of the project area. Depending on the pipeline route chosen, some will be within 160 feet of the construction area, meaning that they could potentially be exposed to noise greater than the 75 dBA threshold, and further businesses could be exposed to noise greater than 65 dBA. Many of these businesses are automotive junkyards, meaning that they could also be generating their own high levels of noise based on their operations. These businesses will be notified of the project specifically, and such notification will include this assessment. Figure 3 depicts the area affected by construction noise from the PAA.

Additional minor and temporary noise impacts may come from equipment moving into and out of the project area, however, these will be limited to trucks and mobile equipment, which, based on modeling, generate less noise than other equipment – for example, noise generated by pneumatic tools or generators will not add to these transient increases in noise.

Alternative 2. Sources of noise from this alternative action are likely to be similar to that of Alternative 1, with the sources of noise being heavy machinery and construction activity in the project area. These minor and temporary impacts will be limited to the time of construction, and will not impact any people or businesses outside the construction area past that time.

However, based on the new pipeline route, additional noise impacts may be expected along the west side of Sloan Channel, and the areas of potential noise impact will extend further west into the businesses there and may have more potential for minor and temporary impacts on the area around the project site. Therefore, undertaking Alternative 2 will result in more people potentially being impacted by the temporary noise of the project.

The noise contours generated from the construction of Alternative 1 were mapped around the planned project route, similar to what was done for Alternative 1. Figure 2 depicts the area

impacted by construction noise in the process of constructing the pipeline according to the route set forth in Alternative 2.

Alternative 3. None of the construction proposed in Alternative 3 is likely to be of a scale or nature that could interfere with the mission or operations of Nellis AFB. Once construction is complete, the footprint of the construction area is likely to be even or nearly even with the current ground surface, and no significant structures are expected to be added to the area.

Common construction equipment will be used in the construction of the pipeline. The noise generated by this equipment will be different from the noise made by typical airplane activity at Nellis AFB. Aircraft noise is loud and intermittent, whereas noise made by construction equipment is quieter but more consistent. Sensitive noise receptors may find the more persistent construction noise to be an annoyance, despite being exposed to louder but less consistent noise produced by aircraft operating out of Nellis AFB.

Using RCNM, a model of the noise expected to be generated at the site was produced. Assuming a worst-case noise emissions scenario (i.e., pneumatic tools with an 85 dBA sound level at a distance of 50 feet), the noise model projected that noise levels of 85 dBA from a point source would attenuate to 75 dBA at 160 feet from the source, and to 65 dBA at 610 feet. A full accounting of sound attenuation with distance, calculated at distances with various equipment, is available in Table 4.1.

The construction noise was modeled, and the 65 dBA and 75 dBA noise contours were overlaid over a map of the proposed project area and adjacent neighborhoods. Road access to the construction site is on E. Carey Avenue, adjacent to the project site. According to the pathways of both pipeline routes under consideration, no noise sensitive receptors such as residential homes or parks are expected to be exposed to noise levels greater than 65 dBA by construction work on either pipeline.

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Additional minor and temporary noise impacts may come from equipment moving into and out of the project area, however, these will be limited to trucks and mobile equipment, which, based on modeling, generate less noise than other equipment – for example, noise generated by pneumatic tools or generators will not add to these transient increases in noise.

No Action Alternative. In the No-Action Alternative, no construction will be conducted, so no additional impacts to the noise environment will occur. No additional noise will be generated by taking the No-Action Alternative.

4.3 AIR QUALITY

Alternative 1 (Preferred Alternative). There are no significant impacts to air quality associated with this alternative. Temporary and minor increases in criteria pollutants 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 and placement of the pipeline and conduits. Air emissions

from this project are expected to be similar to that Alternative 2 and 3 (within the margin of error). Therefore, based on the ACAM results, a General Conformity Determination is not required and all projected emission associate with this alternative indicate no significant impact to air quality and no alternative is preferable to the others.

The ACAM was used to perform an assessment of the potential air quality impact/s associated with this Alternative in accordance with the Air Force Instruction 32-7040, Air Quality Compliance and Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). Summaries of the total emissions for this alternative are presented in Table 4.2. Details of the analyses are presented in Appendix C. Approximately 80% of Nellis AFB falls with maintenance are for PM10 and CO; therefore, and a General Conformity applicability analysis was performed using the ACAM. The ACAM estimated emissions for both PM10 and CO associated with the proposed action fall well below the General Conformity de minimis thresholds; therefore, the requirements of the General Conformity Rule are not applicable. Additionally, ACAM also simultaneously performed an assessment the air quality impacts associated with the other criteria pollutant that the area is in attainment with NAAQSs; which included ozone precursors (VOCs and NOx), sulfur oxide (SOx), nitrogen oxides (NOx), and Lead (Pb). Based on the results of the ACAM modeling for these pollutants, none of estimated emissions associated with this action are above the significance indicator values. Therefore, based on the ACAM results, a General Conformity Determination is not required and all projected emission associate with this alternative indicate no significant impact to air quality.

Table 4-2. Total Air Emissions from Construction Activities

Pollutant	Total (tons/year)	*General Conformity de minimis* Thresholds (tons/year)	*Significance* Indicator (tons/year)
CO	4.145	100	N/A
VOCs	0.756	N/A	100
NO_2	4.933	N/A	100
PM-10	6.739	100	N/A
PM-2.5	0.239	N/A	100
SO_2	0.009	N/A	100
GHGs (CO_2e)	922	N/A	N/A

There will also be a short-term increased greenhouse gases due to heavy equipment used during construction, and worker transportation for this alternative. Table 4-2 shows the projected annual GHG emissions associated with this alternative, which are basically the same as Alternative 2 and 3 (within the margin of error). Therefore, based on GHG emissions, no Alternative is preferable to the others from an Air Quality perspective.

Alternative 2. There are no significant impacts to air quality associated with this Alternative. Temporary and minor increases in criteria pollutants 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 and placement of the pipeline and conduits. Air emissions from this project are expected to be similar to that Alternative 1 and 3 (within the margin of error); therefore, the

projected emissions for Alternative 1 are considered representative for Alternatives 2 and 3 as well (see Table 4.2 and Appendix C for details). Therefore, based on the ACAM results, a General Conformity Determination is not required and all projected emission associate with this Alternative indicate no significant impact to air quality and no Alternative is preferable to the others.

Alternative 3. There are no significant impacts to air quality associated with this Alternative. Temporary and minor increases in criteria pollutants 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 and placement of the pipeline and conduits. Air emissions from this project are expected to be similar to that Alternative 1 and 2 (within the margin of error); therefore, the projected emissions for Alternative 1 are considered representative for Alternatives 2 and 3 as well (see Table 4.2 and Appendix C for details). Therefore, based on the ACAM results, a General Conformity Determination is not required and all projected emission associate with this Alternative indicate no significant impact to air quality and no Alternative is preferable to the others.

No Action Alternative. Under the No-Action Alternative, no construction will be done, and therefore there will be no diminishment in air quality as a result of the No-Action Alternative.

4.4 WATER RESOURCES

***Alternative 1 (Preferred Alternative)*.**

Surface Water - In general, reclaimed water contains more dissolved inorganic nutrients, such as phosphorus and nitrates, than comparable potable water. Any runoff from irrigation would have the same properties, which may contribute to diminished water quality from runoff from the course. However, this would be offset by a likely diminished use of fertilizer on the grass at NAGC as a result of having more nutrients available, likely leading to runoff quality remaining the same overall.

Any changes to surface water conditions are expected to be minimal as a result of this project. It would be possible to fill Raptor and Eagle Ponds with reclaimed water from CNLV-WRF. However, this impact is unlikely as the levels of these ponds has been kept low to reduce the number of birds in the area, to prevent bird strikes with aircraft operating at Nellis AFB. As a result of a product of irrigation of NAGC, runoff would be increased commensurate with the water added to the vegetation of the course to maintain its health, and some of this runoff would reach Sloan Channel.

During construction, USAF would require that contractors 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. Pathways for the impact of hazardous substances include oil leaks, mud splatters, and refuse from human activities. 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. When possible, it is recommended that this maintenance and refueling be done off-site. USAF would require that contractors 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.

As part of the project, contractors would be required to obtain an NDEP Construction Stormwater General Permit NVR100000, which would govern mitigation techniques for spills runoff. This permit requires the use of BMPs to control the flow, treatment, and discharge of stormwater across the site, limit contacts between stormwater and sources of pollutants, and control erosion so as to limit the sediment load of discharge. In addition, the permit requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP), which fully describes the BMPs and other measures being used to prevent pollution of the discharge and nearby waterways.

Construction run-off could enter the Sloan and/or Range Wash, this would be mitigated by installing Temporary Erosion Sedimentation control measures. These measures include silt fencing along the wash to ensure sediment laden run-off would not leave the construction area.

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 if these practices are followed correctly.

Groundwater - As this project is designed to convey reclaimed water between points within the area, the use of the pipeline may reduce the impact of groundwater extraction, as less water would need to be drawn from local wells, replaced with reclaimed water. Therefore, the net impact of the project to groundwater may be positive, with the magnitude of the benefit dependent on how much water the pipeline is designed to carry. In addition, no groundwater wells in the area around the project site would be impacted long-term, since no additional groundwater extraction is expected to take place to support the SVGC. In the event of a leak or rupture in the pipeline, the leaked water is not expected to be a pollutant, as the water has been treated to an acceptable level to be released into the natural environment, had it not been used in this way.

Some water would be extracted for dust control and soil compaction; the water used for these purposes would be taken from commercial supplies and would not have an impact on groundwater in the project area No drilling in preparation for construction is expected to encounter groundwater, and so impact through those means is not expected.

Water Quality – While the impact of this project on water quality is being controlled by the SWPPP which would govern this project, it is important to state the risk which the SWPPP would prevent. In this case, the primary source of impact would be sediment load from erosion off of disturbed soils, in the form of total dissolved solids. The use of construction equipment also allows the possibility of contamination by hydrocarbon fuels, fluids used in engines such as oils or coolants, and heavy metals. The SWPPP and SPCCP would both provide mitigation of these risks, but by continuing with this Alternative, these risks are made present.

Along with the impact of increased sediment load, another impact would come from the water being made available to the NAGC grounds: water from reclaimed sources has higher levels of inorganic nutrients, such as phosphorus and nitrates, both of which could cause harm to drinking water quality in high concentrations. These nutrients could be dissolved and carried to the Sloan Channel in runoff from irrigated areas.

In the event of a spill or leak in the pipeline, the water is considered non-potable, but not hazardous to human health. Beyond the direct impact of the spill itself, no environmental impact is anticipated in the event of an accidental release of water from the pipeline.

Alternative 2. This alternative would also add a considerable amount of water to the Eagle and Raptor Ponds on the golf course, increasing the amount of surface water available. Potential impacts to surface water, primarily the Sloan Channel, are expected to be similar to that of the Proposed Action, with leaks and accidental spills from heavy equipment, and eroded sediment being the greatest risks. A series of countermeasures to prevent these impacts would be in place, including an SPCCP and SWPPP, permitting the use of various BMPs to limit contact between pollutants, and surface water and/or storm water.

Impacts to groundwater would likely be similar to the impacts caused by Alternative 1. These impacts come primarily through the replacement of groundwater extraction with a supply of non-potable reclaimed water, causing more water to be available for other uses for groundwater.

Likewise, water quality impacts would be similar to that of Alternative 1. The primary routes come through sediment entering nearby waterways, increasing the total dissolved solids of the water. In addition, construction would bring with it the potential for a spill of hazardous material, primarily hydrocarbon fuels and fluids used in heavy equipment. These risks would be possible to be mitigated through the use of a SWPPP and SPCCP, which would provide BMPs and other techniques to reduce the potential for these impacts.

Reclaimed water would have higher levels of inorganic nutrients, which may cause impacts to nearby waterways through runoff from the NAGC grounds. While these are naturally occurring in water in small amounts, runoff from the course would increase these concentrations slightly. This impact may be offset by a reduced use of fertilizer on the grounds, however, at this point, this impact is not necessarily quantifiable.

In the event of a leak or rupture of the pipeline, any reclaimed water released is not considered harmful to the health of humans or other life. The pipeline is designed to be closed off in sections in such an event, but no environmental impact from a spill is anticipated besides the direct impact of the spill. This direct impact would include erosion, flooding, and the use of equipment to repair the site.

Alternative 3. This alternative would also add a considerable amount of water to the Eagle and Raptor Ponds on the golf course, increasing the amount of surface water available. Potential impacts to surface water, primarily the Sloan Channel, are expected to be similar to that of the Proposed Action, with leaks and accidental spills from heavy equipment, and eroded sediment being the greatest risks. A series of countermeasures to prevent these impacts would be in place, including an SPCCP and SWPPP, permitting the use of various BMPs to limit contact between pollutants, and surface water and/or storm water.

Impacts to groundwater would likely be similar to the impacts caused by Alternative 1 and 2. These impacts come primarily through the replacement of groundwater extraction with a supply of non-potable reclaimed water, causing more water to be available for other uses for groundwater.

Likewise, water quality impacts would be similar to that of Alternative 1 and 2. The primary routes come through sediment entering nearby waterways, increasing the total dissolved solids of the water. In addition, construction would bring with it the potential for a spill of hazardous material, primarily hydrocarbon fuels and fluids used in heavy equipment. These risks would be possible to be mitigated through the use of a SWPPP and SPCCP, which would provide BMPs and other techniques to reduce the potential for these impacts.

Reclaimed water would have higher levels of inorganic nutrients, which may cause impacts to nearby waterways through runoff from the NAGC grounds. While these are naturally occurring in water in small amounts, runoff from the course would increase these concentrations slightly. This

impact may be offset by a reduced use of fertilizer on the grounds, however, at this point, this impact is not necessarily quantifiable.

In the event of a leak or rupture of the pipeline, any reclaimed water released is not considered harmful to the health of humans or other life. The pipeline is designed to be closed off in sections in such an event, but no environmental impact from a spill is anticipated besides the direct impact of the spill. This direct impact would include erosion, flooding, and the use of equipment to repair the site.

No Action Alternative. Based on the No Action Alternative, no impacts are expected to surface water within the project area, as no action would be taken. Groundwater extraction would continue at a rate commiserate with what is currently occurring, leading to a diminished availability for groundwater elsewhere in the area. However, no impacts or increased risks to water quality are expected as a result.

4.5 SAFETY AND OCCUPATIONAL HEALTH

Alternative 1 (Preferred Alternative). The operation of heavy equipment and the movement of pipeline may pose a risk to the safety of workers and contractors during the period of construction. These risks can and would be mitigated wherever possible, through using proper BMPs, operation techniques, and personal protective equipment (PPE). Any impacts to the environment or to public safety are not expected to continue beyond construction.

Alternative 2. As with Alternative 1, none of the impacts are expected to proceed beyond the period of construction and the area of that construction. The mitigation techniques used for risks related to construction are likely to be the same.

Alternative 3. As with Alternative 1 and 2, none of the impacts are expected to proceed beyond the period of construction. The mitigation techniques used for risks related to construction are likely to be the same. The operation of heavy equipment and the movement of pipeline may pose a risk to the safety of workers and contractors during the period of construction. These risks can and would be mitigated wherever possible, through using proper BMPs, operation techniques, and personal protective equipment (PPE). Any impacts to the environment or to public safety are not expected to continue beyond construction.

No Action Alternative. As there is no construction being done as part of the No-Action Alternative, there would be no risks to safety or occupational health which would be enhanced in the event that the No-Action Alternative was selected.

4.6 HAZARDOUS MATERIALS / WASTE

Alternative 1 (Preferred Alternative). As part of the construction of the pipeline, the landfill site known as LF-01, has a potential to be disturbed. While this is unlikely, as the thickness of the cap is believed to be 70 feet, excavation in the area could potentially remobilize hydrocarbons that were released into the soil at depth. Based on the previous EA for the Nellis solar photovoltaic corridor, however, no other contaminants are expected to be encountered as part of excavation around the landfill site.

Construction introduces the possibility of an accidental release or spill of hazardous materials, from fuels and oils carried by construction equipment, or from storage of those materials on-site.

Control measures would be in place around equipment and storage sites, and would be fully described in the project's SWPPP in order to mitigate this risk to the property.

Alternative 2. Further risks to the environment as the result of hazardous materials are expected to be similar to the Proposed Action. The primary risk is due to accidental releases of automotive-related pollutants, such as fuels and oils. No contaminants are expected to be encountered during construction within the project area, and it is unlikely that excavation would remobilize previous hydrocarbon spills in the soil or groundwater.

Alternative 3. As with Alternative 2, Alternative 3 may have further risks to the environment as the result of hazardous materials are expected to be similar to the Proposed Action. The primary risk is due to accidental releases of automotive-related pollutants, such as fuels and oils. No contaminants are expected to be encountered during construction within the project area, and it is unlikely that excavation would remobilize previous hydrocarbon spills in the soil or groundwater.

No Action Alternative. With no construction or remediation being done, the No-Action Alternative is unlikely to present a risk to introduce or remobilize hazardous materials in the area of the project.

4.7 BIOLOGICAL / NATURAL RESOURCES

Alternative 1 (Preferred Alternative) and Alternative 3.

Vegetation - Vegetation and soils in the construction area would be disturbed temporarily, due to construction, excavation and the movement of equipment. No vegetation currently on site is considered native vegetation. However, these disturbances would be remediated to what was seen previous to construction. The increased availability of water rich in nutrients in the vicinity means vegetation would be improved.

Wildlife – Temporary disturbances to wildlife are expected as part of the construction process, involving heavy equipment and human activity. Once the reclaimed water line is active, more water may be available to support temporary habitats within the golf course, such as migratory birds.

Special Status Species - Under Alternative 1, no federally listed species under the ESA would be impacted because no species are known to occur in the Project Area, no suitable habitat is present in the Project Area, and a survey conducted did not document any species (Table 4.3). The project area is heavily disturbed by human activity and does not support habitat for ESA species.

The western burrowing owl, a BCC protected under the MBTA, was documented during a field survey conducted by Environmental Planning Group on March 21, 2017 (Figure 1). Occupied and unoccupied burrows were documented during the field survey. NAFB has constructed Burrowing Owl burrows along parts of the Project area as mitigation to offset past impacts to the species. In anticipation of the potential construction of the Project, entrances of some of these burrows have been blocked to prevent occupancy during the current nesting season (EPG, 2017). Construction and maintenance activities that result as part of Alternative 1 would have proper mitigation techniques consulted with and approved by USFWS to avoid burrows. Construction activities will be planned around the migratory bird breeding and nesting season (September 1 through February 28) to the extent possible and proper.

For work that occurs during migratory bird breeding seasons, areas where migratory birds could

be disturbed would be defined and proper mitigation techniques to avoid impacts would be in place when work takes place in those areas. An Avian Compliance Plan has been prepared for this project to meet these goals and is included in Appendix L.

Table 4.3. Effects Determinations for ESA Listed Special Status Species

Common Name *Latin Name*	Status	Critical Habitat	Habitat and Notes	Effects Determination	
				Species	Critical Habitat
Birds					
Yellow-billed Cuckoo *Coccyzus americanus*	FT	Proposed, Outside Project Area	Mature riparian woodlands.	No Effect	No Effect
Southwestern Willow Flycatcher *Empidonax traillii extimus*	FE	Proposed, Outside Project Area	Dense riparian habitat of willow, salt cedar, and box elder.	No Effect	No Effect
Reptiles					
Desert Tortoise *Gopherus agassizii*	FT	Yes, Outside Project Area	Sandy flats to rocky foothills in desert scrub where suitable soils for den construction exist.	No Effect	No Effect
Fish					
Pahrump Poolfish *Empetrichthys latos*	FE	No	Springs with mild temperatures.	No Effect	NA

Sources: (a) U.S. Fish and Wildlife Service, IPaC Database, http://ecos.fws.gov/ipac/, 2017.
(b) Nevada Natural Heritage Program,

FT – Federally Threatened
FE – Federally Endangered

Alternative 2.

Vegetation - Impacts to local vegetation and supporting soil would be similar to that seen in Alternative 1. Excavation and construction activities would disturb vegetation and soil temporarily, but these disturbances are limited to non-native vegetation and would be remediated wherever possible and the site restored to the condition seen previous to construction. The supply of remediated water would increase the water and nutrients available to this vegetation, potentially improving vegetation quality.

Wildlife – As in Alternative 1, temporary disturbances of wildlife and habitat that presently exists in the area are likely, due to the use of construction equipment and increased human activity. More water and artificial habitat may be available after construction, due to the enhancement of vegetation in the area of the project. However, due to continuing human disturbances and the unnatural state of the property, the impacts of the project on wildlife are likely to be minimal.

Special Status Species – The impacts of Alternative 2 on protected and ESA-listed species are likely to be similar to that of Alternative 1; the changes in route would take them through area that is similar to that of Alternative 1 and is therefore expected to have similar habitat available in the area.

Alternative 3.

Vegetation - Vegetation and soils in the construction area would be disturbed temporarily, due to construction, excavation and the movement of equipment. No vegetation currently on site is considered native vegetation. However, these disturbances would be remediated to what was seen previous to construction. The increased availability of water rich in nutrients in the vicinity means vegetation would be improved.

Wildlife – As in Alternative 1 and 2, temporary disturbances to wildlife are expected as part of the construction process, involving heavy equipment and human activity.

Special Status Species – The impacts of Alternative 3 on protected and ESA-listed species are likely to be similar to that of Alternative 1 and 2; the changes in route would take them through area that is similar to that of Alternative 1 and 2 and is therefore expected to have similar habitat in the area. A total of 15 species Federally listed as Threatened, Endangered, or as Candidates for Listing are known to occur in Clark County. According to a Data Report Letter studying the two-kilometer radius around the area of the project site, performed March 18, 2016 (Nevada Natural Heritage Program 2016), four listed species may have habitat around the project area. This study was done by the Nevada Natural Heritage Program (NNHP), and was based on past sightings of species of concern. A more comprehensive study for species in the area as it presently exists now is being planned. However, at present the effects to protected species is believed to be minimal. According to wildlife surveys dating from 2009, no Federal ESA-listed species have been located on site, and potential habitats for native ESA-listed species are unlikely to be present on site, as it is highly disturbed by human activity. Species distributions are believed to be similar to those seen in previous surveys.

The Las Vegas buckwheat (Eriogonum corymbosum var. nilesi) is a candidate for Federal listing, and is known to occur on portions of Nellis AFB, but does not occur on the golf course, closed landfill, or photovoltaic projects that comprise the project site. The Las Vegas bear poppy (Arctomecon californica) is a Nevada BLM Special Status Species, protected under state law as critically endangered. It has been sighted within a two-kilometer radius of the site as recently as 2006.

The desert tortoise (Gopherus agassizii) is known to occur within the Mojave Desert, and suitable habitat is present on parts of the Nellis Range. The project site under study in this report does not contain suitable habitat or food resources for desert tortoises.

The study commissioned from NNHP indicates that the spotted bat (Euderma maculatum) was sighted within the study radius in 1990. The spotted bat is listed as a sensitive species by the BLM, and a Threatened Mammal under the Nevada State Protected Species Classification. Due to the time between its last sighting and the present date, without further study it is unknown whether the spotted bat is still present within the area.

The western burrowing owl (*Athene cunicularia*) is a protected species under Nevada law, and is listed as a Sensitive Species by the Bureau of Land Management (BLM). Burrowing owls are also protected under the Migratory Bird Treaty Act of 1918, making it illegal **take (includes kill or injure) or possess** migratory birds, eggs, or occupied nests during breeding season. Habitat loss is a particular concern for owls within the Las Vegas Valley. During a site survey on April 2017, the western burrowing owl was sighted using burrows (Appendix H).

While there may be the potential to have Gila monsters (*Heloderma suspectum*) and chuckwalla (likely *Sauromalus ater*), a mitigation plan is not likely to be necessary as the area has little value as habitat for those animals.

At Nellis AFB, western burrowing owls are located along the top of the Sloan Channel banks, and are known to utilize abandoned ground squirrel burrows or man-made burrows and holes throughout the landfill and golf course. Construction and maintenance activities that result as part of Alternative 3 should be designed to avoid these burrows.

Based on the listed species present in the area, the primary impact would be to migratory birds, including the western burrowing owl. For work that occurs during migratory bird breeding seasons, generally defined in the Las Vegas area as September and February, areas where these birds could be disturbed should be defined and proper mitigation techniques to avoid impacts should be in place when work takes place in those areas. An Avian Compliance Plan has been prepared for this project to meet these goals.

No Action Alternative.

Vegetation - Under the No Action Alternative, no direct impact to plant species currently present on the project site would occur. The land currently under study would remain mostly the same, and any plants growing on the currently existing soil is unlikely to be disturbed. In the event that it is determined that the NAGC is to be decommissioned due to expense or difficulty of obtaining water, the vegetation that presently exists would likely be degraded, and may be replaced with native vegetation through natural processes over time.

Wildlife – With the No Action Alternative, no direct impacts to wildlife or wildlife habitat are expected to result due to the No Action Alternative. In the event that the NAGC is decommissioned, the area could return to habitat more palatable for the wildlife common to the Las Vegas Valley.

Special Status Species – No direct impact to protected or ESA-listed species is expected as a result of the No Action Alternative. The disturbances proposed in the other Alternatives would not occur, and no degradation of suitable habitat for ESA-listed species, temporary or permanent, is expected as a result of not taking action.

4.8 EARTH RESOURCES

Alternative 1 (Preferred Alternative).

Soils - Alternative 1 involves considerable excavation in order to construct the pipeline along its alignment. While this alignment was selected in order to minimize the footprint of the project and therefore its impact on soils, this project would still have an impact on these soils, due to movement, potential erosion, and the operation of heavy equipment. A failure or damage of the pipeline may result in further erosion due to releases of water. Most of the soils currently on the site are not considered to be native soils, but have been brought in as fill material to modify the ground level as part of NAGC. As a result of this, these soils may be more susceptible to erosion than native soils.

The impact of Alternatives 1 is likely to be temporary. Soils disturbed during construction would be returned to the trenches from which they were excavated wherever possible. While vegetation is sparse, construction would disturb organic materials such as roots which would naturally reduce erosion, and for a time after construction, erosion would occur at a higher rate while the vegetation recovers.

Erosion control measures to reduce the impact are already in place as part of the construction of Sloan Channel. Construction methods for soil placement, grading, trenching, and pipe placement would utilize best management practices (BMPs) to reduce soil erosion. Examples of these include, but are not limited to:

- Silt fencing or sediment traps around Sloan Channel and the construction area,
- Wetting of disturbed soils to limit airborne dust,
- The use of geotextile fabric or other cover material, both above and below disturbed soil, in areas where soil is being moved,
- Regular inspection and repair of erosion control features, and further inspection after rainfall events where greater than 0.5 inches of precipitation occur,
- Earthen berms around sloped areas to reduce the amount of water displacement, while redirecting runoff to further erosion control areas, and
- Restoration of the project area to approximately the condition in place prior to construction, including temporary roadways and material stockpiles. This process would include soil compaction, debris removal, and revegetation of the area when practicable.

These measures would be taken in accordance with Section 94 (Permitting and Dust Control for Construction Activities) of the Clark County Department of Air Quality regulations. Further BMPs would be implemented as necessary, based on the Nevada Contractors' Guide for Construction Site Practices, which sets out further, unofficial guidelines for erosion control, permitting and other methods to reduce the impact of construction activities. All contractors performing work as part of this project would be required to implement these practices. In addition, the contractor for excavation work would be required to obtain a Dust Control Permit, which requires that a Dust Mitigation Plan be created, containing any mitigation measures to be undertaken during normal construction activities. As part of BMPs, the project would also be covered by a stormwater pollution prevention plan (SWPPP) which would also cover methods and design features used to limit erosion.

The alignment of the pipeline is expected to pass over a site designated as Nellis Landfill, or Environmental Restoration Program (ERP) site LF-01, which was in use between 1942 and 1972. Site LF-01 accepted waste from fuel storage tanks and wastewater treatment processes during that time. Currently, the landfill is capped, and the surface condition is mostly bare soil, consisting of dead turf grass and holes from previous excavation related to decommissioning. In 2007, the USAF and Nevada Department of Environmental Protection (NDEP) determined that no further action was required to be done to remediate the site. . The landfill cap would not be functionally impacted, and excavation for installation of the pipeline would occur solely within fill material above the cap.

While excavation within the footprint of LF-01 is expected, it is unlikely that the cap would be disturbed due to its thickness and the depth to the cap layer, as construction of the Nellis solar facility in its vicinity has added pavement and further fill material on top of the cap. In case debris from the landfill is encountered during excavation, efforts would be made to analyze, classify, and contain debris and the surrounding soil while avoiding excessive remobilization of potentially contaminated material. The depth of trenching expected to be done in this project should not expose groundwater to impact - ongoing monitoring of landfill site LF-01 indicates that groundwater is 70 feet below the surface in this area.

Alternative 2.

Soils – Alternative 2 involves significant excavation of the soil in order to install the reclaimed water pipeline as described in the accompanied DOPAA. This excavation would open up portions of the soil to the risk of erosion during trenching, movement and refilling of the construction area, as well as the potential for contamination by releases of pollutants from the equipment used. Soils to be disturbed during construction are mostly fill material, introduced elsewhere to modify the level of ground in the area of the NAGC.

These impacts are expected to be temporary, existing within the time of construction and for some time after. Trenching and excavation would disturb vegetation and other features which limit erosion, and increased erosion would continue until the area is revegetated. Further impact may occur through an unintentional release or leakage from the pipeline itself, but this risk is limited to local erosion, as contamination is unlikely.

Mitigation measures would be similar to that described in the impacts of Alternative 1 on soils, including, but not limited to, the implementation of a SWPPP, construction features and practices designed to limit erosion and unintended movement of soil, control measures for airborne dust, and restoration of the area to its previous condition after construction.

As with Alternative 1, the proposed route is believed to pass over ERP Site LF-01, and special precautions may be necessary in the event that contaminated material was encountered during excavation to limit their impact. However, due to the thickness of the cap over the site compared to the depth of excavation planned, this route for impact is believed to be unlikely.

Alternative 3.

Soils -

Soils – As with Alternative 1 and 2, Alternate 3 involves significant excavation of the soil in order to install the reclaimed water pipeline as described in the accompanied DOPAA. This excavation would open up portions of the soil to the risk of erosion during trenching, movement and refilling of the construction area, as well as the potential for contamination by releases of pollutants from the equipment used. Soils to be disturbed during construction are mostly fill material, introduced elsewhere to modify the level of ground in the area of the NAGC.

These impacts are expected to be temporary, existing within the time of construction and for some time after. Trenching and excavation would disturb vegetation and other features which limit erosion, and increased erosion would continue until the area is revegetated. Further impact may occur through an unintentional release or leakage from the pipeline itself, but this risk is limited to local erosion, as contamination is unlikely.

Mitigation measures would be similar to that described in the impacts of Alternative 1 on soils, including, but not limited to, the implementation of a SWPPP, construction features and practices designed to limit erosion and unintended movement of soil, control measures for airborne dust, and restoration of the area to its previous condition after construction.

No Action Alternative.

Soils – With the No Action Alternative, no construction would take place, and no impact to soils would occur as a direct impact of this Alternative. In case that the NAGC is decommissioned, the degradation in vegetation and subsequent loss of roots to hold soil in place may result in increased soil erosion.

4.9 INFRASTRUCTURE

Alternative 1 (Preferred Alternative).

No excessive adverse impact on local infrastructure or utilities would occur as a result of Alternative 1, and while the pumping system used to direct water towards the NAGC would require additional electricity to operate, most of this electricity would come from the pre-existing Nellis AFB photovoltaic system and the environmental impact of this additional draw is likely to be minimal. In the long-term, there would be a beneficial impact on water use in the Nellis AFB area, as the reclaimed water line is designed to move water between points on the air force base. In the future, use of this reclaimed water would reduce the amount of potable water needed for use on the base.

During construction, short-term adverse impacts on local transportation would occur, due to the delivery of construction equipment to the site. Additional deliveries of soil (per Executive Order 13112 prohibits the introduction of alien species including “weed seed.”), concrete, and pipe sections would be necessary. These deliveries would traverse N. Nellis Boulevard, N. Las Vegas Boulevard, E. Craig Avenue, and the streets on Nellis AFB property leading to the project site. Such deliveries may result in minor traffic delays on these roads during daytime hours, but these impacts would be limited to the time of construction. No long-term impacts on traffic are expected.

Buried utilities are expected to be within the utility corridor, which serves as the main route for construction. Therefore, care would be taken to avoid disrupting utilities during excavation and installation of the pipeline, including locating buried utilities in the soil. However, these location services are not completely accurate, and despite these precautions, excavation may pose a risk to these buried utilities.

Alternative 2

As with Alternative 1, the impact on local infrastructure or utilities is unlikely to be excessive. Additional electricity would be drawn from the Nellis AFB photovoltaic site to pump water from CNLV-WRF and NAGC and operate the automated pumping equipment. The environmental impact of this electricity is expected to be minimal, as the facilities to generate solar electricity already exist. The use of potable water would be decreased in the long term, as the reclaimed water would replace its use on the NAGC.

Minor traffic delays would be anticipated in the area of the project, as heavy equipment and supplies would be delivered to the site via N. Nellis Boulevard, N. Las Vegas Boulevard, E. Craig Avenue, and the streets on Nellis AFB property. These delays would be limited to daytime hours within the time of construction, and no long-term delays are expected beyond the time of construction.

This route was removed from consideration during the construction of the Nellis AFB photovoltaic site and its related utility corridor, as the route is believed to cross several buried utility lines. These lines include an 8-inch sewer line operated by Clark County Water Reclamation District (CCWRD) and a 27-inch potable water main operated by the Southern Nevada Water Authority (SNWA). Construction of this alternative would have to account for these obstructions.

Alternative 3.

No excessive adverse impact on local infrastructure or utilities would occur as a result of Alternative 3, and while the pumping system used to direct water towards the NAGC would require additional electricity to operate, most of this electricity would come from the pre-existing Nellis

AFB photovoltaic system and the environmental impact of this additional draw is likely to be minimal. In the long-term, there would be a beneficial impact on water use in the Nellis AFB area, as the reclaimed water line is designed to move water between points on the air force base. In the future, use of this reclaimed water would reduce the amount of potable water needed for use on the base.

During construction, short-term adverse impacts on local transportation would occur, due to the delivery of construction equipment to the site. Additional deliveries of soil (per Executive Order 13112 prohibits the introduction of alien species including "weed seed."), concrete, and pipe sections would be necessary. These deliveries would traverse N. Nellis Boulevard, N. Las Vegas Boulevard, E. Craig Avenue, and the streets on Nellis AFB property leading to the project site. Such deliveries may result in minor traffic delays on these roads during daytime hours, but these impacts would be limited to the time of construction. No long-term impacts on traffic are expected.

Buried utilities are expected to be within the utility corridor, which serves as the main route for construction. Therefore, care would be taken to avoid disrupting utilities during excavation and installation of the pipeline, including locating buried utilities in the soil. However, these location services are not completely accurate, and despite these precautions, excavation may pose a risk to these buried utilities.

No Action Alternative

In the No Action Alternative, no changes in infrastructure or potential risks to existing infrastructure are anticipated. However, the use of potable water to irrigate the NAGC would continue, resulting in significant drawdown of groundwater in the Las Vegas valley. If the NAGC is decommissioned, this impact would not continue.

4.10 OTHER NEPA CONSIDERATIONS

4.10.1 Unavoidable Adverse Effects

This EA identifies any unavoidable adverse impacts that would be required to implement the Proposed Action and the significance of the potential impacts to resources and issues. Title 40 of the *Code of Federal Regulations* §1508.27 specifies that a determination of significance requires consideration of context and intensity. Unavoidable long-term impacts associated with all Alternatives 1, 2, and 3 include the installation of a pipeline for reclaimed water, and the removal of fill material from the area of NAGC.

Unavoidable short-term adverse impacts associated with Alternatives 1, 2, or 3 would include temporary erosion and sedimentation from soils disturbance, a temporary increase in fugitive dust and air emissions during construction, intermittent noise, and minor alterations to local traffic around the base. However, these effects are considered minor and would be confined to the immediate area. Use of environmental controls and implementing controls required in permits and approvals obtained would minimize these potential impacts.

For the Alternatives to be accomplished, these impacts would occur. The proposed action is required to provide reclaimed water to the NAGC for its continued operation, while making this operation more sustainable and causing less impact on the environment around the NAGC site.

4.10.2 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between short-term uses and enhancement of long-term productivity from implementation of the Proposed Action is evaluated from the standpoint of short-term effects and long-term effects. Short-term effects would be associated with construction activities to install the

reclaimed water pipeline. A long-term enhancement of productivity and sustainability would be associated with the replacement of potable water with a reclaimed source if Alternatives 1, 2, or 3 were implemented.

The Proposed Action represents an enhancement of long-term productivity and sustainability for the use of the NAGC. The negative effects of short-term operational changes during construction activities would be minor compared to the positive benefits from the continued operation of NAGC, using a more sustainable source of water. Immediate and long-term benefits would be realized for operation and morale after the implementation of Alternatives 1, 2, or 3.

4.10.3 Irreversible and Irretrievable Commitments of Resources

This EA identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action if implemented. An irreversible effect results from the use or destruction of resources (e.g., energy) that cannot be replaced within a reasonable time. An irretrievable effect results from loss of resources (e.g., endangered species) that cannot be restored as a result of the Proposed Action. The short-term irreversible commitments of resources that would occur would include planning and engineering costs, building materials and supplies and their cost, use of energy resources during construction, labor, generation of fugitive dust emissions, and creation of temporary construction noise. Long-term irreversible commitments for resources would include a further draw of energy resources to operating the pumping system at the CNLV-WRF.

4.11 CUMULATIVE EFFECTS

This EA also considers the effects of cumulative impacts as required in 40 CFR §1508.7 and concurrent actions as required in 40 CFR §1508.25 [1]. A cumulative impact, as defined by the CEQ (40 CFR §1508.7) is the "…impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

SVGC currently utilizes groundwater and potable water from existing wells and CNLV, respectively, for irrigation. Cumulative beneficial effects on SVGC would result from the Proposed Action, in that the reclaimed water from CNLV-WRF would be used in lieu of the potable water from CNLV and less expensive, in exchange for the out grant of Nellis lands to CNLV for construction and operation of the reclaimed waterline. Through time, reduced costs for irrigation could result in savings of several million dollars in USAF water costs.

Several recently approved projects have been constructed on Nellis. CNLV completed their WRF located where the Proposed Action will start from. The WRF was built on Nellis lands and provides additional wastewater recycling to Nellis. Storm water detention basins have been built 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. Further, American Recovery and Reinvestment Act projects have been funded and are being constructed 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 this growth, new roads would be constructed, and existing

roads would be expanded and improved. It's not known where the growth or expansion would occur, but the new reclaimed water line would improve the availability of water for irrigation and SVGC would not have to rely on potable water from the CNLV 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 water supply would lead to additional development of undeveloped lands. Although in urban areas such as Clark County most of these lands are previously disturbed, some land remain with native plant communities that support diverse wildlife use by species uniquely adapted for life in the desert. Commercial and residential development of undeveloped lands permanently changes land use and degrades biological resources. The Las Vegas Valley aesthetics are also permanently altered through increased development as the visual quality of the wide-open spaces and mountain vistas are reduced. Because the Proposed Action is located on previously disturbed land, the cumulative impacts on land use and biological communities are considered to be minor.

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

Short-term cumulative impacts on noise would also occur from the Proposed Action during construction. The construction noise is occurring from nearby commercial and industrial development along Nellis Boulevard, and would occur at the proposed project site and in surrounding neighborhoods.

No significant adverse cumulative impacts would occur during the construction and operation of the reclaimed water line, and only short-term adverse cumulative impacts on noise and transportation would be realized during construction of the water line. Long-term beneficial cumulative impacts would occur for SVGC and NAFB from future potable water costs and a greater use of a renewable resource.

5.0 LIST OF PREPARERS

This EA has been prepared under the direction of the Air Force Civil Engineer Center, USAF, *and*

The individuals that contributed to the preparation of this EA are listed below.

Table 5-1. List of Preparers

Name/Organization	Education	Resource Area	Years of Experience
David Decker/GES	Bachelor of Science	Environmental Science, Geology	1
Darla Guerrero, P.E./Greeley-Hansen	Bachelor of Science	Civil Engineering	27
Brian Loffman, P.E./GES	Bachelor of Science	Environmental Science, Water Resources	25
Jennifer Burns/EPG			
Don Kelly/EPG		Environmental Planner	

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6.0 PERSONS AND AGENCIES CONSULTED/COORDINATED

The following Persons and Agencies were contacted in the preparation of this EA:

Table 6-1. Persons and Agencies Consulted/Coordinated

Federal Agencies	
Kish Lapierre U.S. Air Force Nellis AFB Archaeologist Nellis AFB, NV	Ann Bedlion U.S. Air Force Department of Natural Resources Avian Compliance Plan
Douglas Fitzpatrick U.S. Air Force 99 CES/CENMP Base Civil Engineering, Deputy	Stephanie McCary U.S. Air Force Department of Environmental Restoration Soil and Debris Management Plan
Reginald Merriman 99 CES/CENMP Nellis AFB Civil Engineering Design Phase	
State Agencies	
Mr. Raymond Hess, Director of Planning Services Regional Transportation Commission of Southern Nevada 600 S. Grand Central Parkway, Suite 350 Las Vegas, NV 89106	Mr. Skip Canfield Nevada State Clearinghouse Department of Administration Division of Budget & Planning 209 East Muster Street, Room 200 Carson City, NV 89701-4298
Commissioner Steve Sisolak, Chairperson Clark County Commission 500 Grand Central Parkway Las Vegas, NV 89155	Ms. Jennifer Olsen Southern Nevada Regional Planning Coalition 240 Water Street, Mail Stop 115 Henderson, NV 89009
Mr. Bob Ross, Field Manager Bureau of Land Management Las Vegas Field Office 4701 Torrey Pines Drive Las Vegas, NV 89130	Ms. Rebecca Palmer, Deputy State Historic Preservation Office, Preservation Service Manager Nevada State Historic Preservation Office 901 S. Stewart St., Suite 5004 Carson City, NV 89701
Local Agencies	
Mr. Mario Bermudez, Planning Manager Clark County Department of Comprehensive Planning 500 S. Grand Central Parkway, First Floor Las Vegas, NV 89155	Ms. Carolyn Edwards Trustee, District F Clark County School District 5100 W. Sahara Ave Las Vegas, NV 89146
Mr. Al Leskys Senior Air Quality Specialist Clark County Department of Air Quality & Environmental Management 4701 West Russell Road, Suite 200 Las Vegas, NV 89118-2231	Mr. Marc Jordan, Acting Director City of North Las Vegas Community Development, Planning & Zoning Division 2250 Las Vegas Blvd North, Suite 114 North Las Vegas, NV 89030

Mr. Martyn James, Director of Planning Services Regional Transportation Commission of Southern Nevada 600 S. Grand Central Parkway, Suite 350 Las Vegas, NV 89106	
Other Stakeholders	
Mr. Dan Balduini U.S. Fish and Wildlife Service Nevada Fish and Wildlife Office 1340 Financial Boulevard, Suite 234 Reno, NV 89502	Mr. Bob Ross, Field Manager Bureau of Land Management Las Vegas Field Office 4701 Torrey Pines Drive Las Vegas, NV 89130
Tribal Agencies	
Nevada's Indian Territory Nuwu Tribal Chair or THPO 5366 Snyder Avenue Carson City, NV 89701	**Lone Pine Paiute-Shoshone Tribe** Ms. Mary Wuester-Chairperson P.O. Box 747 975 Teya Road Lone Pine, CA 93545 Office-760-876-1034-Fax-760-876-4682 Copy of any cover letter to: Ms. Janice Aten-Environmental Director-760-876-4690
Big Pine Paiute Tribe Ms. Shannon Romero, Chairperson P.O. Box 700 825 South Main Street, Big Pine, CA 93513 Office-760-938-2003 Fax-760-938-2942 Ms. Danelle Gutierrez-THPO Mr. Ross Stone-Elder-760-938-3030	**Timbisha Shoshone Tribe** Mr. George Gholson, Tribal Chairperson 621 West Line St. Suite 109 Bishop, CA 93515 Office-760-872-3614-Fax-760-690-4486 Copy of any cover letter to: Ms. Barbara Durham-THPO-PO Box 358, Death Valley, CA 92328
Bishop Paiute Tribe Mr. Gerald Howard, Chairperson 50 Tusu Lane Bishop, CA 93514 Office-760-873-3584-Fax-760-873-8255 Copy of any cover letter and enclosures to: Mr. Raymond Andrews-THPO (ext-250)	**Benton Paiute Tribe** Tina Braithwaite, Chairperson Utu Utu Gwaitu Paiute Tribe 25669 Highway 6, PMB I Benton, CA 93512 Office-760-933-2321
Ft. Independence Paiute Tribe Mr. Norman Wilder, Chairperson P.O. Box 67 131 North Hwy 395 Independence, CA 93526 Office-760-878-5155-Fax-760-878-2311 THPO-Stephanie Arman	**Duckwater Shoshone Tribe** Rodney Mike, Chairperson 511 Duckwater Falls, P.O. Box 140068 Duckwater, NV 89314-0068 Office-775-863-0444-Fax-775-863-4451 Maurice Frank-Churchill-THPO
Chemehuevi Indian Tribe Charles Wood, Chairperson P.O. Box 1976 Havasu Lake, CA 92363 Office-760-858-4219-Fax-760-858-5400	**Yomba Shoshone Tribe** Wayne Dyer, Chairperson Daryl Brady, Vice-Chairperson HC 61, Box 6275 Austin, NV 89310 Office-775-964-2463-Fax-775-964-2443

Kaibab Band of Southern Paiutes Roland Maldonado, Chairperson HC 65 Box 2 Fredonia, AZ 86022 Office-928-643-7245-Fax-928-643-7260	**Ely Shoshone Tribe** Victor McQueen Jr., Chairman 16 Shoshone Circle Ely, NV 89301 Office-775-289-2319-Fax-775-289-3833
Las Vegas Paiute Tribe Benny Tso, Chairperson #1 Paiute Drive Las Vegas, NV 89106 Office-702-386-3926-Fax-702-383-4019-Cell-702-383-4019	**Paiute Indian Tribes of Utah** Tamra Borchardt-Slayton, Chairperson 440 North Paiute Drive Cedar City, UT 84721 Office-435-586-1112-Fax-435-586-7388
Moapa Band of Paiutes Darren Daboda, Chairperson P.O. Box 340 Moapa, NV 89025 Office-702-865-2787-Fax-702-865-2875	**Colorado River Indian Tribes** Dennis Patch, Chairperson 26600 Mohave Road Parker, AZ 85344 Office-928-669-1222
Pahrump Paiute Tribe Richard Arnold P.O. Box 3411 Pahrump, NV 89041 Office-775.764.1462	**Ft. Mojave Tribe** Timothy Williams, Chairperson 500 Merriman Avenue Needles, CA 92363 Office-760-629-4591-Fax-760-629-5767

7.0 REFERENCES

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Appendix A

Interagency/Intergovernmental Coordination and Public Participation

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Mr. Bob Ross, Field Manager
Bureau of Land Management, Las Vegas Field Office
4701 North Torrey Pines Dr.
Las Vegas, NV 89130

Dear Mr. Ross,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

The preferred alternative is to construct and maintain approximately 12,100 linear feet of pipeline in of two locations under consideration. The preferred alternatives runs parallel to the Nevada Energy feeder line previously constructed within this corridor. This alternative would disturb the least amount of area, limit unknown utility conflicts, and limit disruption to the SVGC.

The EA will assess the potential environmental consequence associated with the preferred action and alternatives. The EA will also examine the cumulative effects when combined with past, present, and any future proposals. In support of this process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the EA.

The Nellis AFB point of contact for Environmental Planning is Mr. Tod Oppenborn. Please send him your comments and concerns at 6020 Beale Ave, Nellis AFB, NV, 89191-6520, or by email at tod.oppenborn@us.af.mil. Though we will consider comments received at any time during the environmental impact analysis process to the extent possible, we would like to hear from you within 30 day of receipt of this letter. Thank you in advance for your assistance in this effort.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Commissioner Steve Sisolak, Chairperson
Clark County Commission
500 Grand Central Parkway
Las Vegas, NV 89155

Dear Commissioner Sisolak,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

The preferred alternative is to construct and maintain approximately 12,100 linear feet of pipeline in of two locations under consideration. The preferred alternatives runs parallel to the Nevada Energy feeder line previously constructed within this corridor. This alternative would disturb the least amount of area, limit unknown utility conflicts, and limit disruption to the SVGC.

The EA will assess the potential environmental consequence associated with the preferred action and alternatives. The EA will also examine the cumulative effects when combined with past, present, and any future proposals. In support of this process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the EA.

The Nellis AFB point of contact for Environmental Planning is Mr. Tod Oppenborn. Please send him your comments and concerns at 6020 Beale Ave, Nellis AFB, NV, 89191-6520, or by email at tod.oppenborn@us.af.mil. Though we will consider comments received at any time during the environmental impact analysis process to the extent possible, we would like to hear from you within 30 day of receipt of this letter. Thank you in advance for your assistance in this effort.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

MAR 0 1 2017

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

Mr. John Mendoza, Senior Planner
Clark County Department of Air Quality & Environmental Management
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155

Dear Mr. Mendoza,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

The preferred alternative is to construct and maintain approximately 12,100 linear feet of pipeline in of two locations under consideration. The preferred alternatives runs parallel to the Nevada Energy feeder line previously constructed within this corridor. This alternative would disturb the least amount of area, limit unknown utility conflicts, and limit disruption to the SVGC.

The EA will assess the potential environmental consequence associated with the preferred action and alternatives. The EA will also examine the cumulative effects when combined with past, present, and any future proposals. In support of this process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the EA.

The Nellis AFB point of contact for Environmental Planning is Mr. Tod Oppenborn. Please send him your comments and concerns at 6020 Beale Ave, Nellis AFB, NV, 89191-6520, or by email at tod.oppenborn@us.af.mil. Though we will consider comments received at any time during the environmental impact analysis process to the extent possible, we would like to hear from you within 30 day of receipt of this letter. Thank you in advance for your assistance in this effort.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

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Guerrero, Darla

From: OPPENBORN, TOD GS-11 USAF ACC 99 CES/CENPP <tod.oppenborn@us.af.mil>
Sent: Thursday, March 23, 2017 1:03 PM
To: Guerrero, Darla
Subject: FW: EA for Reclaimed Waterline at Nellis AFB

Darla,

Received this response to the IICEP letters that were sent out. Should be referenced in the air section of the EA.

Please not and comply.

Thanks
Tod

-----Original Message-----
From: Al Leskys [mailto:LESKYS@ClarkCountyNV.gov]
Sent: Thursday, March 23, 2017 12:43 PM
To: OPPENBORN, TOD GS-11 USAF ACC 99 CES/CENPP <tod.oppenborn@us.af.mil>
Cc: Brenda Whitfield <WHITFIELD@ClarkCountyNV.gov>; Mike Sword <SWORD@ClarkCountyNV.gov>
Subject: EA for Reclaimed Waterline at Nellis AFB

Dear Mr. Oppenborn:

The Clark County Department of Air Quality (Air Quality) is in receipt of your letter dated March 1, 2017, regarding the preparation of an Environmental Assessment (EA) for the proposed City of North Las Vegas (CNLV) Reclaimed Waterline project located at Nellis Air Force Base (AFB). The Reclaimed Waterline would extend from the CNLV Water Reclamation Facility to the Sunrise Vista Golf Course and Raptor Pond located on Nellis AFB property. As described, the proposed action is needed to provide irrigation to the golf course in accordance with an Enhanced Use Lease Agreement between the CNLV and the United States Air Force, and the preferred alternative is to construct and maintain approximately 12,100 linear feet of pipeline.

The proposed project would be located in Hydrographic Area 212 (Las Vegas Valley), which is a maintenance area for carbon monoxide, ozone, and PM10 pollutants. PM10 is the pollutant primarily associated with construction activities and there are several provisions of the AQRs that regulate construction within the Las Vegas Valley. In particular, Section 94 of the AQRs requires, among other things, that a dust control permit be obtained prior to soil disturbance or construction activities impacting 0.25 acres or more in overall area, or when there is mechanized trenching of 100 feet or more in length.

When construction activities exist, Best Available Control Measures (BACM) must be employed. These measures are described in a Construction Activities Dust Control Handbook available at: http://www.clarkcountynv.gov/airquality/compliance/Pages/Compliance_DustForms.aspx <http://www.clarkcountynv.gov/airquality/compliance/Pages/Compliance_DustForms.aspx>

Thank you for the opportunity to provide these comments. If you have any questions or concerns, please contact me at (702) 455-0679.

Sincerely,

Al Leskys

Senior Air Quality Specialist

Clark County Department of Air Quality

Planning Division

4701 W. Russell Rd, Suite 200

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Mr. Mario Bermudez, Planning Manager
Clark County Department of Comprehensive Planning
500 S. Grand Central Parkway, First Floor
Las Vegas, NV 89155

Dear Mr. Bermudez,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

The preferred alternative is to construct and maintain approximately 12,100 linear feet of pipeline in of two locations under consideration. The preferred alternatives runs parallel to the Nevada Energy feeder line previously constructed within this corridor. This alternative would disturb the least amount of area, limit unknown utility conflicts, and limit disruption to the SVGC.

The EA will assess the potential environmental consequence associated with the preferred action and alternatives. The EA will also examine the cumulative effects when combined with past, present, and any future proposals. In support of this process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the EA.

The Nellis AFB point of contact for Environmental Planning is Mr. Tod Oppenborn. Please send him your comments and concerns at 6020 Beale Ave, Nellis AFB, NV, 89191-6520, or by email at tod.oppenborn@us.af.mil. Though we will consider comments received at any time during the environmental impact analysis process to the extent possible, we would like to hear from you within 30 day of receipt of this letter. Thank you in advance for your assistance in this effort.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

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Nellis AFB, NV 89191-6520

MAR 0 1 2017

Ms. Carolyn Edwards
Trustee, District F
Clark County School District
5100 W. Sahara Avenue
Las Vegas, Nv 89146

Dear Ms. Edwards,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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The Nellis AFB point of contact for Environmental Planning is Mr. Tod Oppenborn. Please send him your comments and concerns at 6020 Beale Ave, Nellis AFB, NV, 89191-6520, or by email at tod.oppenborn@us.af.mil. Though we will consider comments received at any time during the environmental impact analysis process to the extent possible, we would like to hear from you within 30 day of receipt of this letter. Thank you in advance for your assistance in this effort.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Mr. Skip Canfield
Nevada State Clearinghouse
Department of Administration
Division of Budget & Planning
209 East Muster Street, Room 200
Carson City, NV 89701-4298

Dear Mr. Canfield,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DATE: 3/2/2017

TO: Nevada State Clearinghouse, DCNR

FROM: Nevada Division of Environmental Protection, Bureau of Water Pollution Control

SUBJECT: State Clearinghouse Comments for E2017-103 (EA – City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis AFB)

Disclaimer: The Nevada Division of Environmental Protection (NDEP), Bureau of Water Pollution Control (BWPC) does not have authority for projects occurring on Tribal Lands.

The NDEP, BWPC has received the aforementioned State Clearinghouse item and offers the following comments:

The project may be subject to BWPC permitting. Permits are required for discharges to surface waters and groundwaters of the State (Nevada Administrative Code NAC 445A.228). BWPC permits include, but are not limited to, the following:

- Stormwater Industrial General Permit
- De Minimis Discharge General Permit
- Pesticide General Permit
- Drainage Well General Permit
- Temporary Permit for Discharges to Groundwater's of the State
- Working in Waters Permit
- Wastewater Discharge Permits
- Underground Injection Control Permits
- Onsite Sewage Disposal System Permits
- Holding Tank Permits

Please note that discharge permits must be issued from this Division before construction of any treatment works (Nevada Revised Statute 445A.585).

For more information on BWPC Permitting, please visit our website at: http://ndep.nv.gov/bwpc/index.htm.

Additionally, the applicant is responsible for all other permits that may be required, which may include, but may not be limited to:

- Dam Safety Permits - Division of Water Resources
- Well Permits - Division of Water Resources
- 401 Water Quality Certification - NDEP
- 404 Permits - U.S. Army Corps of Engineers
- Air Permits - NDEP
- Health Permits - Local Health or State Health Division
- Local Permits - Local Government

Thank you for the information and the opportunity to comment.

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

MAR 0 1 2017

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

Mr. Marc Jordan, Acting Director
City of North Las Vegas, Planning & Zoning
2250 Las Vegas Boulevard North, Suite 114
North Las Vegas, Nevada 89030

Dear Mr. Jordan,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

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Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Mr. Raymond Hess, Director of Planning Services
Regional Transportation Commission of Southern Nevada
600 South Grand Central Parkway, Suite 350
Las Vegas, Nevada 89106

Dear Mr. Hess,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Mr. Jacob Snow, General Manager
Regional Transportation Commission of Southern Nevada
600 S. Grand Central Parkway, Suite 350
Las Vegas, NV 89106

Dear Mr. Snow,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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CHARLES W. ROWLAND JR.
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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

MAR 0 1 2017

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

Ms. Rebecca Palmer, Deputy State Historic Preservation Officer, Preservation Services Manager
Nevada State Historic Preservation Office
901 S. Stewart Street, Suite 5004
Carson City, Nevada 89701

Subject: Introduction of the Proposed City of North Las Vegas Reclaimed Waterline Environmental Assessment and Section 106 Consultation Invitation for Nellis Air Force Base

Dear Ms. Palmer,

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the SHPO may have an interest; and to invite the SHPO to participate in government-to-government consultation with Nellis Air Force Base (AFB) pursuant to Section 106 of the National Historic Preservation Act. [1]

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis AFB, Nevada. This EA will, as required by law and regulations, [2] consider the potential impacts resulting from the construction, installation, and maintenance of a reclaimed waterline at Nellis AFB, NV. The CNLV has identified Nellis AFB as the preferred alternative and eliminated further consideration of other installations using established criteria as permitted by 36 C.F.R. §989.8.

The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course. As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility (CNLV-WRF). The Area of Potential Effect (APE) is identified in Attachment 2. Utilizing reclaimed water for uses in which potable water is not necessary, such as irrigation for landscaping, will reduce the rate of aquifer depletion in the Las Vegas area, and allow more potable water to be available for applications in which it is necessary.

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[1] 54 U.S.C. § 306108, as implemented by 36 CFR Part 800.
[2] National Environmental Policy Act (NEPA) of 1969 [42 U.S.C. §§4321 *et seq.*]; Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA 40 CFR Parts 1500-1508; and Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (32 CFR Part 989),

Please let my point of contact provided below on any issues or concerns for the SHPO in the development of this NEPA analysis and completion of the Section 106 consultation. At this time, Nellis AFB does not know of any properties of religious and cultural significance within the APE. Nevertheless, we ask for your assistance in identifying such properties of which we may be unaware, particularly those that may be affected by this proposal.

For staff questions, comments, or input on the NEPA process, please contact Mr. Tod Oppenborn, Nellis AFB NEPA Program Manager, tod.oppenborn@us.af.mil, (702) 652-9366. For matters related to the Section 106 process, you may contact Ms. Kish Lapierre, Nellis AFB Base Cultural Resources Program Manager, kish.lapierre@us.af.mil, (702) 652-5813. Please let us know if you have interest in consulting about the proposal and I look forward to receiving any input you may have regarding this endeavor.

Respectfully,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Project Location Map

cc: Allan Fajardo
Nellis Affiliated Tribes

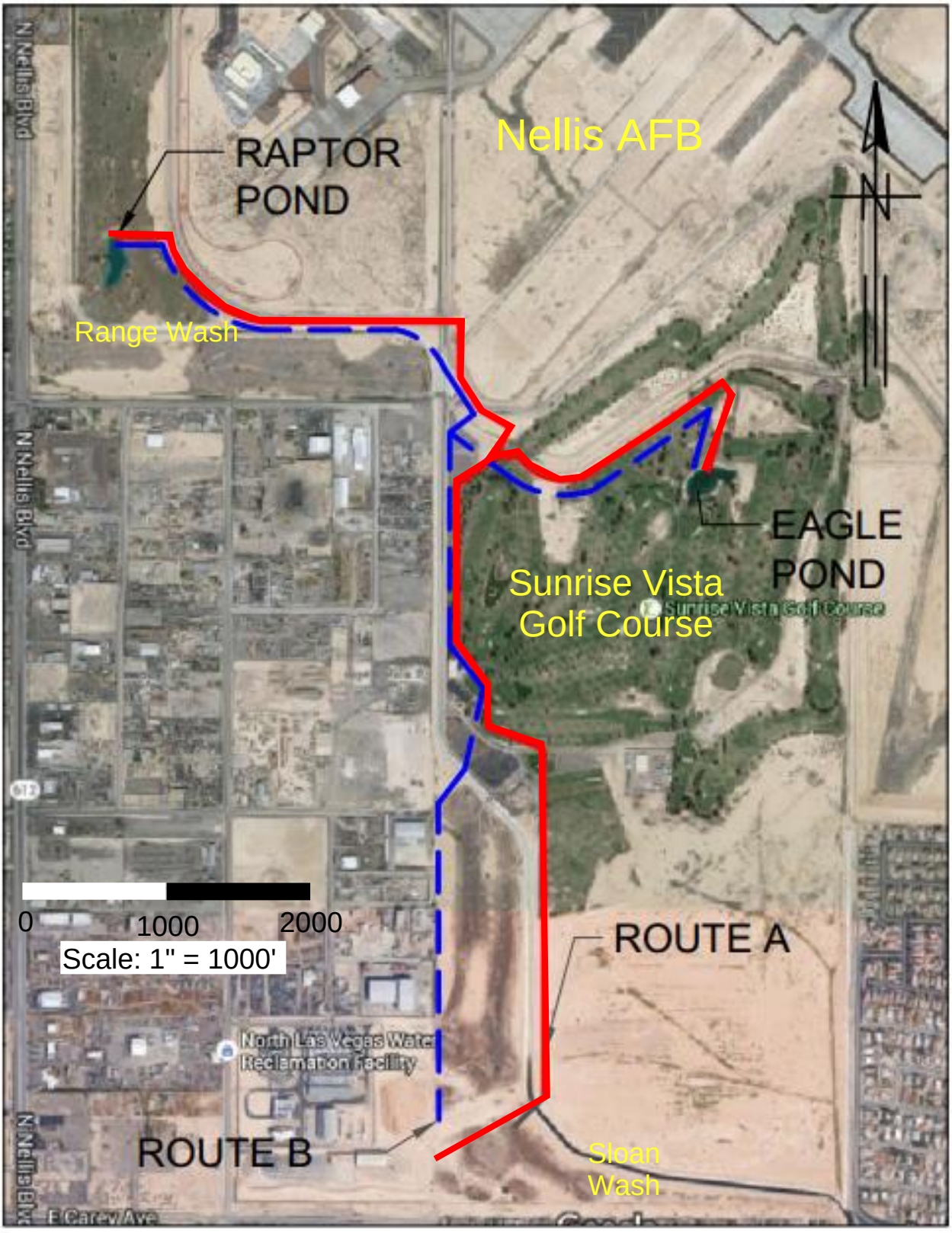

Figure 1: Alternatives proposed for the reclaimed water line from CNLV-WRF to Nellis AFB Golf Course.

PIPE ALIGNMENT MAP

SCALE: 1" = 1000'

LEGEND
APE's/ROUTE

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

MAR 0 1 2017

Ms. Jennifer Olsen
Southern Nevada Regional Planning Coalition
240 Water Street, Mail Stop 115
Henderson, NV 89009

Dear Ms. Olsen,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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CHARLES W. ROWLAND JR.
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Pipe Alignment Map

cc: Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

MAR 0 1 2017

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191-6520

Mr. Dan Balduini
U.S. Fish and Wildlife Service
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502

Dear Mr. Balduini,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for the Proposed City of North Las Vegas (CNLV) Reclaimed Waterline at Nellis Air Force Base (AFB), Nevada. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between CNLV and the USAF, in which a reclaimed water line must be constructed to irrigate the Sunrise Vista Golf Course (SVGC). As part of the EULA, Nellis AFB has provided land for the construction of a treatment facility, identified as the City of North Las Vegas Water Reclamation Facility.

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CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
Pipe Alignment Map

cc: Allan Fajardo, CNLV

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Director
Las Vegas Library
Reference Department
833 Las Vegas Boulevard North
Las Vegas, NV 89101

Dear Sir or Madam,

Please find the enclosed copy of the draft Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

In addition to the proposed action, the draft EA assesses various Alternatives as well as the No Action Alternative. The primary alternative would allow the CNLV to fulfill the conditions of the Enhanced Use Lease (EUL) between Nellis AFB and the City of North Las Vegas (CNLV), in which the United States Air Force (USAF) allowed CNLV to construct the CNLV-WRF on land leased from Nellis AFB. Per this agreement, CNLV-WRF is commissioned to deliver reclaimed water back to Nellis AFB for uses in which non-potable water is suitable.

In accordance with 32 CFR 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR 1500-1508, the Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act, as amended, Nellis AFB requests libraries file this document for public access and reference. Thank you for your participation in the EIAP for this action.

Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Bob Ross, Field Manager
Bureau of Land Management, Las Vegas Field Office
4701 North Torrey Pines Dr.
Las Vegas, NV 89130

Dear Mr. Ross,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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In accordance with 32 CFR 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR 1500-1508, the Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act, as amended, Nellis AFB requests that your agency review the environmental assessment. Please send any comments no later than December 1, 2017 to Mr. Tod Oppenborn at the above address or email him at tod.oppenborn@us.af.mil. Thank you for your participation.

Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Chairperson Steve Sisolak
Clark County Commission
500 Grand Central Parkway
Las Vegas, NV 89109

Dear Chairperson Sisolak,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. John Mendoza, Senior Planner
Clark County Department of Air Quality & Environmental Management
500 S. Grand Central Parkway
P.O. Box 555210
Las Vegas, NV 89155

Dear Mr. Mendoza,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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In accordance with 32 CFR 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR 1500-1508, the Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act, as amended, Nellis AFB requests that your agency review the environmental assessment. Please send any comments no later than December 1, 2017 to Mr. Tod Oppenborn at the above address or email him at tod.oppenborn@us.af.mil. Thank you for your participation.

Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ms. Carolyn Edwards, Trustee, District F
Clark County School District
5100 W. Sahara Avenue
Las Vegas, NV 89146

Dear Ms. Edwards,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Gregory Blackburn, Director
City of North Las Vegas, Community Development
Planning and Zoning Division
2200 Civic Center Drive
Las Vegas, NV 89030

Dear Mr. Blackburn,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Shaun Sanchez
US Fish and Wildlife Service
Desert National Wildlife Refuge Complex
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130

Dear Mr. Sanchez,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Michael Senn, Asst. Field Supervisor
US Fish and Wildlife Service
Southern Nevada Fish and Wildlife Office
4701 N. Torrey Pines Dr.
Las Vegas, NV 89130

Dear Mr. Senn,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Dan Balduini
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502

Dear Mr. Balduini,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ms. Jennifer Newmark
Nevada Natural Heritage Program
901 S. Stewart St., Suite 5002
Carson City, NV 89701

Dear Ms. Newmark,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. George Tsukamoto, Interim Director
Nevada Department of Wildlife – Headquarters
1100 Valley Road
Reno, NV 89512

Dear Mr. Tsukamoto,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. D. Bradford Hardenbrook, Supervisor Habitat Biologist
Nevada Department of Wildlife – Southern Region
4747 Vegas Drive
Las Vegas, NV 89108

Dear Mr. Hardenbrook,

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Chief, Portfolio Optimization

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Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Jacob Snow, General Manager
Regional Transportation Commission of Southern Nevada
600 S. Grand Central Parkway, Suite 350
Las Vegas, NV 89106

Dear Mr. Snow,

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Martyn James, Director of Planning Services
Regional Transportation Commission of Southern Nevada
600 S. Grand Central Parkway, Suite 350
Las Vegas, NV 89106

Dear Mr. James,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at the City of North Las Vegas – Water Reclamation Facility (CNLV-WRF), and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of Sunrise Vista Golf Course (SVGC). It is proposed in this project that the water be used to irrigate the Nellis AFB SVGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ms. Jennifer Olsen
Southern Nevada Regional Planning Coalition
240 Water Street, Mail Stop 115
Henderson, NV 89009

Dear Ms. Olsen,

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Jarrod Edmunds, Special Projects Office Leader
USDA Natural Resource Conservation Service
Las Vegas Service Center
5820 S. Pecos Road, Bldg. A, Suite 400
Las Vegas, NV 89120

Dear Mr. Edmunds,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Mr. Bruce Peterson, State Conservationist
USDA Natural Resource Conservation Service
Nevada State Office
1365 Corporate Blvd.
Reno, NV 89502

Dear Mr. Peterson,

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Chief, Portfolio Optimization

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Allan Fajardo, CNLV

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99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Benton Paiute Tribe
Tina Braithwaite, Chairperson
Utu Utu Gwaitu Paiute Tribe
25669 Highway 6, PMB I
Benton, CA 93512

Dear Ms. Braithwaite,

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In accordance with 32 CFR 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR 1500-1508, the Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act, as amended, Nellis AFB requests that your agency review the environmental assessment. Please send any comments no later than October 1, 2017 to Mr. Tod Oppenborn at the above address or email him at tod.oppenborn@us.af.mil. Thank you for your participation.

Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Big Pine Paiute Tribe
Ms. Shannon Romero, Chairperson
P.O. Box 700
825 South Main Street
Big Pine, CA 93513

Dear Ms. Romero,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Bishop Paiute Tribe
Mr. Gerald Howard, Chairperson
50 Tusu Lane
Bishop, CA 93514

Dear Mr. Howard,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Mr. Raymond Andres, Bishop Paiute Tribe

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Bishop Paiute Tribe
Mr. Raymond Andrews
50 Tusu Lane
Bishop, CA 93514

Dear Mr. Andrews,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Mr. Gerald Howard, Chairperson, Bishop Paiute Tribe

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Chemehuevi Indian Tribe
Charles Wood, Chairperson
P.O. Box 1976
Havasu Lake, CA 92363

Dear Mr. Wood,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Colorado River Indian Tribes
Dennis Patch, Chairperson
26600 Mohave Road
Parker, AZ 85344

Dear Mr. Patch,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Duckwater Shoshone Tribe
Rodney Mike, Chairperson
511 Duckwater Falls, P.O. Box 140068
Duckwater, NV 89314-0068

Dear Mr. Mike,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

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Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ely Shoshone Tribe
Victor McQueen Jr., Chairman
16 Shoshone Circle
Ely, NV 89301

Dear Mr. McQueen,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Chief, Portfolio Optimization

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cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ft. Independence Paiute Tribe
Mr. Norman Wilder, Chairperson
P.O. Box 67
131 North Hwy 395
Independence, CA 93526

Dear Mr. Wilder,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Ft. Mojave Tribe
Timothy Williams, Chairperson
500 Merriman Avenue
Needles, CA 92363

Dear Mr. Williams,

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Chief, Portfolio Optimization

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cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Kaibab Band of Southern Paiutes
Roland Maldonado, Chairperson
HC 65 Box 2
Fredonia, AZ 86022

Dear Mr. Maldonado,

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CHARLES W. ROWLAND, Jr
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Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Las Vegas Paiute Tribe
Benny Tso, Chairperson
#1 Paiute Drive
Las Vegas, NV 89106

Dear Mr. Tso,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Lone Pine Paiute-Shoshone Tribe
Ms. Mary Wuester-Chairperson
P.O. Box 747
975 Teya Road
Lone Pine, CA 93545

Dear Ms. Wuester,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Ms. Janice Aten-Environmental Director

Enable Success Through Innovative Base Support

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Lone Pine Paiute-Shoshone Tribe
Ms. Janice Aten-Environmental Director
P.O. Box 747
975 Teya Road
Lone Pine, CA 93545

Dear Ms. Aten,

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CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Ms. Mary Wuester, Chairperson, Lone Pine Paiute-Shoshone Tribe

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Moapa Band of Paiutes
Darren Daboda, Chairperson
P.O. Box 340
Moapa, NV 89025

Dear Mr. Daboda,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

In addition to the proposed action, the draft EA assesses various Alternatives as well as the No Action Alternative. The primary alternative would allow the CNLV to fulfill the conditions of the Enhanced Use Lease (EUL) between Nellis AFB and the City of North Las Vegas (CNLV), in which the United States Air Force (USAF) allowed CNLV to construct the CNLV-WRF on land leased from Nellis AFB. Per this agreement, CNLV-WRF is commissioned to deliver reclaimed water back to Nellis AFB for uses in which non-potable water is suitable.

In accordance with 32 CFR 989, the Air Force Environmental Impact Analysis Process (EIAP), and 40 CFR 1500-1508, the Council on Environmental Quality guidelines, pursuant to the National Environmental Policy Act, as amended, Nellis AFB requests that your agency review the environmental assessment. Please send any comments no later than December 1, 2017 to Mr. Tod Oppenborn at the above address or email him at tod.oppenborn@us.af.mil. Thank you for your participation.

Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Pahrump Paiute Tribe
Richard Arnold
P.O. Box 3411
Pahrump, NV 89041

Dear Mr. Arnold,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Timbisha Shoshone Tribe
Mr. George Gholson, Tribal Chairperson
621 West Line St. Suite 109
Bishop, CA 93515

Dear Mr. Gholson,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Ms. Barbara Durham

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Timbisha Shoshone Tribe
Ms. Barbara Durham
PO Box 358
Death Valley, CA 92328

Dear Ms. Durham,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV
Mr. George Gholson, Tribal Chairperson, Timbisha Shoshone Tribe

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Paiute Indian Tribes of Utah
Tamra Borchardt-Slayton, Chairperson
440 North Paiute Drive
Cedar City, UT 84721

Dear Mrs. Borchardt-Slayton,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

99 CES/CENP
6020 Beale Ave.
Nellis AFB, NV 89191

Yomba Shoshone Tribe
Wayne Dyer, Chairperson
Daryl Brady, Vice-Chairperson
HC 61, Box 6275
Austin, NV 89310

Dear Mr. Dyer,

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) to evaluate the potential impacts, beneficial and adverse, resulting from the construction and maintenance of a new reclaimed waterline on Nellis Air Force Base (AFB) in Clark County, Nevada. The Proposed Action is to construct and maintain approximately 12,100 lineal feet of 10-inch diameter PVC reclaimed water main. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. It is proposed in this project that the water be used to irrigate the NAGC, allowing for its continued operation.

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Respectfully,

CHARLES W. ROWLAND, Jr
Chief, Portfolio Optimization

Attachments:
Draft Environmental Assessment Nellis AFB Reclaimed Water Line and FONSI

cc:
Allan Fajardo, CNLV

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Appendix B

Geotechnical Report

GEOTECHNICAL EVALUATION
NELLIS RECLAIMED WATERLINE PROJECT
NELLIS AIR FORCE BASE, NEVADA

Project No. 20153828E1
June 24, 2016

Prepared for:

GREELEY AND HANSEN

1120 N. Town Center Drive, Suite 1120
Las Vegas, Nevada 89144

Prepared by:

GES
Geotechnical & Environmental Services, Inc.
7150 Placid Street
Las Vegas, Nevada 89119

GES
GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.
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June 24, 2016
Project No. 20153828E1

Mr. John Michael Gonzales, EI
Greeley and Hansen
1120 North Town Center Drive, Suite 1120
Las Vegas, Nevada 89144

RE: Geotechnical Evaluation
Nellis Reclaimed Waterline Project
Southwestern Area of Nellis Air Force Base
Clark County, Nevada

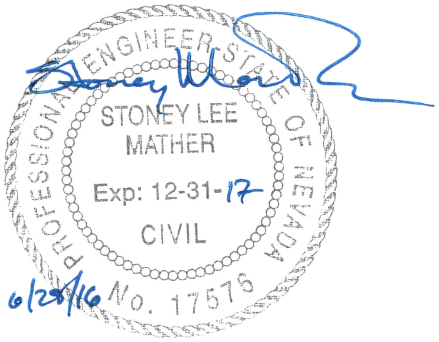
Dear Mr. Gonzales:

Geotechnical & Environmental Services, Inc. (GES) is pleased to present this Geotechnical Evaluation Report for the Nellis Reclaimed Waterline Project, which is located in an existing utility corridor in the southwestern portion of Nellis Air Force Base (AFB) within Clark County, Nevada.

This Geotechnical Evaluation Report includes information regarding geology, encountered subsurface materials and conditions along the proposed alignment, and laboratory test results including backfill suitability of sampled native materials.

We appreciate this opportunity to provide our professional services. If you have any questions or comments regarding this information, please feel free to contact our office.

Sincerely,
Geotechnical & Environmental Services, Inc.



David Tang, P.E.
Project Engineer

Stoney L. Mather, P.E.
Project Engineer

DT:SLM:caw

Dist: 5 originals to addressee
PDF copy emailed to addressee at jgonzalez@greeley-hansen.com
Copy to project File

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APPENDIX B – LABORATORY TEST RESULTS
APPENDIX C – DESIGN FIGURES

GEOTECHNICAL EVALUATION
NELLIS RECLAIMED WATERLINE PROJECT
NELLIS AIR FORCE BASE, NEVADA

1. INTRODUCTION

Geotechnical & Environmental Services, Inc. (GES) is pleased to provide this report presenting the findings of a field exploration program and laboratory testing for the Nellis Reclaimed Waterline project, which is located in an existing utility corridor in the southwestern portion of Nellis Air Force Base (AFB) in Clark County, Nevada. Figure A-1 presents a vicinity map showing the approximate location of the project within the Las Vegas Valley. The following sections present the purpose and scope of our geotechnical evaluation, and project and alignment descriptions.

1.1. PURPOSE

The purpose of this geotechnical evaluation report is to provide subsurface geotechnical information for this project. The scope of our geotechnical study included a review of referenced documents and geologic data, subsurface explorations, soil sampling, laboratory testing of selected soil samples, and preparation of this report. In this regard, the report provides information concerning:

- Regional and alignment geology
- Subsurface soil and groundwater conditions encountered in our borings
- Results of laboratory testing

1.2. PROJECT DESCRIPTION

Our understanding of the project is based on review of aerial photographs, correspondence with Greeley and Hansen personnel and our experience with similar projects in the vicinity.

The project will involve the design and construction of a reclaimed water pipeline, through which the reclaimed water from the CNLV Water Treatment Plant is going to be transferred and used as irrigation water for the Nellis AFB golf course. The project pipeline alignment is located in the southwestern portion of Nellis AFB, which includes approximately 160 acres of USAF property located at the base. The project alignment extends through parcels that are currently developed, with an area near the southern portion of the alignment functioning as a closed and capped landfill on the east side of Sloan Channel. The project alignment also extends through a closed section of the golf course west of Sloan Channel.

As part of a previously negotiated Enhanced Use Lease (EUL) with the City of North Las Vegas (CNLV), the United States Air Force (USAF) allowed the CNLV to construct a water reclamation facility on land leased from Nellis AFB. The initial plan for the water reclamation facility is capable of treating 20 million gallons of wastewater a day, with options to upgrade the facility to 50 million gallons a day. This plan includes a closed and secured facility, with most of the project's structures below or close to ground level. Water from the treatment facility would be supplied to Nellis AFB, primarily for irrigation of the Nellis AFB golf course area, as well as for other non-potable uses on the base. In order to use this water on the base, the USAF proposed that a pipeline be built from the treatment facility to points on base where it could be utilized. To minimize the footprint disturbed by construction, the pipeline is planned to be built along the same utility corridor as was previously constructed for the electric conduits from photovoltaic stations on near the alignment.

1.3. ALIGNMENT DESCRIPTION

The water pipeline that is the subject of this study is designed to be approximately 10,000 feet long, and includes a 10-inch diameter reclaimed water main, extending between the water reclamation facility near the southwest side of Nellis AFB and irrigation ponds on the Nellis AFB golf course. The alignment extends through developed areas, crosses beneath a concrete-lined trapezoidal channel, and connects water hazards used for water storage and irrigation of the Nellis AFB golf course.

2. DISCUSSION

The following sections provided descriptions of regional geology, seismicity, liquefaction, mapped soil conditions, field exploration, subsurface materials and conditions, laboratory testing, and trench backfill suitability for the project.

2.1. REGIONAL GEOLOGY

The subject alignment is located within the Las Vegas Valley, a fault-bounded graben structure surrounded by mountain ranges. The Las Vegas Valley is physiographically characteristic of the Basin and Range Province with generally northwest-trending parallel mountain ranges and an intervening basin. Unlike many basins within the Basin and Range Province which are internally draining, the Las Vegas Valley is unique in that the basin drains through the Las Vegas Wash to Lake Mead and the Colorado River.

Tertiary and Quaternary unconsolidated alluvial deposits, derived from the surrounding mountain ranges, fill the valley. These deposits may be up to 4,000 feet thick near the center of the valley. The surrounding mountain ranges are comprised of sedimentary and igneous rocks. Alluvial fan deposits, consisting of sand and gravel, slope down from the mountain fronts towards the valley floor. Sediments are typically less coarse, grading from fine sand and silt to clay near the valley bottom. Beds of amorphous and crystalline gypsum are common. Zones of calcareous cemented deposits (caliche) are present at various locations and depths throughout the valley.

Caliche deposits are the results of various geologic processes over time. Infiltration of precipitation in the mountains to the north and west recharges the underlying aquifers within the Las Vegas Valley. These stacked aquifers are separated by layers of confining, fine-grained lacustrine deposits, building pressures that are ultimately released along faults and fractures where groundwater migrates to, or near to, the surface where high rates of evapotranspiration remove the water from the ground, leaving calcium carbonate sediments in the soil. Fluctuating water level within the capillary fringe zone of the unconfined aquifer results in differential cementation of receptive soil types.

The subject project is located within areas described on the referenced Geologic Map of the Las Vegas Northeast Quadrangle, Las Vegas, Nevada (Matti et. al., 1985). As described on the referenced map, the project alignment extends through four mapped geologic units (QTs, Qa, Qai, and Qoa). The four units of geologic deposition include alluvial deposits from active and intermittent washes, older alluvium of Red Rock fan and Las Vegas Wash, and fluvial deposits. Local carbonate cementation is characteristic of the Qa, Qai, and Qoa units. Geologic units, through which the alignment extends are shown on Figure A-2a, in Appendix A of this report.

2.2. SEISMICITY

The U.S. National Oceanic and Atmospheric Administration Earthquake Catalog lists about 800 events of magnitude greater than or equal to 4.0 with epicenters within about 120 miles of Las Vegas. Only 19 events greater than or equal to magnitude 4.0 are estimated to have occurred during the 1881 through 1938 period in the southern Nevada region.

After about 1947, nuclear testing began at the Nevada Test Site. Accordingly, many of the recorded earthquakes after about 1947 may be due to nuclear blasts occurring more than about 60 miles from the project alignments. Several hundred earthquakes occurred from 1936 to 1965 near Hoover Dam, presumably due to filling of the Lake Mead reservoir, with 24 of these events reportedly greater than or equal to magnitude 4.0.

Based on a review of referenced geologic maps and literature, the nearest Quaternary-age (last 1.6 million years) fault is located approximately one mile west of the alignment (dePolo and Bell, 2000). Other mapped Quaternary-age tectonic faults are the Eglington fault, which geologists have debated may also be potentially active, and Frenchman Mountain fault located approximately seven miles northwest and 2-1/2 miles southeast of the alignment, respectively. The nearest mapped Holocene active fault (i.e., a fault that has moved within the last 10,000 years) is the Black Hills fault, located approximately 19 miles south of the project alignment. Based on the results of our review of available literature, mapped faults do not cross the proposed alignment.

Earth fissure zones have developed across the Las Vegas Valley, and are generally attributed to subsidence related to overdrafting of local groundwater aquifers. Many of these earth fissure zones are in close proximity to mapped faults of the Las Vegas Valley fault system. No indications of earth fissures were observed along the project alignment at the boring locations during the field evaluation; however, portions of the areas along the alignment have been disturbed by recent construction, including asphalt paving for roadway construction and earthwork for commercial and residential developments. The nearest mapped fissure zone is located about four miles west of the project alignment near North 5th Street and East Alexander Road (dePolo and Bell, 2000).

2.3. LIQUEFACTION

Liquefaction is a phenomenon in which loose, saturated soils lose shear strength under short-term (dynamic) loading conditions. Ground shaking of sufficient duration results in the loss of grain-to-grain contact in potentially liquefiable soils due to a rapid increase in pore water pressure, causing the soil to behave as a fluid for a short period of time. Liquefaction generally occurs in soil layers located within 50 feet of the ground surface.

To be potentially liquefiable, a soil is typically cohesionless with a grain-size distribution generally consisting of sand and silt. It is generally loose to medium dense and has a relatively high moisture content, which is typical near or below groundwater level. The potential for liquefaction decreases with increasing clay and gravel content, but increases as the ground acceleration and duration of shaking increase. Potentially liquefiable soils need to be subjected to sufficient magnitude and duration of ground shaking for liquefaction to occur. Effects of liquefaction can include relatively large total and differential settlements, flotation of subsurface structures, slope failures, lateral ground displacements (lateral spreading), surface subsidence, ground cracking, and sand boils.

An in-depth evaluation of the potential for liquefaction along the project alignment may be needed, based on the potential for liquefaction (evaluated during an initial screening), the requirements of the governing agency, or as requested to help the property owner evaluate potential risks associated with the project.

2.4. MAPPED SOIL CONDITIONS

Based on review of the Clark County Soil Guidelines Map (CCBD, 1998), the project alignment lies within locations previously mapped as Special Geotechnical Consideration Areas with potential drainage or recent sediment deposits and solubility, clay swell, corrosion, gypsum salt, expansive or hydro-collapsible potential. Based on review of the Clark County Expansive Soil Guidelines Map (CCDDS, 2006), portions of the alignment are within locations previously mapped as areas having soil with up to moderate swell potential (less than 8 percent).

2.5. FIELD EXPLORATION

GES evaluated the subsurface conditions along the proposed project alignment on June 2, and June 3, 2016 to depths of between approximately 10 and 25 feet below the existing ground surface.

Where borings were located in paved ROW, asphalt concrete pavements were cored with a 12-inch diameter core barrel prior to advancing the borings. When borings were located near marked utilities, each boring excavation was potholed with a truck-mounted vacuum extractor (air-knife) to a depth of approximately 5 feet in order to evaluate potential conflicts with near-surface utility lines. Figure A-2 shows the approximate boring locations along the project

alignment. Boring coordinates were recorded by GES staff using a hand held GPS unit and are provided on the exploration logs in Appendix A.

GES engineering staff directed the subsurface exploration team while maintaining detailed logs of the subsurface conditions, classifying the soils encountered, and obtaining soil samples. The soils encountered were classified in general accordance with the Unified Soil Classification System (USCS). A Key to Symbols and Terms utilized on the exploration logs are presented on Figure No. A-3. The exploration logs are presented on Figures A-4 through A-10.

The borings were drilled with a Diedrich D-120 truck-mounted drill rig using 6-inch nominal outside diameter hollow stem augers. Driven soil samples and penetration blow counts were obtained with a 3-inch outside diameter ring-lined drive sampler (modified split-spoon sampler) in general accordance with ASTM D3550. Standard penetration tests (SPT) were also performed using a 2-inch outside diameter split-spoon sampler in general accordance with ASTM D1586. The samplers were driven with a 140-pound automatic trip hammer falling approximately 30 inches. The penetration resistance measured by driving the sampler was used to evaluate consistency of the encountered soil. Bulk soil samples were also obtained at selected depths. The boreholes were backfilled with soil cuttings.

2.6. SUBSURFACE MATERIALS AND CONDITIONS

The following sections describe fill materials and native soils encountered in exploratory borings performed for this study. Detailed information regarding subsurface materials and conditions are presented on the boring logs in Appendix A.

2.6.1. FILL MATERIALS

Fill was encountered in our explorations and noted on the boring logs to consist primarily of moist, brown, medium dense to dense clayey sand up to one foot thick. Additional fill materials may exist between and beyond the explorations performed and, due to prior development in the area, extend to depths deeper than those noted in the boring logs. Fill placed without documentation to indicate that the fill soils were placed under the supervision of a Geotechnical Engineer are considered uncontrolled. The term uncontrolled fill soils refers to artificial fill which was placed without engineering observation, testing, or documentation and is considered unsuitable for the support of project improvements. Our scope did not include an evaluation of existing fill soils or certification of existing fill or improvements.

2.6.2. NATIVE SOILS

The native soils encountered in the borings consisted primarily of layers of fine grained soils composed of relatively dry to moist sandy lean clays with varying amounts of gravel. Some interbedded layers of coarse-grained material composed of very dense clayey sand with gravel were also encountered in the borings.

Weakly to moderately cemented soils, and medium hard to very hard, strongly cemented soils were not encountered in the borings. Weakly and moderately cemented soil refers to cemented soil that can be crumbled or broken with little or considerable finger pressure, respectively. Strongly cemented soil, however, refers to rock-like soil that will not crumble or break at any finger pressure. In general, very dense or weakly to moderately cemented soils can be excavated with a backhoe and medium hard cemented soils can be excavated with a ripper tooth or by a backhoe with extreme difficulty. However, to excavate hard to very hard cemented rock-like materials, a heavy duty excavator or trencher, Caterpillar D-10 Dozer or larger (or equivalent), ripper, hoe-ram, headache ball, rock-saw or similar rock excavation techniques are anticipated to be needed. Where thick layers of very hard cemented materials are to be excavated, blasting is sometimes needed for removal. Due to the inconsistent nature of cemented soils, hard to very hard and difficult-to-excavate cemented soils could be encountered beyond or between exploratory boring locations at varying depths.

Medium (or moderately) hard cemented soils can be readily scratched by a knife blade and the scratching leaves a heavy trace of dust that reveals a readily-visible scratch when the powder is blown away. Hard cemented soils can be scratched with difficulty and may only be faintly visible with traces of the knife steel on the surface. Very hard cemented soil cannot be scratched with a pocket knife and knife steel marks are often left on the surface.

2.6.3. GROUNDWATER

Groundwater was not encountered in our borings during the field exploration. A review of water wells listed on the State of Nevada Department of Conservation & Natural Resources, Division of Water Resources website indicates that historical groundwater level in the vicinity of the alignment was measured at an elevation as shallow as approximately 55 feet below the ground surface (Well Log No. 117195, measured in 2013).

Groundwater levels should be anticipated to fluctuate due to seasonal precipitation, groundwater withdrawal and recharge, irrigation practices, and potential future dewatering efforts within and/or near the subject alignment. A detailed evaluation of possible groundwater fluctuations is beyond the scope of this study.

2.7. LABORATORY TESTING

The laboratory testing program included tests to aid in the classification of onsite soils and to evaluate engineering and physical properties of the tested materials. Laboratory test results are presented on the boring logs in Appendix A and on test reports presented in Appendix B. Detailed descriptions of the laboratory tests performed are also presented in Appendix B. A summary of selected laboratory test results is provided in the table below.

Table 2.7. Summary of Selected Laboratory Test Results

Test	Test Results	Notes
Atterberg Limits Liquid Limit Plastic Limit Plasticity Index	 No value to 34 Non-plastic to 18 Non-plastic to 20	Low to medium plasticity
Moisture content	2.8 to 33.7 percent	--
Dry density	67.0 to 102.7 pounds per cubic foot	--
Material passing #200 sieve	54 to 82 percent	--
Swell potential	0 to 2 percent	Low swell potential
Maximum Dry Density and Optimum Moisture	95.5 pcf at 18 percent and 115 pcf at 14 percent	--
Sodium Content	0.07 to 0.12 percent	--
Sulfate Content	0.01 to 0.02 percent	Negligibly deleterious to concrete
Sodium Sulfate Content	0.01 to 0.03 percent	Low chemical heave (salt heave) potential
Total Salts (Solubility)	0.14 to 0.31 percent	Low solubility potential
Sulfide	<1.0 mg/kg	Low corrosion potential
pH	8.57 to 9.03 S.U.	--
Reduction-oxidation	242 to 404 mV	--
Chloride Content	34.3 to 695 mg/kg	Potentially corrosive to metal
Resistivity	265 to 617 Ohm-cm	Severely to very severely corrosive to steel

2.8. TRENCH BACKFILL SUITABILITY

GES evaluated the suitability of soils collected from the borings for use as Selected Backfill and Granular Backfill, as specified in Section 207.02.01 and Section 207.02.02, respectively, of the USS. Specifications for gradation and plasticity, results of laboratory tests, and an evaluation of suitability are provided in the following tables.

Table 2.8-1. Trench Backfill Suitability

			Percent Passing by Weight													
			Sieve Size													
			6-inch		3-inch		No. 4		No. 16		No. 200		Plasticity Index*	Liquid Limit**	Meets Select Backfill Requirement?	Meets Granular Backfill Requirement?
Boring	Depth (ft)	USCS	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max				
Select Backfill			**100**	**100**	**80**	**100**	**35**	**100**	**--**	**--**	**--**	**--**	**Table 2.8-2**	**50 max**	**Yes**	**--**
Granular Backfill			**--**	**--**	**100**	**100**	**35**	**100**	**25**	**100**	**5**	**15**	**Table 2.8-3**	**--**	**Yes**	**Yes**
B-1	10.0-11.5	CL	100		100		100		99		65		19	35	No	No
B-2	2.0-5.0	CL	100		100		100		99		82		17	34	No	No
B-3	2.0-5.0	CL	100		100		83		81		60		20	34	No	No
B-4	2.0-5.0	CL	100		100		100		100		78		8	26	No	No
B-5	2.0-5.0	CL	100		100		100		99		68		14	30	No	No
B-7	2.0-5.0	CL	100		100		94		89		54		14	30	No	No

* NP Indicates Non-plastic
**NV indicates No Value

Table 2.8-2. Maximum Plasticity Index for Select Backfill

Percent by Weight Passing No. 200 Sieve	Maximum Plasticity Index
0-10.0	15
10.1-20.0	12
20.1-50.0	10
50.1-80.0	8
81.1-100.0	6

Table 2.8-3. Maximum Plasticity Index for Granular Backfill

Percent by Weight Passing No. 200 Sieve	Maximum Plasticity Index
0.1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.1 to 11.0	4
11.1 to 15.0	3

3. FINDINGS

Based on the results of our field exploration and laboratory testing programs, it is our opinion that there are no known geologic or geotechnical conditions that would preclude the design and construction of proposed project improvements. It is also our opinion that there are some geotechnical considerations that may affect design and construction of project elements. The most significant geotechnical considerations are described below:

- Based on the results of laboratory testing, tested native soils generally do not meet the USS requirements for Selected Backfill or for Granular Backfill. Soils proposed for trench backfill should be sampled and evaluated by the geotechnical consultant before backfilling.
- Based on review of the Clark County Seismic Shear Wave Velocity Map, the project alignment is located in an area previously mapped by Clark County as a Seismic Site Class D (GISMO, 2008). In accordance with section 1613.5.2 of the 2012 IBC (ICC, 2012), Seismic Site Class D is recommended for the project.
- Fill materials were encountered in our subsurface explorations, and should be anticipated in existing roadway and utility trench areas. Documentation indicating placement and compaction of the fill encountered was not available for review as part of our study. These materials should be considered uncontrolled fill unless documentation of their placement and compaction is provided. The term uncontrolled fill refers to man-made fill which was placed without engineering observation, testing, or documentation and is considered unsuitable to support project structures in its present condition. An evaluation of onsite fill soils is beyond the scope of this evaluation.
- Oversize material (e.g. material larger than 3 inches in nominal diameter) may be produced when excavating cemented materials. Oversize materials will need to be processed to meet the recommendations for structural fill provided in this report before being suitable for use in structural areas. Alternately, oversize materials may be hauled away for disposal.
- Based on the cohesive nature of the soils encountered, it is our opinion that the potential for distress resulting from liquefaction along the alignment is low. If needed, or at the request of the owner, hazards associated with liquefaction may be further evaluated with additional subsurface exploration and geotechnical analyses.
- Based on our review of referenced geologic data and the distance to mapped faults and fissures, it is our opinion that the potential for fault-related surface rupture along the alignment is negligible. Due to the relatively flat grades observed along the alignment, it is our opinion that the risk of slope instability is also low.
- Weakly to strongly cemented and very dense to very hard cemented rock-like soil (caliche) were not encountered during our field explorations. Due to the inconsistent nature of cemented soil zones, layers of cemented soil may be encountered at different depths and locations between and beyond our borings and at locations not explored as part of this study.
- Based on laboratory test results, tested samples of soils encountered in our explorations have low solubility. Blending of excavated onsite soils to reduce solubility is not anticipated for the excavated materials to be used as structural fill. Structural fill recommendations are provided in Section 4.1.5 of this report.
- The tested soils have low expansion potential as described in Section 1803.5.3.2 and Table 1808.6.1.1 of the SNA to the 2012 IBC (SNBO, 2013).
- Tested soils have a low chemical-induced heave potential.
- The tested soils have sulfate content considered to be negligibly deleterious to concrete. Recommendations for concrete are provided in Section 4.6 of this report.
- Some of the tested soil samples have soluble soil chloride content that is more than 500 parts per million (ppm), as evaluated by AWWA Standard Test Method SM4500-CI D. Blending of onsite soil to reduce chloride concentrations and/or other appropriate corrosion protection for project improvements may be needed.

4. RECOMMENDATIONS

The following sections present recommendations concerning the proposed reclaimed water pipeline. These recommendations are based upon our understanding of the project, the engineering properties of tested onsite soils, the geologic conditions presented in this report, and the assumption that an adequate number of tests and observations will be made during construction to evaluate compliance with these recommendations. Earthwork and subsurface preparation along the proposed alignment should be performed in general accordance with the requirements and specifications presented in this report, the USS, and the Design and Construction Standards (DACS) for Wastewater Collection Systems (CCWRD, 2009).

4.1. EARTHWORK IN ROADWAY ROW

Specifications for construction materials to be used and construction practices to be followed when excavating and backfilling trenches within paved and unpaved ROW are provided in the referenced USS (RTCSS, 2003).

The following subsections provide additional earthwork recommendations for the project including trench excavation, stability of temporary excavations, pipe bedding and pipe zone backfill, final trench backfill, structural fill, and import soils.

4.1.1. TRENCH EXCAVATION

Prior to trench excavation, the ground surface in proposed project improvement areas should be cleared of any surface and subsurface obstructions, pavement, debris, organics (including vegetation), and other deleterious material. Materials generated from clearing operations should be removed from the project area and legally disposed. Trenching in paved areas should conform to the USS (RTCSS, 2003).

Fill material was encountered to depths of up to approximately one foot in our exploratory borings. Contractors for this project should anticipate that fill will be encountered during excavation operations particularly in roadways and where existing underground utilities are located. The full depth of undocumented fill material and any loose, disturbed, or otherwise unsuitable soil should be removed from proposed improvement areas.

Layers of cemented soils (caliche) were not encountered in our exploratory borings; however, due to the variable nature of caliche and our previous experience in the project area, this rock-like cemented soil may be encountered along the project alignment in areas between and beyond our exploratory boring locations. When caliche is encountered, rock excavation techniques, such as use of heavy-duty ripping equipment, heavy-duty backhoe, headache ball, hoe-ram, etc., should be anticipated during earthwork operations. The contractor should be aware of the potential for (and take adequate precautions to reduce the potential for) vibrational damage to adjacent or nearby structures, and take appropriate precautions, when using heavy impact equipment during removal of caliche.

If caliche is encountered, contractors for this project should anticipate that oversize material (particles larger than 3 inches in diameter) will be generated during earthwork operations to excavate the encountered caliche. These oversize materials will need to be broken down/crushed prior to utilization as structural fill and backfill, or exported from the project area. Depending on whether oversize material is broken down/crushed and utilized for this project, import of soils for trench backfill may be needed.

Trench excavations for the pipeline should extend to the full depth and width, as specified in the project plans, or to a greater depth or width where needed, as evaluated in the field by the project's geotechnical consultant. Excavations should be wide enough to provide an adequate work zone and trenching for the pipeline should provide a 12 inch clearance on either side of the pipe for pipe zone material placement and compaction. The 12-inch side clearance should be the clear distance between the pipe and shoring system where present. Additional trench size information is provided in Section 208 of the referenced USS (RTCSS, 2003). Excavated onsite soils may be used as trench backfill and structural fill provided they are in accordance with the recommendations presented in this report and comply with the applicable material descriptions in the USS.

Consideration should be given to existing pipelines running parallel to the planned excavations. Trench excavations within two pipe diameters of existing pipelines and extending below the springline of, and running parallel to, existing pipeline utilities may need to be supported by properly designed trench shoring and bracing to prevent damage to existing pipeline facilities.

4.1.2. STABILITY OF TEMPORARY EXCAVATIONS

Based on the soil conditions encountered in our exploratory borings, instability of the trench walls should be anticipated during excavation operations for this project. Temporary excavations should be performed in accordance with the requirements and recommendations of the referenced Occupational Safety and Health Administration's Construction Industry Regulations (OSHA, 2005). Excavations deeper than 5 feet should be appropriately shored or laid back at a slope no steeper than 1:1 (horizontal to vertical) per OSHA recommendations. Onsite safety of personnel is the responsibility of the contractor. Worker protection, such as trench boxes, may be needed for protection against rolling or falling particles.

Excavations for the proposed pipeline are anticipated to be up to approximately 25 feet deep. Spoils from excavations, heavy construction equipment, and other surcharge loads should not be placed above the excavations within a 1:1 (horizontal to vertical) plane extending up and back from the base of the excavation. In addition, surface drainage should be channeled away from the top edge of excavations and traffic should be routed as far away from the excavation as practicable during construction.

As an alternative to laying back the sides of the excavations, temporary excavations may be rigidly braced. Temporary earth retaining systems will be subjected to lateral loads resulting from earth pressures. As a guideline, lateral earth pressures presented in this report may be used in the design of internally braced excavation shoring for temporary excavations. A structural engineer experienced in retaining systems for temporary excavations should be consulted by the contractor during the design of the shoring system. The project's geotechnical engineer should review the design plans for a temporary retaining system prior to its implementation.

4.1.3. PIPE BEDDING AND PIPE ZONE BACKFILL

Medium dense to very dense and firm to very stiff native soils, caliche, or adequately placed and compacted structural fill should provide suitable support for pipe bedding material. As described in Section 208.03.12 of the referenced USS (RTCSS, 2003), pipe bedding should consist of Type II Aggregate Base Backfill, controlled low-strength material (CLSM), or Type III Aggregate, as defined in Sections 208.02.05, 208.02.07, and 208.02.09 respectively, of the USS. The pipe bedding should be compacted to 90 percent relative compaction (AASHTO T180). The thickness of bedding material should be 4 inches or more.

The pipe zone consists of the area starting at the bottom of the pipe to a depth above the top of the pipe to meet the cover requirements in Section 208.03.19 of the referenced USS (RTCSS, 2003), as applicable. Pipe zone backfill should consist of CLSM, Type II Aggregate Base, or Type III Aggregate compacted to 90 percent relative compaction (AASHTO T180). If CLSM is selected for use as backfill, we recommend that CLSM with a unit weight of approximately 120 pounds per cubic foot be used unless additional consideration is given to pressures resulting from material with a higher unit weight.

Pipe bedding and pipe zone backfill soils should be densified by mechanical means. If the pipe manufacturer's recommendations for bedding or pipe zone backfill materials exceed USS standards, the manufacturer's recommendations should be followed. Care should be taken to avoid damage to the pipe during compaction operations.

Care should also be taken not to overexcavate trench bottoms during trenching. In the event that overexcavation occurs, the overexcavated area should be backfilled with CLSM or Type II Aggregate Base compacted to 90 percent relative compaction (AASHTO T180).

If the exposed surficial soils at the base of the pipeline trench are loose, soft, or disturbed by excavation operations, these soils should be moisture-conditioned to approximately optimum moisture content, and compacted to 90 percent relative compaction (AASHTO T180). Prior to placement of bedding material, the excavation bottom should be relatively smooth, and free of ponded water, saturated soils, loose or soft soils, soft or hard spots, large rocks, and foreign material.

4.1.4. TRENCH FINAL ZONE BACKFILL

Laboratory test results indicate that tested soils from our exploratory borings generally do not meet Clark County USS requirements for Selected Backfill or for Granular Backfill; however, according to Attachment A of the Interagency Quality Assurance Committee (IQAC) Material Qualification Procedures for Selected Backfill Material, material with a swell potential less than 12 percent and a minimum of 20 percent passing the #200 sieve may be used for trench backfill within City of North Las Vegas jurisdiction.

Excavated onsite soils may be used as trench final zone backfill provided the soils are free of organic matter, debris, other deleterious matter, and rocks or hard lumps larger than 3 inches in nominal diameter, and provided the soils meet the guidelines for Selected Backfill detailed in Section 207 of the referenced USS. These soils should also have a low solubility potential of 1.0 percent or less as evaluated by Technical Guideline TG-19-2007 (Clark County Development Services Department, 2007) and a low swell potential (in accordance with Section 1803.5.3.2 of the Southern Nevada Amendments to the 2012 IBC (SNBO, 2013). Alternately, within City of North Las Vegas areas, trench final zone backfill may meet the IQAC swell potential and gradation requirements for selected backfill material for City of North Las Vegas areas.

Placement and compaction of the trench backfill should be performed in general accordance with USS requirements. Backfill should be moisture-conditioned to approximately optimum moisture content and compacted to a relative compaction of 90 percent (AASHTO T180). Compaction of trench backfill material should be performed by mechanical means in order to achieve the desired results; flooding or jetting should not be allowed. The optimum lift thickness of backfill will depend on the type of compaction equipment used, but should generally not exceed 8 inches in loose thickness.

As an alternative to utilizing excavated material generated from excavations for this project as backfill, CLSM may be used as trench backfill. CLSM with a unit weight of approximately 120 pounds per cubic foot should be used if CLSM is selected for use as trench backfill material. Earthwork operations should be observed and placement of CLSM and/or compaction of backfill should be observed and tested by the project's geotechnical consultant.

Portions of the proposed pipeline will be constructed in areas of existing roadway pavement and other portions will be constructed in areas of unpaved roadway ROW. Drawing No. 503AF of the Uniform Standard Drawings (USD) for Public Works Construction (Clark County 2001) indicates that for currently paved areas where pipeline trench that is 36 inches in width or less is located within roadway ROW 60 feet wide or more and less than 80 feet wide (minor collector roadways), the upper 12 inches of trench backfill should consist of CLSM. In currently paved areas where the roadway ROW is 80 feet wide or more (major collector and arterial roadways), the upper 24 inches or more of trench backfill should consist of CLSM. In unpaved areas, the

upper 24 inches of trench backfill should consist of Type II Aggregate Base compacted to 90 percent relative compaction (ASTM D 1557), or CLSM.

4.1.5. STRUCTURAL FILL SUITABILITY

Samples of materials proposed for use as imported structural fill should be submitted to the geotechnical consultant for testing and evaluation prior to being transported to the project area. Imported materials and onsite materials that have been excavated, stockpiled, and processed for use as structural fill should be in accordance with the following recommendations:

- Materials used as retaining wall backfill should have 10 percent, or less, of material passing the No. 200 sieve and 100 percent passing the 3-inch sieve.
- Imported fill materials and excavated onsite material should be free of debris, organic materials, and other deleterious materials.
- Imported fill materials and excavated onsite material should meet the gradation and plasticity specifications for “Selected Backfill” described in the USS.
- Imported fill materials and excavated onsite material should have a remolded swell potential of less than 8 percent as evaluated by the procedure outlined in Section 1803.5.3.2 of the SNA to the 2012 IBC (SNBO, 2013).
- Imported fill materials and excavated onsite material should contain less than 1.00 percent by dry weight soluble solids as determined by American Water Works Association (AWWA) standard test method 2540 C.
- Imported fill materials and excavated onsite material should contain less than 1.0 percent by dry weight soluble sulfate as determined by AWWA standard test method 4500 E.
- Imported fill materials and excavated onsite material should have soluble soil chloride content less than 500 ppm as determined by AWWA Standard Test Method SM4500-CI D unless appropriate corrosion mitigation and/or protection is utilized in the design of proposed structures.

Soils used as structural fill should be moisture-conditioned to approximately optimum moisture content and placed and compacted in uniform horizontal lifts to a relative compaction of 90 percent, as evaluated by ASTM D1557 (AASHTO T180 within roadway ROW). Fill placed deeper than 5 feet below finished grade outside of trench backfill areas should be compacted to 95 percent relative compaction. The optimal lift thickness of fill will depend on the type of soil and compaction equipment used, but should generally not exceed approximately 8 inches in loose thickness. Placement and compaction of structural fill should be performed in accordance with the referenced USS (RTCSS, 2003).

Earthwork operations should be observed and compaction of structural fill materials should be tested by the project’s geotechnical consultant. Typically, one field test should be performed per lift for each 200 linear feet in trench backfill and/or for each approximately 500 cubic yards of fill

placement in structural areas. Additional field tests may also be performed in structural and non-structural areas at the discretion of the geotechnical consultant.

4.2. MICRO-TUNNELING CONSIDERATIONS

We understand that micro-tunneling techniques may be planned for construction near the southern portion of the alignment, to cross beneath the existing trapezoidal channel in the area. The tunnel is planned to extend less than approximately 100 feet and will include the excavation of tunneling pits near the beginning and end of the tunneling segment. The pipeline in the area of the proposed micro-tunneling located near boring B-6 and B-7 will have an invert depth of approximately 20 feet below existing grade. The tunnel may be lined with steel casing, approximately 18 inches in diameter.

We do not anticipate that soils in the micro-tunneling zones will include layers of hard, strongly cemented caliche; however, some cemented soils may be encountered during tunneling. Some cobbles and small boulders may also be encountered. The presence of cemented soil layers and oversize materials, such as cobbles and small boulders, will impede excavation/micro-tunneling operations and may cause some difficulty in maintaining the desired alignment of tunneling equipment. Rock-tunneling techniques may be needed if strongly cemented soils are encountered. In tunneling/receiving pit excavations, use of heavy-duty ripping/excavation equipment, may also need to be considered. Additional description of typical properties of caliche is provided in Section 2.6.2.

4.3. OBSERVATION AND TESTING

A qualified geotechnical consultant should perform appropriate observation and testing services during grading and construction operations. These services should include observation of removal of soft, loose, or otherwise unsuitable soils, evaluation of subgrade conditions where soil removals are performed, and performance of observation and testing services during placement and compaction of structural fill and backfill soils. In-place density and moisture tests should be performed in accordance with ASTM D6938 or, alternatively, in accordance with ASTM D1556. The test frequency should be as indicated in the project specifications, or if no indication is provided, at least one test per 200 cubic yards of fill material placed or at least 2 tests per lift of fill material placed, whichever is more. Additional field tests may also be performed in structural and non-structural areas at the discretion of the geotechnical consultant.

4.4. PIPELINE DESIGN

External loads that will be imposed on the buried pipe are dependent on subsurface conditions, type of pipe used, height of soil above pipe, method of pipe placement, backfill conditions, and other factors. The effect of traffic loads on the pipeline should be considered for portions of the alignment that extend, or will extend in the future, beneath roadways. Additional traffic loads should be added to the soil loads in these areas. Additional recommendations for pipeline design are provided in the following subsections.

4.4.1. MODULUS OF SOIL REACTION (E')

The modulus of soil reaction (E') is used to characterize the soil-pipe relationship for the purpose of evaluating deflection caused by external loads on the pipe. E' is dependent upon a variety of factors including trench width, pipe diameter, springline depth, backfill material, backfill compaction, and relative compaction density of the trench wall soils. The pipeline designer should have a sound understanding of how these, and other, factors influence the parameters used in the design equations utilized during the design and consider the effects of the actual pipeline construction methods on those factors.

It is our understanding that the depth to the top of the pipe (or cover) will range in depth up to 5 feet in cut-and-cover areas. To provide estimates of E', which may be used in the pipeline design in cut-and-cover areas along the alignment, we have prepared the following table based on methods described in the referenced article, Modulus of Soil Reaction (E') Values for Pipeline Design, (Jeyapalan, 2004) along with the following assumptions:

- Springline depth of approximately 5 feet.
- Trench width of approximately 3 feet.
- E' value of 2,500 psi for Type II Aggregate Base trench backfill.
- E' value of 15,000 psi for CLSM trench backfill.
- Native soil standard proctor relative compaction density of 85 to 90 percent.

If these assumptions are not considered appropriate, this office should be notified.

Table 4.5.1. Estimates of Subgrade Modulus, E'

Boring	Backfill	E' Value* (psi/inch)
B-1 to B-7	Type II Aggregate Base	800
	CLSM	2,300

4.4.2. VERTICAL LOADS AND FOUNDATIONS

For calculation of overburden loads, Type II Aggregate Base pipe zone and trench final zone backfill soils, when placed and compacted as specified, may be assumed to have a unit weight of approximately 135 pounds per cubic foot (pcf). Native soils used as trench backfill may have a unit weight of approximately 120 pcf. This value is based on soils being compacted to a relative compaction of 90 percent of the maximum dry density (AASHTO T180). CLSM used as pipe zone and trench backfill material is anticipated to have a unit weight of approximately 120 pcf.

The base of vaults should be founded on 4 inches of Type II Aggregate Base overlying medium dense to very dense granular soils, firm to very stiff fine-grained soils, caliche, or structural fill (recompacted native soils). Exposed loose or disturbed surficial soil at the base of vault excavations should be moisture-conditioned to approximately optimum moisture content and compacted to 90 percent relative compaction (AASHTO T180) or more. The Type II Aggregate Base should be in accordance with USS Subsection 704.03.04 and be similarly moisture-conditioned and compacted. An allowable bearing value of 1,000 psf may be used in design of vaults with a base 1 foot wide and embedded 1 foot or more below the lowest adjacent finished grade. This allowable value may be increased by 200 psf for each additional 1 foot of width and 700 psf for each additional 1 foot of embedment up to a value of 3,000 psf. Lateral resistance for footings and the frictional resistance to lateral loads are presented in Section 4.4.4. Seismic parameters for design of structures for the preojct are provided in the following section.

We recommend that conventional footings be reinforced with two No. 4 or larger steel reinforcing bars, one placed near the top and one near the bottom of the footing, and in accordance with a qualified structural engineer's recommendations. Increased reinforcement may be recommended by the structural engineer.

4.4.3. SEISMIC DESIGN PARAMETERS

Based on review of the Clark County Seismic Shear Wave Velocity Map, the project alignment is located in an area previously mapped by Clark County as having an average soil shear wave velocity associated with a Seismic Site Class D (GISMO, 2008). Confirmation testing of Seismic Site Class by GES via an independent geophysical study or subsurface exploration was not included in the scope of the geotechnical evaluation presented in this report. In accordance with Section 1613 of the 2012 IBC (ICC, 2012), a Seismic Site Class D may be assumed for this

project and the following seismic design parameters, which were developed using the recommended Site Class and representative coordinates of 36.2190 degrees latitude and -115.0519 degrees longitude for the project alignment.

Table 4.5.3 Spectral Response Accelerations and Site Coefficients – Site Class D

Description	Value
Spectral Response Acceleration at Short Periods, Ss	0.513g
Spectral Response Acceleration at 1-Second Period, S1	0.168g
Spectral Response Coefficient at Short Periods, SDs	0.475
Spectral Response Coefficient at 1-Second Period, SD1	0.238
Peak Ground Acceleration	0.206g

4.4.4. LATERAL EARTH PRESSURES

Retaining elements, if needed for the project, should be designed according to the recommendations in this report. Lateral active earth pressures induced by adjacent uniform surface surcharge loads should be estimated as a uniformly distributed lateral load with a magnitude equal to the magnitude of the surface surcharge load multiplied by an appropriate earth pressure coefficient. GES is presenting earth pressure coefficients for “active” and “at-rest” wall conditions. In the “active” condition the wall is able to deflect such that stresses from the retained soils are lessened. The “at rest” condition considers the walls to be rigid, or restrained, such that the walls do not deflect to lessen stresses from retained soils. Retaining walls with level backfill should be designed to resist the lateral earth pressures for the appropriate conditions presented on Figure C-1, located in Appendix C of this report.

The values presented in Figure C-1 assume that the build-up of hydrostatic pressure against subsurface walls will be possible. In order to reduce the build-up of hydrostatic pressure from nuisance water, a footing drainage system could be installed; however, subsurface walls below groundwater should be designed to accommodate anticipated hydrostatic pressures. Consideration should also be given to waterproofing subsurface walls that extend near or below anticipated high groundwater elevation.

Resistance to lateral loads may be estimated using both passive lateral earth support and friction developing between the wall footing and underlying soil. Passive resistance may be used if foundation backfill soils in front of the wall are compacted to 90 percent, or more, of the maximum laboratory dry density (ASTM D1557). The upper 12 inches below the ground surface should be neglected if passive resistance is used. The passive lateral earth support for

subsurface walls may be estimated based on an equivalent fluid density of 300 pcf up to a maximum passive lateral pressure of 2,000 psf. A coefficient of friction of 0.34 may be used for the interface between the wall footing and underlying properly compacted structural fill. The values for the equivalent fluid density and coefficient of friction presented above do not include a specific factor of safety; the project engineer should use appropriate factors of safety for design.

Backfill placed behind retaining walls or subsurface walls should consist of structural fill meeting the criteria presented in this report. Backfill placed behind retaining walls should be placed in 8-inch maximum vertical lifts and should be compacted to between 90 and 95 percent of the maximum laboratory dry density as evaluated by ASTM D1557. Overcompaction adjacent to retaining walls or subsurface walls should be avoided. The lateral earth pressures shown on Figure C-1 assume that compaction behind retaining walls or subsurface walls will be accomplished with relatively light compaction equipment.

4.5. PAVEMENT REPLACEMENT

Pavement patching in pipeline trench areas for this project should be performed in accordance with the USS (RTCSS, 2003), which provides specifications for thickness of pavement and underlying aggregate base/CLSM depending on the width of the roadway ROW.

In areas of pavement removal and patching, pavement saw-cuts should be linear and vertical. The pavement should be saw-cut a few inches beyond the soil excavation as shown on Drawing No. 503AF of the referenced Uniform Standard Drawings for Public Works Construction (Clark County, 2001). Saw-cuts should be adequately cleaned and then coated with an appropriate tack-coat prior to placement of new pavement.

4.6. CONCRETE AND CORROSION CONSIDERATIONS

Based on the results of chemical testing, the tested onsite soils have negligible sulfate exposure as described in Section 1904.2 of the 2012 IBC (ICC, 2012). However, based on our experience and the types of soils in the project area, sulfate concentrations are anticipated to be encountered that should be considered severely deleterious to normal strength concrete. Accordingly, we recommend that concrete in contact with onsite soils, along with subsurface walls up to 12 inches above finished grade, contain Type V cement and have a design compressive strength of 4,500 pounds per square inch (psi). In addition, it is recommended that reinforcing bars in cast-against-grade concrete, with the exception of slab-on-grade floors and

exterior concrete flatwork, be covered by approximately 3 inches or more of concrete. Concrete should be placed with an approximate 4-inch slump, or as specified by the structural engineer of record, and good densification procedures should be used during placement to reduce the potential for honeycombing. Concrete samples should be obtained, as indicated by ACI manual Section 318 (ACI, 2011), and tested by the project's geotechnical consultant. Structural concrete should be placed in accordance with American Concrete Institute and project specifications.

Based on the results of chemical testing, some of the tested soils contain chloride concentrations that should be considered corrosive to reinforcing steel and tendons. In accordance with Section 6.2.2 of the 2008 Standard Requirements for Design of Shallow Post-Tensioned Concrete Foundations on Expansive Soils (PTI, 2008), the project structural engineer and/or corrosion engineer should implement appropriate corrosion protection methods as outlined in in Section 6.2.2 of the 2008 Standard Requirements. Corrosion mitigation includes minimum concrete cover, encapsulation of tendons, anchors, and wedges, use of epoxy coated reinforcement, and blending onsite soils with imported soil having relatively low chloride content so that the resulting blended materials have a chloride concentration of less than 500 ppm.

4.7. PLAN REVIEW

The recommendations presented in this report are based on preliminary design information for the proposed project, as provided by Greeley and Hansen personnel, and on the findings of our geotechnical evaluation. When finished, project improvement plans should be reviewed in accordance with Section 1803.6, Item 28 of the SNA to the 2012 IBC (SNBO, 2013) by the geotechnical engineer to evaluate whether the project improvement plans are consistent with the geotechnical design criteria presented in this report.

4.8. PRE-CONSTRUCTION MEETING

We recommend that a pre-construction meeting be held. The owner or the owner's representative, the civil engineer, the contractor, and the geotechnical consultant should be in attendance to discuss the plans and the project.

5. LIMITATIONS

The recommendations contained in this report are based on field exploration, laboratory testing, research of referenced maps and literature, and our understanding of the proposed construction. The soil data used in the preparation of this report were obtained from 25 borings. It is possible that variation in the soil conditions will exist between the locations explored. Therefore, if any soil conditions are encountered along the alignment that are different from those outlined in this report, Geotechnical & Environmental Services, Inc. should be immediately notified so that we may review the situation that exists and make supplementary recommendations as needed. In addition, if the scope of the proposed construction, including the types of structures, anticipated loads and maximum cut and fill depths, changes from what is described in this report, our firm should be notified. A detailed excavatability or rippability evaluation is beyond the scope of this study.

The recommendations presented in this report are based on the assumption that an adequate number of tests and observations will be made during construction to evaluate compliance with the recommendations. These tests and observations should be provided under the direction of a qualified geotechnical consultant. Such testing and observations should include but not be limited to the following:

- Review of construction plans for conformance with the soils investigation.
- Observation and testing during preparation, grading, footing and other excavations, and placement of fill, aggregate base, concrete, mortar, grout, asphalt concrete, and steel reinforcement.
- Consultation as may be required during construction.

Our services were performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable engineering firms in this or similar localities. No other warranties, either express or implied, are included or intended in this report.

6. REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), 2007, Standard Specifications for Transportation Materials and Methods of Sampling and Testing, Part 2A: Tests, 27th Edition.

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APPENDIX A
SUBSURFACE STUDY

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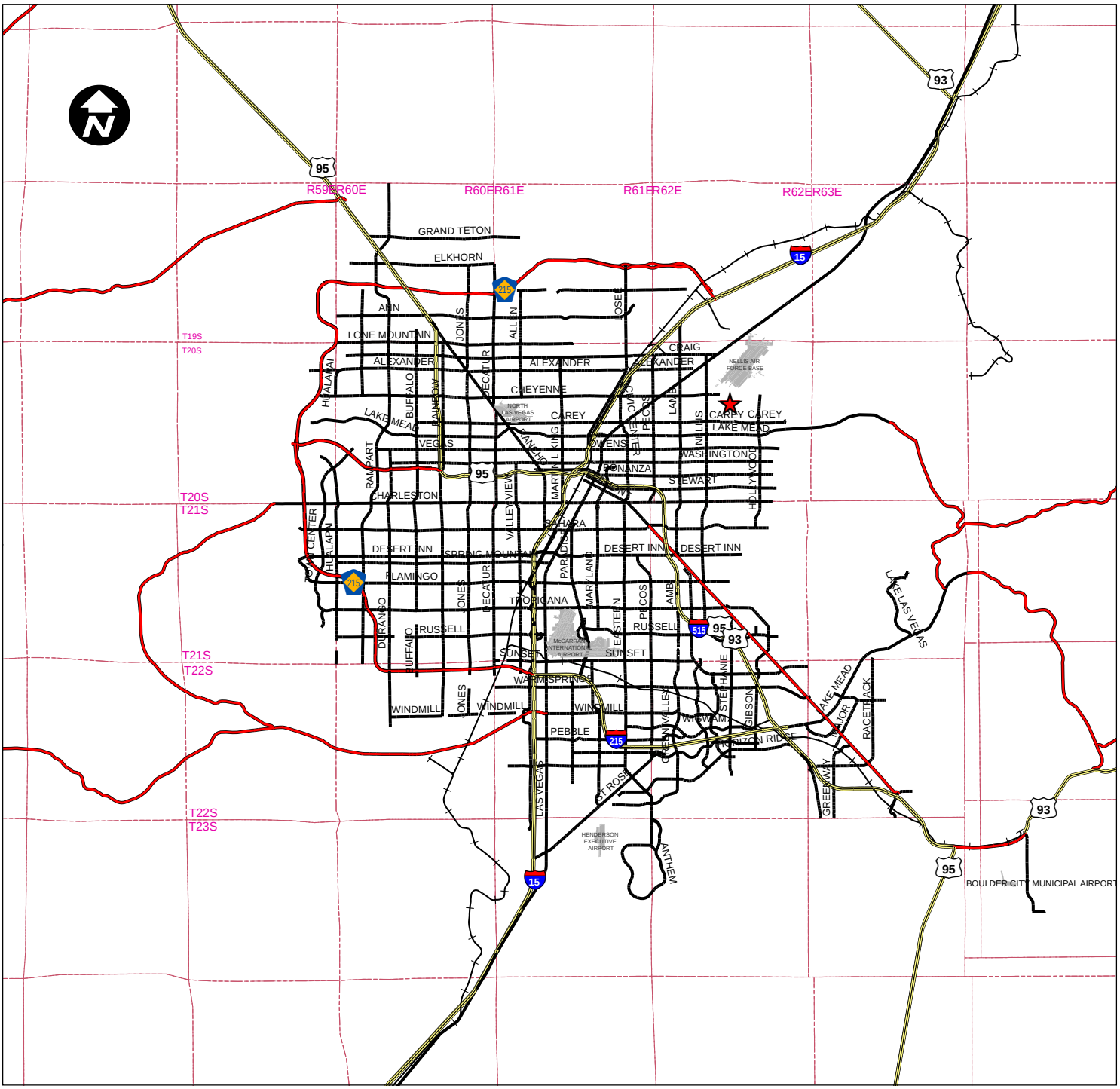

Legend

- Approximate Project Location
- Airports
- Township & Range
- Interstate
- Major Streets
- Railroad
- State Highway

Linear Faults (USGS, 2010)

- Class B
- Less than 1,600,000 years
- Less than 750,000 years
- Less than 130,000 years
- Less than 15,000 years
- Less than 150 years
- Unknown

NOTE: Data presented on this map is a compilation of GIS Metadata extracted from a variety of sources. Major Streets, Airports, and Railroads is data obtained from the Southern Nevada GIS Management Office. This data is downloaded by GES for incorporation into drawings generated by GES. Data contained within this page is to be used for informational purposes only. GES has not modified the data contained herein and uses it as it is acquired from the respective agency.

GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.
7150 Placid St.
Las Vegas, NV 89119
702-365-1001
www.gesnevada.com

VICINITY MAP
NELLIS RECLAIMED WATERLINE
NORTH LAS VEGAS, NEVADA

Drawn By:	Date Drawn:
MIJ	6/8/2016
Project No.	Figure No.
20153828E1	A-1

J:\Jobs\2015_Jobs\20153828\E1\Figures\Maps\Figure A-1.mxd

Legend

B-7
TD=26.5ft Approximate Boring Locations

0 250 500 1,000 1,500 2,000
Feet

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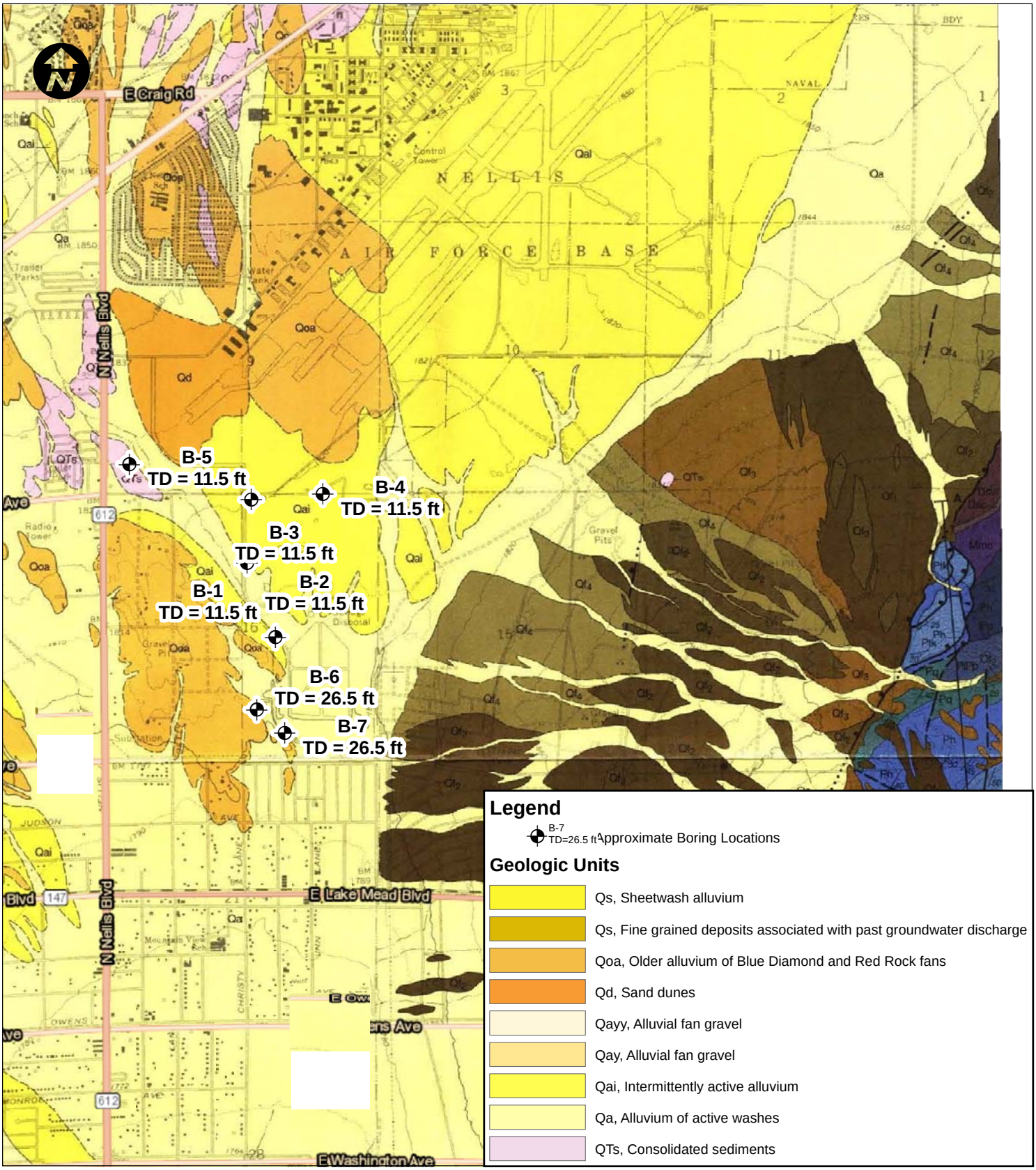
NOTE: All locations are approximate. TD denotes total depth of exploration in feet. Data presented on this map is a compilation of GIS Metadata extracted from a variety of sources. Major Streets, Airports, and Railroads is data obtained from the Southern Nevada GIS Management Office. This data is downloaded by GES for incorporation into drawings generated by GES. Data contained within this page is to be used for informational purposes only. GES has not modified the data contained herein and uses it as it is acquired from the respective agency.

BORING LOCATION MAP
NELLIS RECLAIMED WATERLINE
NORTH LAS VEGAS, NEVADA

Drawn By:	Date Drawn:
MIJ	6/8/2016
Project No.	Figure No.
20153828E1	A-2

J:\Jobs\2015_Jobs\20153828\E1\Figures\MapsFigure A-2.mxd



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NOTE: All locations are approximate. TD denotes total depth of exploration in feet. Data presented on this map is a compilation of GIS Metadata extracted from a variety of sources. Major Streets, Airports, and Railroads is data obtained from the Southern Nevada GIS Management Office. This data is downloaded by GES for incorporation into drawings generated by GES. Data contained within this page is to be used for informational purposes only. GES has not modified the data contained herein and uses it as it is acquired from the respective agency.

MAPPED GEOLOGIC UNITS
NELLIS RECLAIMED WATERLINE
NORTH LAS VEGAS, NEVADA

Drawn By:	Date Drawn:
PES	6/21/2016
Project No.	Figure No.
20153828E1	A-2a

J:\Jobs\2015_Jobs\20153712\E1\Figures and Maps\GIS\Figure A-2.mxd

KEY TO SYMBOLS AND TERMS

Terms used according to the Unified Soil Classification System

Consistency or Condition of Soils

Fine-Grained Soils (Silt and Clay): Major portion passing #200 sieve

California Sampler* (blows/foot)	SPT** (blows/foot)	Estimated Consistency	Unconfined Compressive Strength (tsf)	Manual Manipulation
< 2	< 2	Very Soft	< 0.25	Thumb will penetrate soil more than 1 in.
2-5	2-4	Soft	0.25-0.50	Thumb will penetrate soil about 1 in.
5-10	4-8	Firm	0.50-1.00	Thumb will penetrate soil about $\frac{1}{4}$ in.
10-20	8-15	Stiff	1.00-2.00	Thumb will not indent soil but readily indented with thumbnail.
>20	>15	Very Stiff	>2.00	Thumbnail will not indent soil.

*ASTM D 3550 using a 140-pound hammer falling 30 inches.
**ASTM D 1586

Coarse-Grained Soils (Sand and Gravel): Major portion retained on #200 sieve

California Sampler* (blows/foot)	SPT** (blows/foot)	Estimated Consistency	Behavior of $\frac{1}{2}$-inch Diameter Probe Rod
0-7	0-4	Very Loose	Easily penetrated when pushed by hand.
7-18	4-10	Loose	Firmly penetrated when pushed by hand.
18-50	10-30	Medium Dense	Easily penetrated when driven by 1 lb. hammer.
50-90	30-50	Dense	Penetrated less than 1 inch when driven with a 1 lb. hammer.
>90	>50	Very Dense	Penetrated less than $\frac{1}{4}$ inch when driven with a 1 lb. hammer.

*ASTM D 3550 using a 140-pound hammer falling 30 inches.
**ASTM D 1586

Cementation	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Caliche and Cemented Sand and Gravel: Materials classified as medium hard, hard, or very hard caliche or cemented sand and gravel should be treated as rock per Appendix K of the Southern Nevada Amendments to the 2000 International Building Code, published February 11, 2003.

Misc. Symbols

- Exploration continues
- Initial groundwater depth
- Final groundwater depth

Constituent Percentages

Trace - < 5%

Few - 5 to 10%

Little - 15-25%

Some - 30-45%

Mostly - 50-100%

Moisture Condition

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp but no visible water

Wet - Visible free water, usually soil is below water table

Notes

1. Subsurface explorations were performed using the equipment listed on the exploration logs.
2. Subsurface explorations were performed on the date(s) shown on the exploration logs.
3. Soil sampler(s) were driven with a 140 pound hammer falling 30 inches (unless otherwise noted in the text of this report).
4. The transitions between soil types shown on the exploration logs as occuring abruptly at particular depths may in actuality be a gradual progression from one soil type to the next.
5. Exploration logs are subject to the limitations, conclusions, and recomendations presented in this report.

Strata Group Symbols

- Fill
- CL- Low plasticity clay
- CH - High plasticity clay
- ML - Silt
- MH - Elastic Silt
- SP - Poorly graded sand
- SW - Well - graded sand
- GP - Poorly graded gravel
- GW - Well - graded gravel
- Cemented sand and gravel
- Caliche

Soil Sampler Symbols

- Bulk Sample
- Sample from auger cutting
- California Sampler
- Standard Penetration test
- Shelby tube

GES

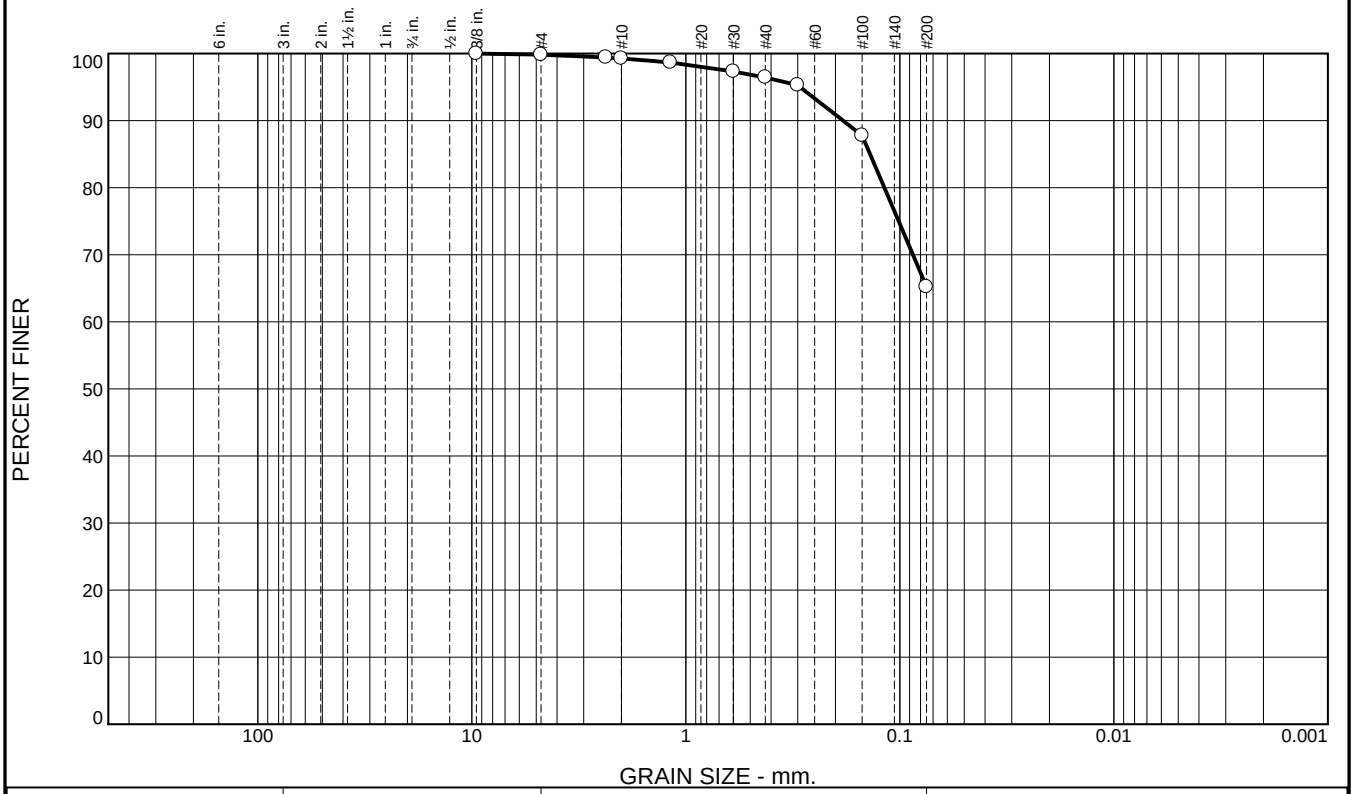
Disclaimer

This Key to Symbols is part of a report prepared by Geotechnical & Environmental Services, Inc. and should be used with the report. The descriptions on the exploration logs apply only at the specific exploration locations and at the time the explorations were made. They are not warranted to be representative of subsurface conditions at other locations or times.

Figure No. A-3

APPENDIX B
LABORATORY TEST RESULTS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	3	31	65	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100		
#4	100		
#8	99		
#10	99		
#16	99		
#30	97		
#40	96		
#50	95		
#100	88		
#200	65		

* (no specification provided)

Material Description

Sandy lean clay

Atterberg Limits

PL= 16 LL= 35 PI= 19

Classification

USCS= CL AASHTO= A-6(10)

Remarks

SAMPLED BY:M. JAVIER
ASTM D6913

Location: BORING B-1 @ 10.0'-11.5'
Sample Number: B-1 **Depth:** 10.0'-11.5' **Date:** 06/13/16

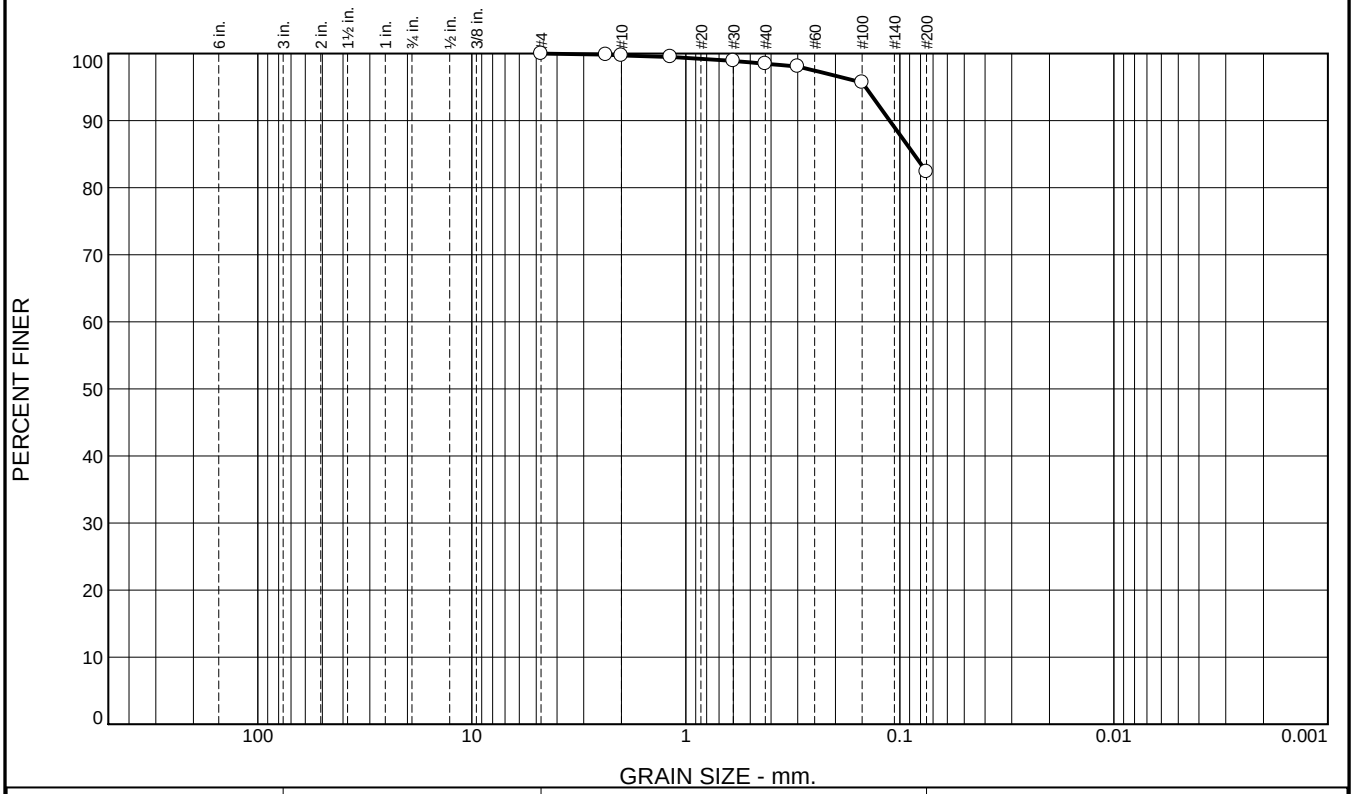
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-1

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	2	16	82	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#10	100		
#16	99		
#30	99		
#40	98		
#50	98		
#100	96		
#200	82		

* (no specification provided)

Material Description

Lean clay with sand

Atterberg Limits

PL= 17 LL= 34 PI= 17

Classification

USCS= CL AASHTO= A-6(13)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-2 @ 2.0'-5.0'
Sample Number: B-2 **Depth:** 2.0'-5.0' **Date:** 06/13/16

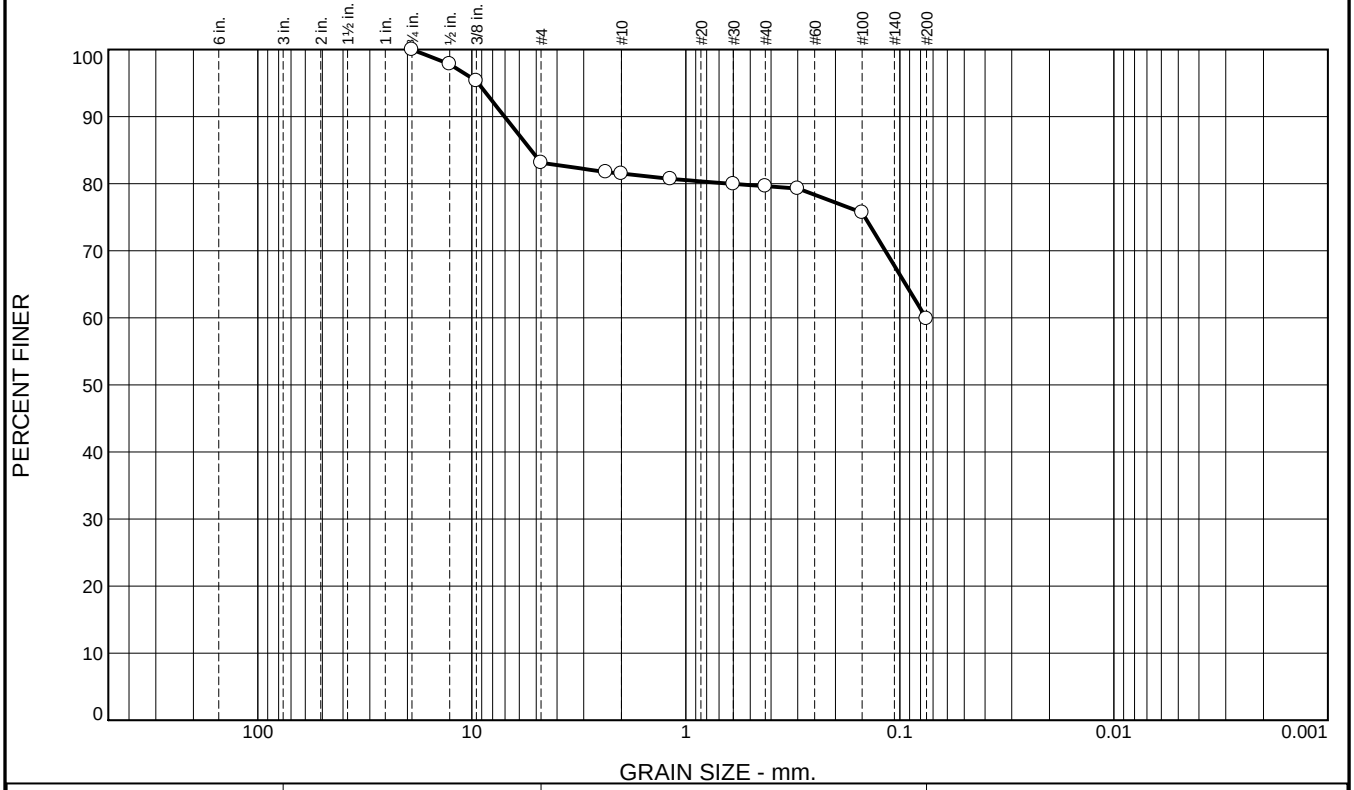
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-2

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	17	1	2	20	60	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100		
.5	98		
.375	95		
#4	83		
#8	82		
#10	82		
#16	81		
#30	80		
#40	80		
#50	79		
#100	76		
#200	60		

* (no specification provided)

Material Description

Sandy lean clay with gravel

Atterberg Limits

PL= 14 LL= 34 PI= 20

Classification

USCS= CL AASHTO= A-6(9)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-3 @ 2.0'-5.0'
Sample Number: B-3 **Depth:** 2.0'-5.0' **Date:** 06/13/16

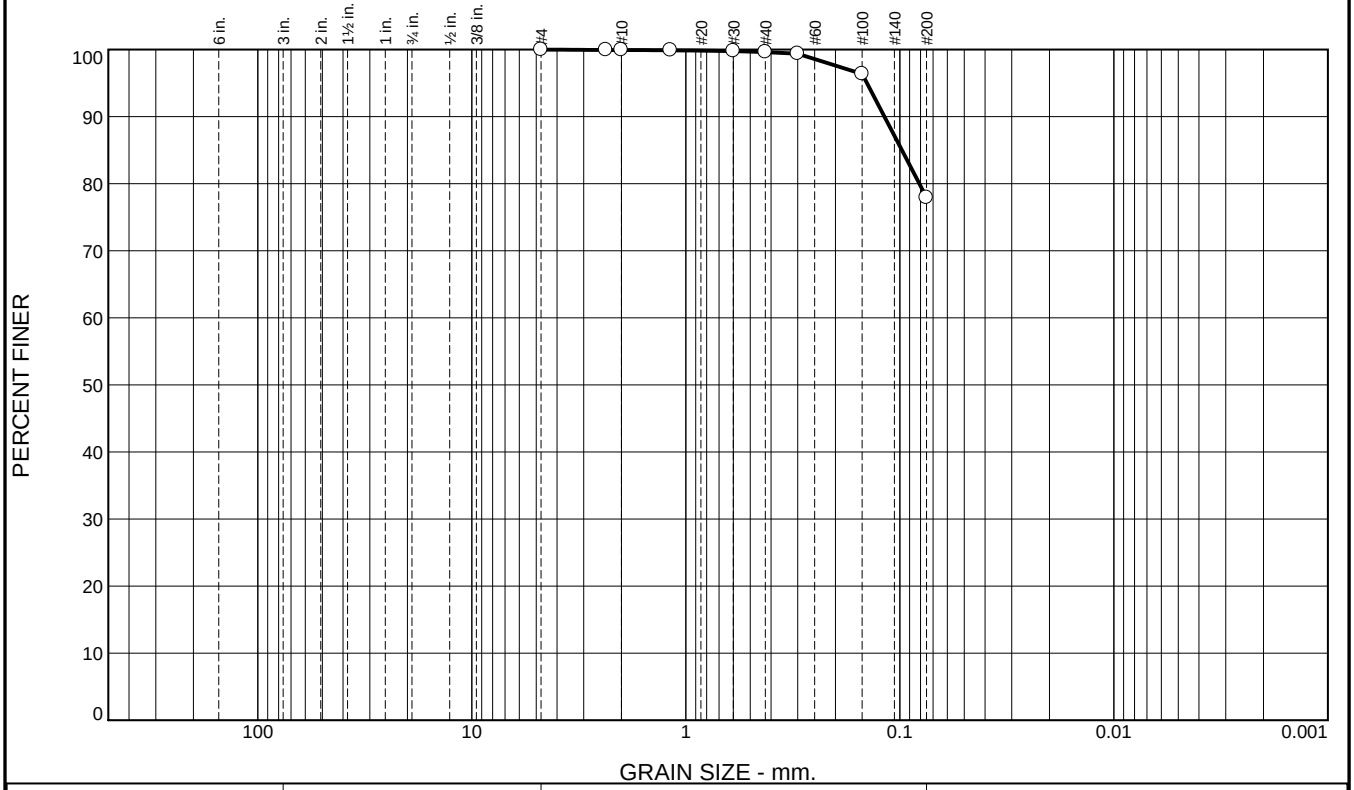
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-3

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	0	22	78	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#8	100		
#10	100		
#16	100		
#30	100		
#40	100		
#50	99		
#100	96		
#200	78		

* (no specification provided)

Material Description

Lean clay with sand

Atterberg Limits

PL= 18 LL= 26 PI= 8

Classification

USCS= CL AASHTO= A-4(4)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-4 @ 2.0'-5.0'
Sample Number: B-4 **Depth:** 2.0'-5.0' **Date:** 06/13/16

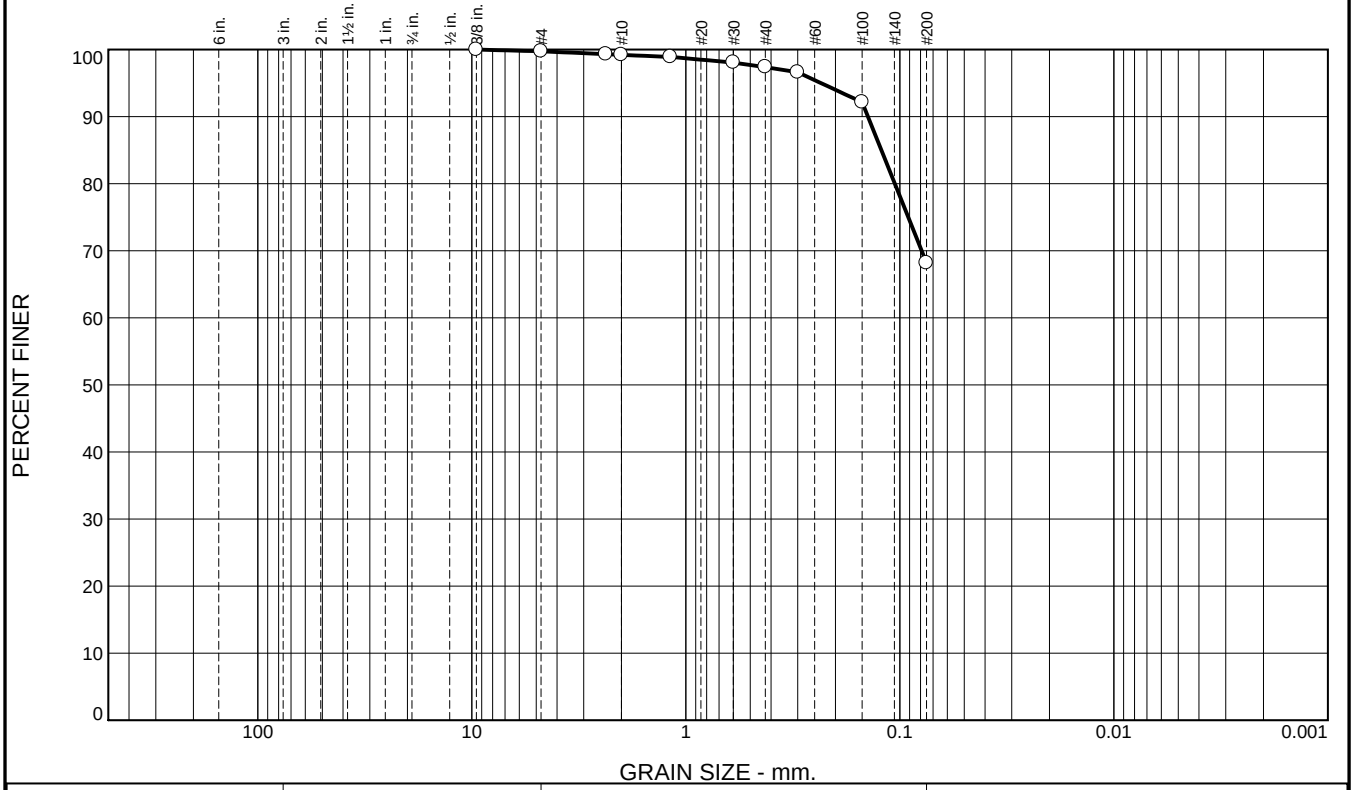
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-4

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	2	29	68	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100		
#4	100		
#8	99		
#10	99		
#16	99		
#30	98		
#40	97		
#50	97		
#100	92		
#200	68		

* (no specification provided)

Material Description

Sandy lean clay

Atterberg Limits

PL= 16 LL= 30 PI= 14

Classification

USCS= CL AASHTO= A-6(7)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-5 @ 2.0'-5.0'
Sample Number: B-5 **Depth:** 2.0'-5.0' **Date:** 06/13/16

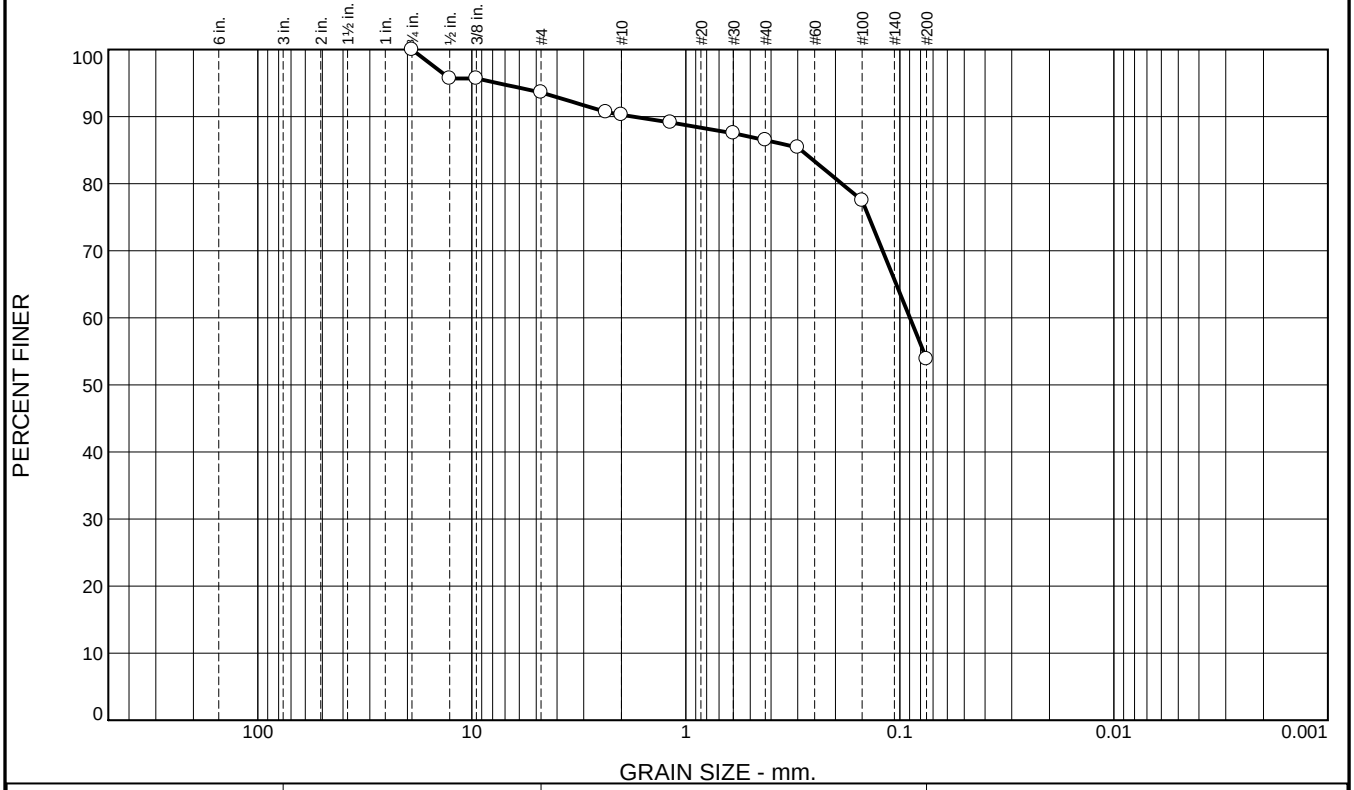
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-5

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	6	4	4	32	54	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100		
.5	96		
.375	96		
#4	94		
#8	91		
#10	90		
#16	89		
#30	88		
#40	86		
#50	85		
#100	78		
#200	54		

* (no specification provided)

Material Description

Sandy lean clay

Atterberg Limits

PL= 16 LL= 30 PI= 14

Classification

USCS= CL AASHTO= A-6(4)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-7 @ 2.0'-5.0'
Sample Number: B-7 **Depth:** 2.0'-5.0' **Date:** 06/13/16

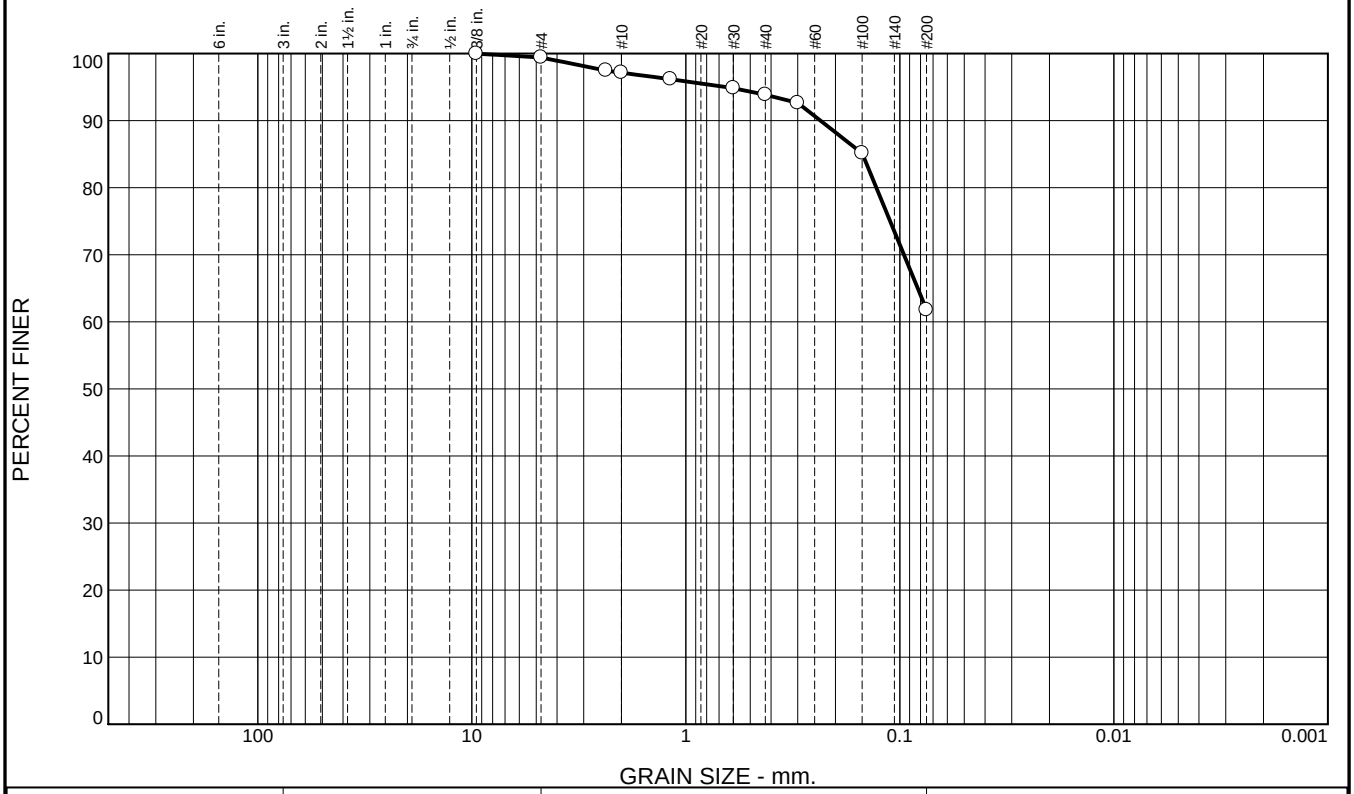
GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-6

Tested By: A. SANDERS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	1	2	3	32	62	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100		
#4	99		
#8	97		
#10	97		
#16	96		
#30	95		
#40	94		
#50	93		
#100	85		
#200	62		

* (no specification provided)

Material Description

Sandy lean clay

Atterberg Limits

PL= 16 LL= 34 PI= 18

Classification

USCS= CL AASHTO= A-6(8)

Remarks

SAMPLED BY: M. JAVIER
ASTM D6913

Location: BORING B-7 @ 15.0'-20.0'
Sample Number: B-7 **Depth:** 15.0'-20.0' **Date:** 03/13/16

GES **GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.**

Client: GREELEY AND HANSEN
Project: NELLIS RECLAIMED WATERLINE PROJECT

Project No: 20153828E1 **Figure** B-7

Tested By: A. SANDERS

PROCTOR TEST REPORT

Project No.: 20153828E1 **Date:** 06/09/16
Project: NELLIS RECLAIMED WATERLINE PROJECT
Client: GREELEY AND HANSEN
Location: BORING B-6 @ 15.0'-20.0'
Sample Number: B-6 **Depth:** 15.0'-20.0'
Remarks:

MATERIAL DESCRIPTION

Description:

Classifications - **USCS:** **AASHTO:**
Nat. Moist. = **Sp.G. =** 2.65
Liquid Limit = **Plasticity Index =**
% < No.200 =

TEST RESULTS
Maximum dry density = 95.5 pcf
Optimum moisture = 18 %

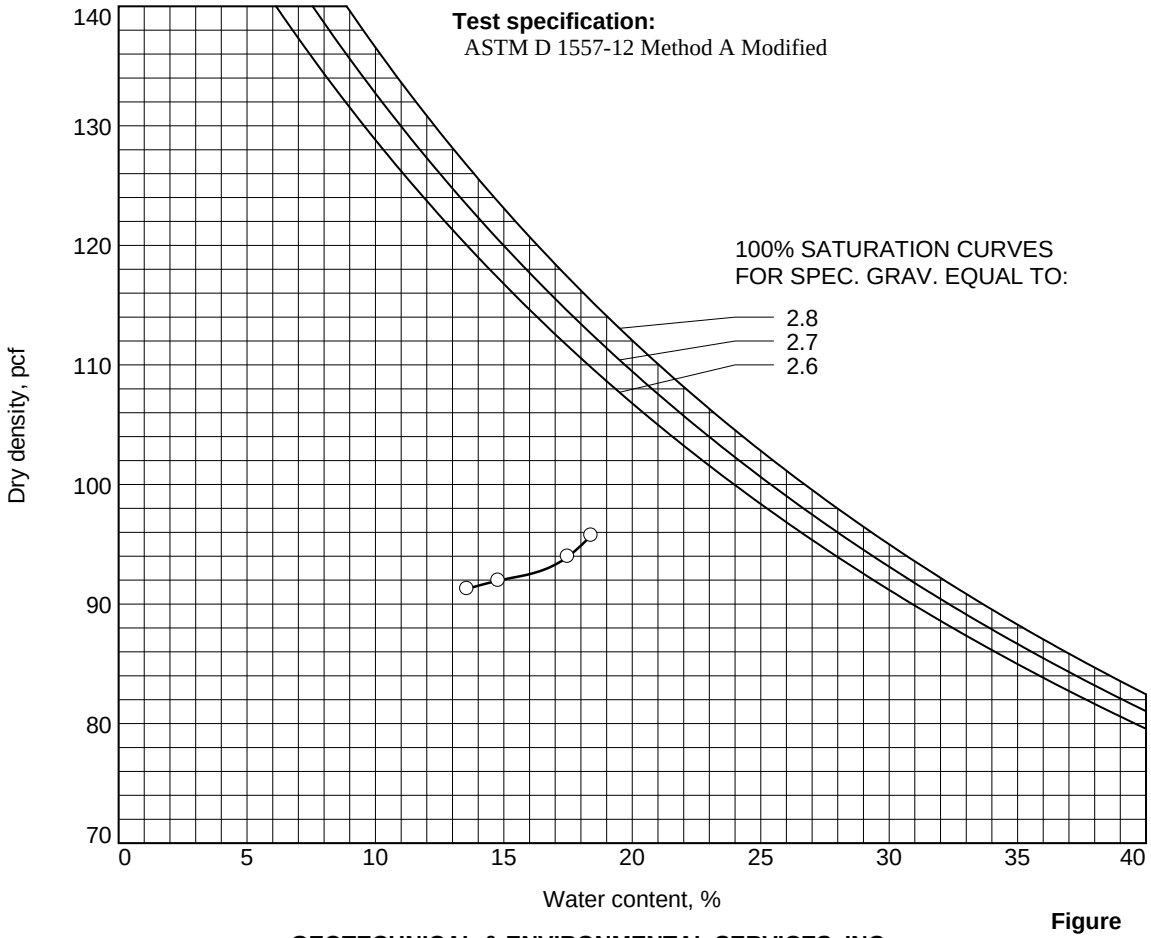


Figure B-8

GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.

Tested By: S. COX

PROCTOR TEST REPORT

Project No.: 20153828E1 **Date:** 06/09/16
Project: NELLIS RECLAIMED WATERLINE PROJECT
Client: GREELEY AND HANSEN
Location: BORING B-7 @ 2.0'-5.0'
Sample Number: B-7 **Depth:** 2.0'-5.0'
Remarks:

MATERIAL DESCRIPTION

Description: Sandy lean clay

Classifications - **USCS:** CL **AASHTO:** A-6(4)
Nat. Moist. =
Liquid Limit = 30
Sp.G. = 2.65
Plasticity Index = 14
% < No.200 = 54 %

ROCK CORRECTED TEST RESULTS
Maximum dry density = 115 pcf
Optimum moisture = 14 %

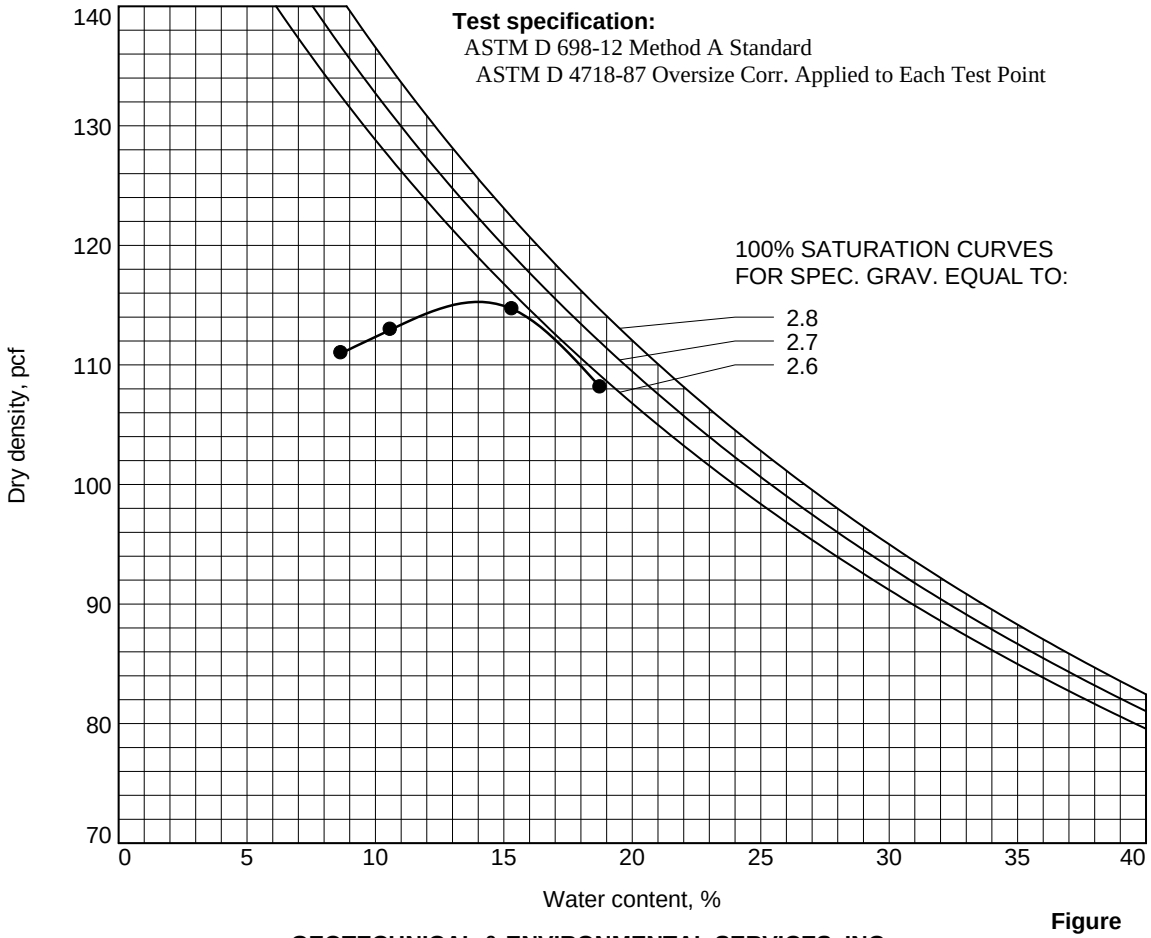


Figure B-9

GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.

Tested By: S. COX

GEOTECHNICAL &
ENVIRONMENTAL
SERVICES, INC.

7150 PLACID STREET
LAS VEGAS NV, 89119
1-702-365-1001

SWELL TEST SUMMARY

Project Name: Nellis AFB Reclaimed Waterline
Project No.: 20153828E1
Sample Dates: 6/3/2016
Client: Greeley and Hansen
Test Method: SNBC 1803.5.3.2
Report Date: 6/9/2016

LAB NUMBER	SAMPLE LOCATION	SAMPLE DEPTH (feet)	SOIL TYPE (USCS)	TEST CONDITION	SURCHARGE LOAD (psf)	INITIAL DRY DENSITY[1] (pcf)	INITIAL MOISTURE CONTENT[2] (%)	FINAL MOISTURE CONTENT (%)	EXPANSION[3] (%)
16-233	B-1	5.0-6.4	CL	Insitu	60	117.8	4.6	21.6	0
16-233	B-2	5.0-6.5	CL	Insitu	60	116.0	8.1	22.1	-1
16-233	B-3	5.0-6.0	CL	Insitu	60	119.2	11.1	20.9	2
16-233	B-4	5.0-6.5	CL	Insitu	60	115.9	5.2	21.2	-2
16-233	B-6	5.0-6.5	CL	Insitu	60	119.9	3.8	18.6	-3
16-233	B-7	5.0-6.5	CL	Insitu	60	121.7	6.3	20.5	1

1 Remolded samples were remolded to approximately 90% of the estimated soil maximum dry density (ASTM D 1557).
2 Moisture content prior to oven drying.
3 Positive values refer to swell. Negative values refer to collapse.

SilverState Analytical Laboratories

LABORATORY REPORT

DATE: June 13, 2016

LABORATORY NO: 16-4178

CLIENT: GES
7150 Placid St
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 20153828E1

CLIENT PO #:

ANALYST: ET/CR

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 06/09/16
Time Received: 0935

Sample ID: 16-233, B-2 @ 2.0'-5.0'

Analysis	Result	Unit	Method
Sodium (Na)	0.07	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.01	%	AASHTO T290
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.01	%	Calculation
Total Salts (Solubility)	0.14	%	SM2540C
Sulfide	<1.0	mg/kg	SM4500S2F
pH	8.98	S.U.	AASHTO T289
Redox	346	mV	SM2580B
Soluble Soil Chlorides	34.3	mg/kg	AASHTO T291
Resistivity	617	Ω-cm	AASHTO T288

Note: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3626 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

Figure B-11

SilverState Analytical Laboratories

LABORATORY REPORT

DATE: June 13, 2016

LABORATORY NO: 16-4129-1

CLIENT: GES
7150 Placid St
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 20153828E1

CLIENT PO #:

ANALYST: ET/CR

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 06/08/16
Time Received: 1327

Sample ID: 16-233, B-3 @ 10'-11.5'

Analysis	Result	Unit	Method
Sodium (Na)	0.12	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	AASHTO T290
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.03	%	Calculation
Total Salts (Solubility)	0.31	%	SM2540C
Sulfide	<1.0	mg/kg	SM4500S2F
pH	9.03	S.U.	AASHTO T289
Redox	242	mV	SM2580B
Soluble Soil Chlorides	695	mg/kg	AASHTO T291
Resistivity	265	Ω-cm	AASHTO T288

Note: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

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Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

Figure B-12

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: June 13, 2016

LABORATORY NO: 16-4129-2

CLIENT: GES
7150 Placid St
Las Vegas, NV 89119

PAGE: 1 of 1

CLIENT PROJECT: 20153828E1

CLIENT PO #:

ANALYST: ET/CR

Sampled By: Client
Date Sampled: --
Time Sampled: --

Date Received: 06/08/16
Time Received: 1327

Sample ID: 16-233, B-7 @ 20'-21.5'

Analysis	Result	Unit	Method
Sodium (Na)	0.07	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	AASHTO T290
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.03	%	Calculation
Total Salts (Solubility)	0.15	%	SM2540C
Sulfide	<1.0	mg/kg	SM4500S2F
pH	8.57	S.U.	AASHTO T289
Redox	404	mV	SM2580B
Soluble Soil Chlorides	44.2	mg/kg	AASHTO T291
Resistivity	550	Ω-cm	AASHTO T288

Note: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3626 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

Figure B-13

Laboratory tests were conducted on representative soil samples for purposes of classification and evaluation of their engineering and physical properties. The amount and selection of the types of testing for a given study are based on the geotechnical conditions of the project. A summary of the various laboratory tests conducted for this project are presented below.

1. IN-PLACE MOISTURE CONTENT AND DENSITY

   The in-place moisture contents and the in-place dry densities of selected soil samples obtained from a thick-walled ring-lined sampler were evaluated. For each sample, the volume and wet weight of the sample were recorded. The samples were then oven-dried. After drying, the dry weight of each sample was measured, and the moisture contents and the subsequent dry densities were calculated. The in-place moisture content and dry density is a qualitative measure of consistency and compressibility. The moisture contents and dry densities of the sampled soils are presented at the respective sampling depth on the exploration logs in Appendix A.

2. GRAIN SIZE DISTRIBUTION

   Grain size distribution testing was performed by sieve analysis in general accordance with ASTM D6913. During the test soil samples are oven dried to a constant weight and sorted by a number of different sized sieves. The amount of material retained on each sieve is measured, the percent of material passing each sieve is computed and the test results are presented as particle size distribution curves. Results of the grain size distribution analysis performed for this study are presented on Figure B-1 through Figure B-7.

3. ATTERBERG LIMITS

   Selected soil samples were tested to evaluate Atterberg limits in general accordance with ASTM D4318. The liquid limit (LL) and plastic limit (PL) of tested samples were evaluated. The difference between the liquid limit and the plastic limit is the plasticity index (PI) and represents the range of water content over which the soil behaves in a plastic state. The term NP refers to non-plastic and the term NV refers to no value. Test results are presented on the boring logs in Appendix A.

4. STANDARD PROCTOR

   Standard proctor tests were performed on selected soil samples in general accordance with ASTM D698. The test procedure includes dropping of a 5-1/2-pound hammer through a

height of 18 inches on each of three soil layers in the compaction mold. The test results are shown on Figure B-8 through Figure B-9.

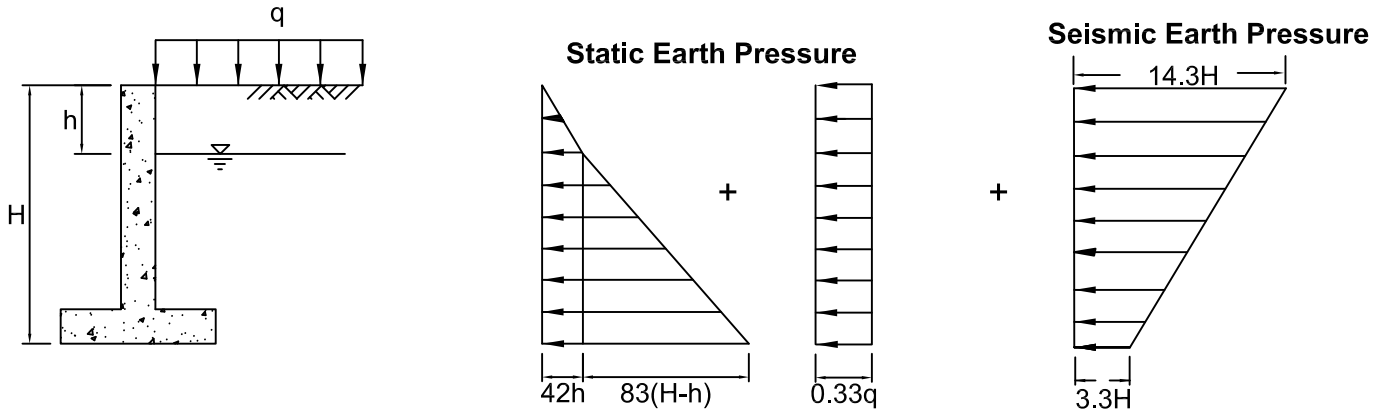
5. SWELL POTENTIAL

Swell potential tests were performed on soil samples obtained from a thick-walled ring-lined sampler in general accordance with Section 1803.5.3.2 of the SNA to the 2012 IBC. A vertical confining pressure of approximately 60 pounds per square foot was applied to each oven-dried sample and then the sample was inundated with water. The deformation of each sample was recorded until 3 consecutive readings were the same. The results of the swell tests are presented on Figure B-10.

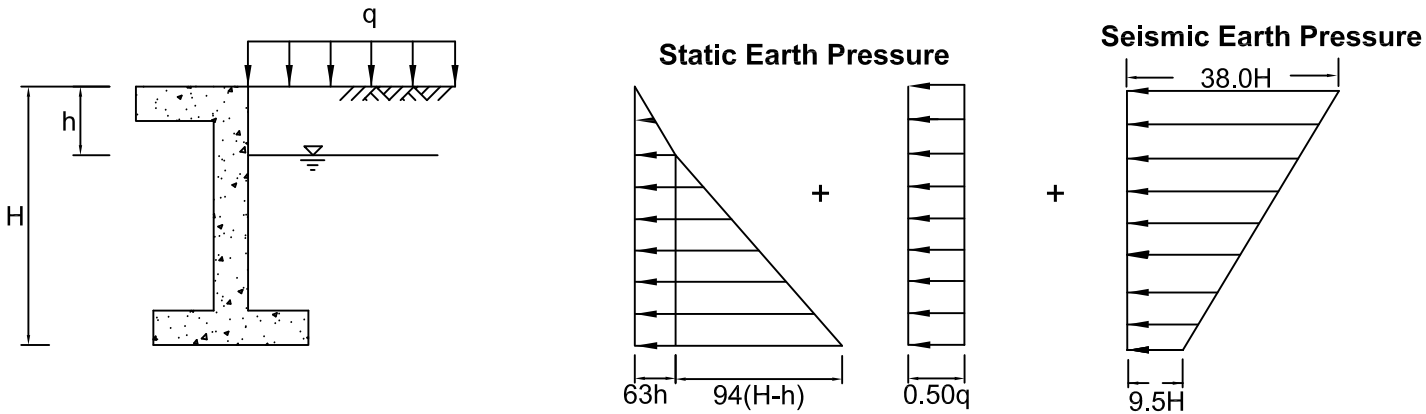
6. CORROSIVITY SUITE

Selected soil samples were tested with a suite of chemical corrosivity tests to aid in evaluating the potential for concrete degradation and corrosion of buried metal. The suites of chemical corrosivity testing included some or all of the following: sodium content, water soluble sulfate, total available water soluble sodium sulfate, total salts (solubility), sulfide content, pH, reduction-oxidation (red-ox) potential, and soluble soil chlorides. The tests were performed by Silver State Analytical Laboratories. The results of the tests are presented on Figure B-11 through Figure B-13.

APPENDIX C
DESIGN FIGURES



Active Condition



At-Rest Condition

Notes:
H is height of wall in feet.
h is depth to groundwater in feet.
q is magnitude of uniform surcharge load in pounds per square foot (psf).
Earth pressures are in psf.

NOT TO SCALE

GES
GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.
(702) 365-1001
7150 Placid Street
Las Vegas, NV 89119
www.gesnevada.com

LATERAL EARTH PRESSURE DIAGRAM
NELLIS RECLAIMED WATERLINE PROJECT
CLARK COUNTY, NEVADA

DRAWN BY:	REVIEWED BY:	DATE DRAWN:
MNS	DT	06/23/2016
PROJECT NO. 20153828E1		FIGURE C-1

j:\jobs\2015_jobs\20153828\e1\design figures\maps\figure c-1.dwg

Appendix C

Air Conformity Applicability Model (ACAM) Results

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: NELLIS AFB
County(s): Clark; Nye; Lincoln
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; NOT IN A REGULATORY AREA

- Action Title: Nellis Reclaimed Water Line

- Project Number/s (if applicable):

- Projected Action Start Date: 3 / 2018

- Action Purpose and Need:

The purpose of the proposed action is to provide reclaimed water for the existing irrigation system at the NAFB Golf Course. Currently SVGC relies on potable water pumped from three (3) wells for their irrigation needs. The demand for potable water in the Las Vegas Valley is growing as the population of the area is steadily increasing, while the replenishment of present water supplies is limited by recent periods of drought in the region. The proposed action is needed to fulfill the conditions set forth in the Enhanced Use Lease Agreement (EULA) between City of North Las Vegas (CNLV) and USAF, in which a reclaimed water line must be constructed to irrigate the SVGC. As part of the EULA, NAFB has provided land for the construction of a treatment facility, identified in this document as the City of North Las Vegas Water Reclamation Facility (CNLV-WRF). Utilizing reclaimed water for uses in which potable water is not necessary, such as irrigation for landscaping, will reduce the rate of aquifer depletion in the Las Vegas area, and allow more potable water to be available for applications in which it is necessary.

- Action Description:

The City of North Las Vegas proposes to construct and maintain approximately 12,100 linear feet of 10-inch diameter PVC reclaimed water main at one of two locations. The two sites being considered are shown on Figure 1. This reclaimed water main will be connected to the existing pump station at CNLV-WRF, and will supply two ponds, designated as Raptor and Eagle Ponds, located on the grounds of SVGC. Raptor Pond is located to the northwest of the SVGC clubhouse, and Eagle Pond is located to the northeast of the clubhouse. In order to construct the reclaimed water line, excavation and backfilling of earth between the CNLV-WRF and SVGC will be required. This excavation will be in the form of a trench, approximately two (2) feet wide, by five (5) feet deep, by 12,100 feet long. Based on these dimensions, between 4,400 and 5,000 cubic yards (yd3) of earth will be removed, depending on which route is selected. The trench will be built from CNLV-WRF to SVGC, with a branch to each pond. After construction and installation of the pipeline, the trench will be backfilled with excavated material and the disturbed vegetation returned to its existing condition or better. Alternative 2 is represented by Route B. This alignment was proposed by Greeley and Hansen, the engineering firm consulting on pipeline design and construction. The alignment starts at the northeast corner of the CNLVWRF, and runs to the north along the west side of the existing Sloan Channel. The alignment crosses the Sloan Channel and continues north to the SVGC grounds. The pipeline to Raptor Pond will continue to the west side of the Sloan Channel, and the pipeline to Eagle Pond will cross the Sloan-Range Wash near the confluence of the two washes at the fairway crossing. It will then remain on the south side of Range Wash, heading east, then south, between the existing tee and green to Eagle Pond. Route B follows the same path as a conduit alignment alternative that was considered, but not used, for the utility conduit used in Phase II of the solar photovoltaic power station at the south end of the Nellis AFB property. This alignment would be within as area that has been previously disturbed, but may have additional unknown subsurface utility conflicts which could increase the cost and duration of construction.

- Point of Contact

Name: Darla Guerrero
Title: Civilian
Organization: Greeley and Hansen
Email: dguerrero@greeley-hansen.com

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Phone Number: (702) 272-1898

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construct 12,100 LF of 10" diameter reclaimed water line along the Sloan Channel

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Clark; Nye; Lincoln
Regulatory Area(s): NOT IN A REGULATORY AREA; Clark Co, NV; Las Vegas, NV

- Activity Title: Construct 12,100 LF of 10" diameter reclaimed water line along the Sloan Channel

- Activity Description:
This excavation will be in the form of a trench, approximately two (2) feet wide, by five (5) feet deep, by 12,100 feet long. Based on these dimensions, between 4,400 and 5,000 cubic yards (yd3) of earth will be removed, depending on which route is selected. The trench will be built from CNLV-WRF to SVGC, with a branch to each pond. After construction and installation of the pipeline, the trench will be backfilled with excavated material and the disturbed vegetation returned to its existing condition or better. The construction of this pipeline will most likely utilize various motorized construction equipment such as water trucks, dump trucks, excavators, cement and mortar mixers, tractors, backhoes, front-end loaders, fork lifts, and generator sets. This equipment will be used to Excavate the trench for the pipeline alignment, install the pipe and conduit, backfill the trench, and repair/replace concrete or asphalt cart paths and roadways. The pipeline will utilize a jack and bore method for crossing of the Sloan Channel. This crossing would be fully encased with a minimum depth of 3.5 feet from the bottom of the channel, as suggested by Clark County Public Works standards. In the unlined channels at each pond, the water line will be constructed below the scouring depth and would be placed in a concrete encasement to mitigate the issue of erosional scour caused by flowing water.

ASSUMPTIONS:
-All construction activites will be continuous to replicate actual worst case scenario.
-All 3 alternatives differ by nearly neglibile values so one ACAM analysis was constructed to represent all 3 alternatives
-Based on map scaling, amount of paving is estimated to be a conservative 12,600 sq ft

Site Grading Calculation: General rule of thumb - double area
12,100 ft (long) X 2 ft (wide) X 2 = 48,400 sq ft

Trenching Calculation:
12,100 ft (long) X 2 ft (wide) - 24,200 sq ft

Paving:
Conservative value of 4,192 ft used to account for any roadway disturbances, assume 3 ft wide trenching on roadways
4,192 ft X 3 ft = 12,576 sq ft round up to 12,600 sq ft

- Activity Start Date
Start Month: 3
Start Month: 2018

- Activity End Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Indefinite: False
End Month: 11
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.755996
SO_x	0.009489
NO_x	4.933303
CO	4.144696
PM 10	6.739034

Pollutant	Total Emissions (TONs)
PM 2.5	0.238827
Pb	0.000000
NH_3	0.002288
CO_2e	922.0

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2018

- Phase Duration
Number of Month: 9
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 48400
Amount of Material to be Hauled On-Site (yd^3): 900
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1049	0.0014	0.7217	0.5812	0.0354	0.0354	0.0094	132.97
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0633	0.0012	0.4477	0.3542	0.0181	0.0181	0.0057	122.66
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2343	0.0024	1.8193	0.8818	0.0737	0.0737	0.0211	239.61
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0512	0.0007	0.3330	0.3646	0.0189	0.0189	0.0046	66.912

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.347	000.002	000.298	003.513	000.008	000.007		000.025	00352.061
LDGT	000.444	000.003	000.525	005.150	000.010	000.009		000.027	00454.877
HDGV	000.943	000.005	001.449	018.879	000.023	000.020		000.045	00797.765
LDDV	000.115	000.003	000.156	002.578	000.004	000.004		000.008	00344.974
LDDT	000.319	000.004	000.513	005.136	000.007	000.007		000.008	00501.756
HDDV	000.576	000.014	006.275	002.043	000.232	000.213		000.029	01554.144
MC	003.044	000.003	000.833	013.597	000.027	000.024		000.052	00395.604

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2018

- Phase Duration
Number of Month: 9
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 24200
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 5000

- Trenching Default Settings

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1049	0.0014	0.7217	0.5812	0.0354	0.0354	0.0094	132.97
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0633	0.0012	0.4477	0.3542	0.0181	0.0181	0.0057	122.66
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2343	0.0024	1.8193	0.8818	0.0737	0.0737	0.0211	239.61
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0512	0.0007	0.3330	0.3646	0.0189	0.0189	0.0046	66.912

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.347	000.002	000.298	003.513	000.008	000.007		000.025	00352.061
LDGT	000.444	000.003	000.525	005.150	000.010	000.009		000.027	00454.877
HDGV	000.943	000.005	001.449	018.879	000.023	000.020		000.045	00797.765
LDDV	000.115	000.003	000.156	002.578	000.004	000.004		000.008	00344.974
LDDT	000.319	000.004	000.513	005.136	000.007	000.007		000.008	00501.756
HDDV	000.576	000.014	006.275	002.043	000.232	000.213		000.029	01554.144
MC	003.044	000.003	000.833	013.597	000.027	000.024		000.052	00395.604

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.3 Paving Phase

2.3.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2018

- Phase Duration
Number of Month: 9
Number of Days: 0

2.3.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 12600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.3.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1049	0.0014	0.7217	0.5812	0.0354	0.0354	0.0094	132.97
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0633	0.0012	0.4477	0.3542	0.0181	0.0181	0.0057	122.66
Rubber Tired Dozers Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2343	0.0024	1.8193	0.8818	0.0737	0.0737	0.0211	239.61
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0512	0.0007	0.3330	0.3646	0.0189	0.0189	0.0046	66.912

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.347	000.002	000.298	003.513	000.008	000.007		000.025	00352.061
LDGT	000.444	000.003	000.525	005.150	000.010	000.009		000.027	00454.877
HDGV	000.943	000.005	001.449	018.879	000.023	000.020		000.045	00797.765
LDDV	000.115	000.003	000.156	002.578	000.004	000.004		000.008	00344.974
LDDT	000.319	000.004	000.513	005.136	000.007	000.007		000.008	00501.756
HDDV	000.576	000.014	006.275	002.043	000.232	000.213		000.029	01554.144
MC	003.044	000.003	000.833	013.597	000.027	000.024		000.052	00395.604

2.3.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

Appendix D

Notice of Availability

PUBLIC NOTICE

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT AND
PROPOSED FINDING OF NO SIGNIFICANT IMPACT
FOR CONSTRUCTION OF A RECLAIMED WATER LINE AT NELLIS AFB, NEVADA

An Environmental Assessment (EA) has been prepared to analyze the impacts of the construction of a reclaimed water line on Nellis Air Force Base, Nevada. The purpose of this project is to provide a source of reclaimed water to the Nellis AFB Golf Course, and decrease the base's use of potable water in uses where it is not necessary. The Air Force would utilize a buried 10-inch PVC line, and an automated pumping system to drive water to the golf course. These are proposed for construction in Las Vegas, Nevada.

The EA, prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, and Air Force instructions implementing NEPA; evaluates potential impacts of the alternative actions on the environment including the No-action Alternative. Based on this analysis, the Air Force has prepared a proposed Finding of No Significant Impact (FONSI).

The Draft EA and proposed FONSI, dated June, 2017, are available for review at the following locations:

Las Vegas Library Reference Department 833 Las Vegas Blvd. North Las Vegas, NV 89101	Nevada State Clearinghouse Division of State Lands Carson City, NV 89701

Electronic copies of the documents can also be found on the Nellis AFB website at http://www.nellis.af.mil/About/Environment.aspx

You are encouraged to submit comments through June 2017. Comments should be provided to Tod Oppenborn, 99 ABW/PA, 4430 Grissom Ave., Suite 107, Nellis AFB, Nevada 89191.

PRIVACY ADVISORY NOTICE

Public comments on this Draft EA are requested pursuant to NEPA, 42 United States Code 4321, et seq. All written comments received during the comment period will be made available to the public and considered during the final EA preparation. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. However, address information will be used to compile the project mailing list and failure to provide it will result in your name not being included on the mailing list.

Appendix E

Nevada Natural Heritage Program Results

Data Sensitive and At Risk Taxa Recorded Near the Nellis AFB Reclaimed Water Line Project Area

Compiled by the Nevada Natural Heritage Program for Geotechnical and Environmental Services, Inc.
18 March 2016

Scientific name	Common name	Usfws	Blm	Usfs	State	Srank	Grank	UTM E	UTM N	Loc Uncert	Uncert Dist	Last Obs
Plants												
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672502.26	4009839.38	161	Meters	2005-06-07
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	674206.37	4012062.12	500	Meters	1998-SUM
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673624.68	4013816.15	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672240.99	4013912.89	20	Meters	2002-12-05
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673919.32	4014747.52	15	Meters	1995-05-22
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672758.27	4014629.55	15	Meters	1998-10-15
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672426.46	4014144.04	15	Meters	1993-05-24
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673106.74	4014360.53	15	Meters	1998-10-15
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672221.25	4013687.61	0	Meters	2008-01-02
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672160.87	4013842.67	0	Meters	2002-12-05
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	674683.05	4013080.73	0	Meters	2006-08-31
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673657.15	4014079.49	0	Meters	2006-08-31
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673572.03	4013480.90	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673586.71	4013571.11	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673594.54	4013655.68	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673618.06	4013735.64	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673631.54	4013860.17	20	Meters	2006-SP
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	673596.99	4014153.82	20	Meters	2005-03-25
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672682.64	4014176.27	20	Meters	2005-06-10
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	672032.77	4014291.58	20	Meters	2005-06-10
Arctomecon californica	Las Vegas bearpoppy		S		CE	S3	G3	674832.60	4013215.38	161	Meters	1997-05
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672588.99	4012630.43	20	Meters	2006-pre
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673586.71	4013571.11	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673631.54	4013860.17	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673893.11	4013578.44	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673642.41	4014301.46	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672371.59	4013578.11	10	Meters	1998-10-13
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672583.30	4015181.27	20	Meters	2006-pre
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673119.57	4014328.65	20	Meters	2006-pre
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672221.25	4013687.61	0	Meters	2008-01-02
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673200.28	4014088.77	220	Meters	1999-12-04
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673572.03	4013480.90	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673579.74	4013537.48	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673594.54	4013655.68	20	Meters	2006-SP

Scientific name	Common name	Usfws	Blm	Usfs	State	Srank	Grank	UTM E	UTM N	Loc Uncert	Uncert Dist	Last Obs
Plants (cont.)												
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673618.06	4013735.64	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673624.68	4013816.15	20	Meters	2006-SP
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	674683.53	4013088.00	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	674874.68	4013380.38	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673927.51	4013497.73	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673328.89	4013458.07	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673238.93	4013571.18	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673385.10	4013966.09	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673209.15	4014193.65	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673989.67	4014646.74	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	674065.73	4014900.75	0	Meters	2006-08-31
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672684.98	4014789.07	10	Meters	1998-10-15
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	673146.94	4014404.84	10	Meters	1998-10-16
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	672657.90	4012710.30	10	Meters	1998-10-13
Eriogonum corymbosum var. *nilesii*	Las Vegas buckwheat		S			S1S2	G5T2	671505.99	4013486.58	500	Meters	1998-10-15
Mammals												
Euderma maculatum	spotted bat		S	R4S	TM	S2	G4	670941.10	4008006.89	100	Meters	1990-03-29
Birds												
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2009-04-15
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2009-03-20
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2009-03-20
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2009-03-20
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-11-01
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-06-13
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-06-12
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-06-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-18
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2009-03-30
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-04
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-04
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-04
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2008-04-04
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-04

Scientific name	Common name	Usfws	Blm	Usfs	State	Srank	Grank	UTM E	UTM N	Loc Uncert	Uncert Dist	Last Obs
Birds (cont.)												
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-11
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2009-03-20
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-04-04
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2008-02-01
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-15
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-16
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	20	Meters	2006-06-15
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-05-08
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-05-08
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-16
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	401XXXX	100	Meters	2006-06-14
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-14
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-16
Athene cunicularia hypugaea	Western Burrowing Owl		S			S3B	G4T4	67XXXX	400XXXX	20	Meters	2006-06-14

Bureau of Land Management (Blm) Species Classification:

S Sensitive Species- Species designated Sensitive by State Director of Nevada BLM

United States Forest Service (Usfs) Species Classification:

R4S Region 4 (Humboldt-Toiyabe National Forest) Sensitive

Nevada State Protected (State) Species Classification:

Fauna:

TM Threatened Mammal (NAC 503.030.2)

Flora:

CE Critically endangered - species whose survival requires assistance because of overexploitation, disease or other factors, or because their habitat is threatened with destruction, drastic modification or severe curtailment (NRS 527.260-.300)

Locational Uncertainty:

Based on the uncertainty associated with the underlying information on the location of the observation.

Estimated uncertainty varies in more than one dimension; true location of the observation can be visualized as floating within an area for which boundaries cannot be specifically delimited

Nevada Natural Heritage Program Global (**Grank**) and State (**Srank**) Ranks for Threats and/or Vulnerability:

G Global rank indicator, based on worldwide distribution at the species level
T Global trinomial rank indicator, based on worldwide distribution at the infraspecific level
S State rank indicator, based on distribution within Nevada at the lowest taxonomic level
- l Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats, or other factors
- 2 Imperiled due to rarity or other demonstrable factors
- 3 Vulnerable to decline because rare and local throughout its range, or with very restricted range
- 4 Long-term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery
- 5 Demonstrably secure, widespread, and abundant
  - A Accidental within Nevada
  - B Breeding status within Nevada (excludes resident taxa)
  - H Historical; could be rediscovered
  - N Non-breeding status within Nevada (excludes resident taxa)
  - Q Taxonomic status uncertain
  - U Unrankable
  - Z Enduring occurrences cannot be defined (usually given to migrant or accidental birds)
  - ? Assigned rank uncertain

Appendix F

EDR Radius Report

Nellis AFB
36.21314081968974, -115.05188245524843
Prepared for: CNLV
Ref: CNLV Reclaimed Water Line

Tuesday, December 27, 2016

Environmental Radius Report

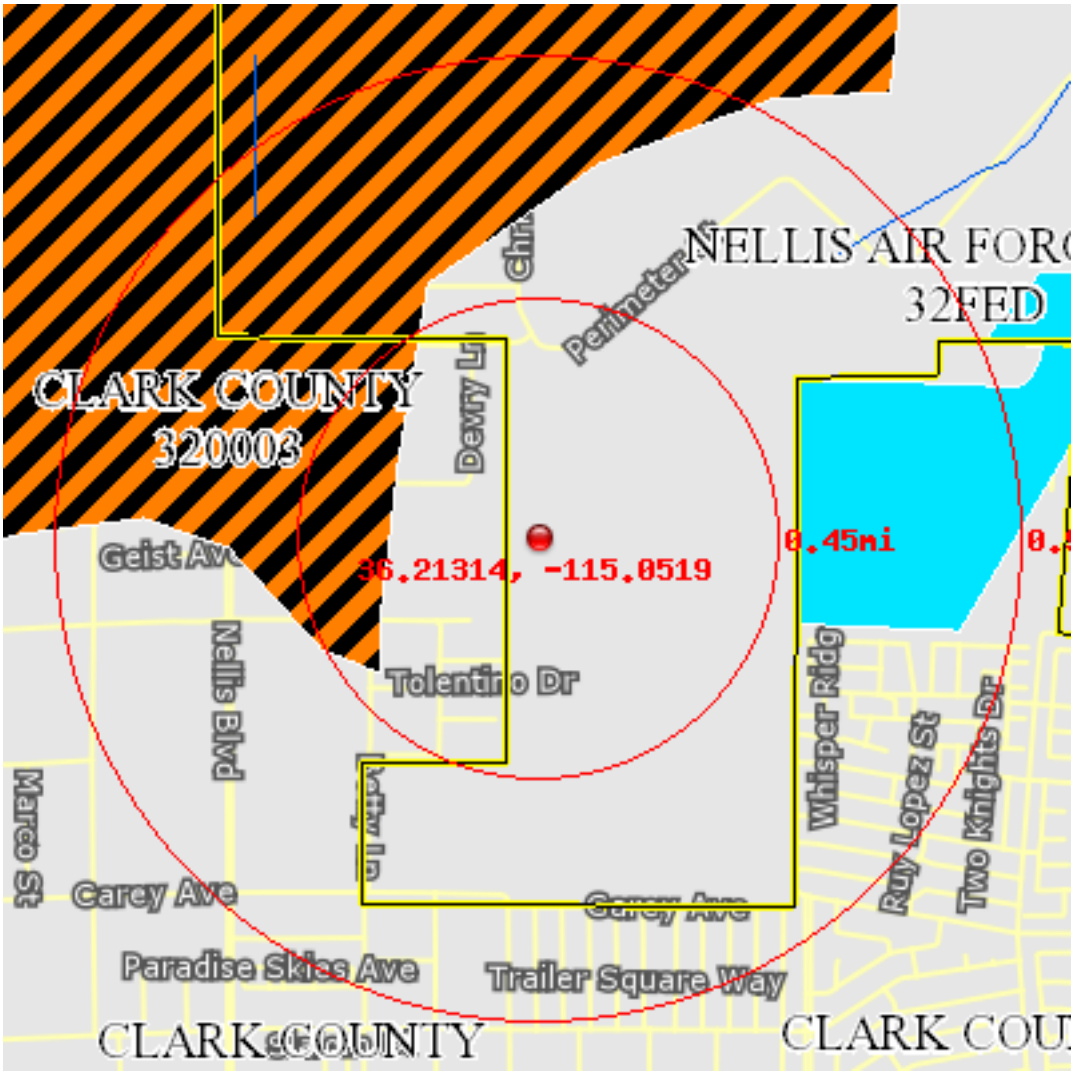
2055 E. Rio Salado Pkwy
Tempe, AZ 85381
480-967-6752

Summary

Flood Zones Hazard Map Federal Emergency Management Agency (FEMA)

	< 1/4	1/4 - 1/2	1/2 - 1
National Priorities List (NPL)			
CERCLIS List			
CERCLIS NFRAP			
RCRA CORRACTS Facilities			
RCRA non-CORRACTS TSD Facilities			
Federal Institutional Control / Engineering Control Registry			
Emergency Response Notification System (ERNS)			
US Toxic Release Inventory			
US RCRA Generators (CESQG, SQG, LQG)			5
US ACRES (Brownfields)			
US NPDES			1
US Air Facility System (AIRS / AFS)			2
NV Underground Storage Tanks			19
NV Leaking Underground Storage Tanks			
NV Open Solid Waste Facilities			
NV Closed Solid Waste Facilities	1	1	

Flood Hazard Zones Map



- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area with Reduced Risk Due to Levee

National Priorities List (NPL)

This database returned no results for your area.

The Superfund Program, administered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is an EPA Program to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. The NPL (National Priorities List) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. The boundaries of an NPL site are not tied to the boundaries of the property on which a facility is located. The release may be contained with a single property's boundaries or may extend across property boundaries onto other properties. The boundaries can, and often do change as further information on the extent and degree of contamination is obtained.

CERCLIS List

This database returned no results for your area.

The United States Environmental Protection Agency (EPA) investigates known or suspected uncontrolled or abandoned hazardous substance facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA maintains a comprehensive list of these facilities in a database known as the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). These sites have either been investigated or are currently under investigation by the EPA for release or threatened release of hazardous substances. Once a site is placed in CERCLIS, it may be subjected to several levels of review and evaluation and ultimately placed on the National Priority List (NPL).

CERCLIS sites designated as "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an intitial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration.

CERCLIS NFRAP

This database returned no results for your area.

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" NFRAP have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the site being placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.
EPA has removed these NFRAP sites from CERCLIS to lift unintended barriers to the redevelopment of these properties. This policy change is part of EPA"s Brownfields Redevelopment Program to help cities, states, private investors and affected citizens promote economic redevelopment of unproductive urban sites.

RCRA CORRACTS Facilities

This database returned no results for your area.

The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). The EPA maintains the Corrective Action Report (CORRACTS) database of Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action." A "corrective action order" is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility"s boundary and can be required regardless of when the release occurred, even if it predated RCRA.

RCRA non-CORRACTS TSD Facilities

This database returned no results for your area.

The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). The EPA''s RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilites database is a compilation by the EPA of facilities that report generation, storage, transportation, treatment, or disposal of hazardous waste. RCRA Permitted Treatment, Storage, Disposal Facilities (RCRA-TSD) are facilities which treat, store and/or dispose of hazardous waste.

Federal Institutional Control / Engineering Control Registry

This database returned no results for your area.

Federal Institutional Control / Engineering Control Registry

Emergency Response Notification System (ERNS)

This database returned no results for your area.

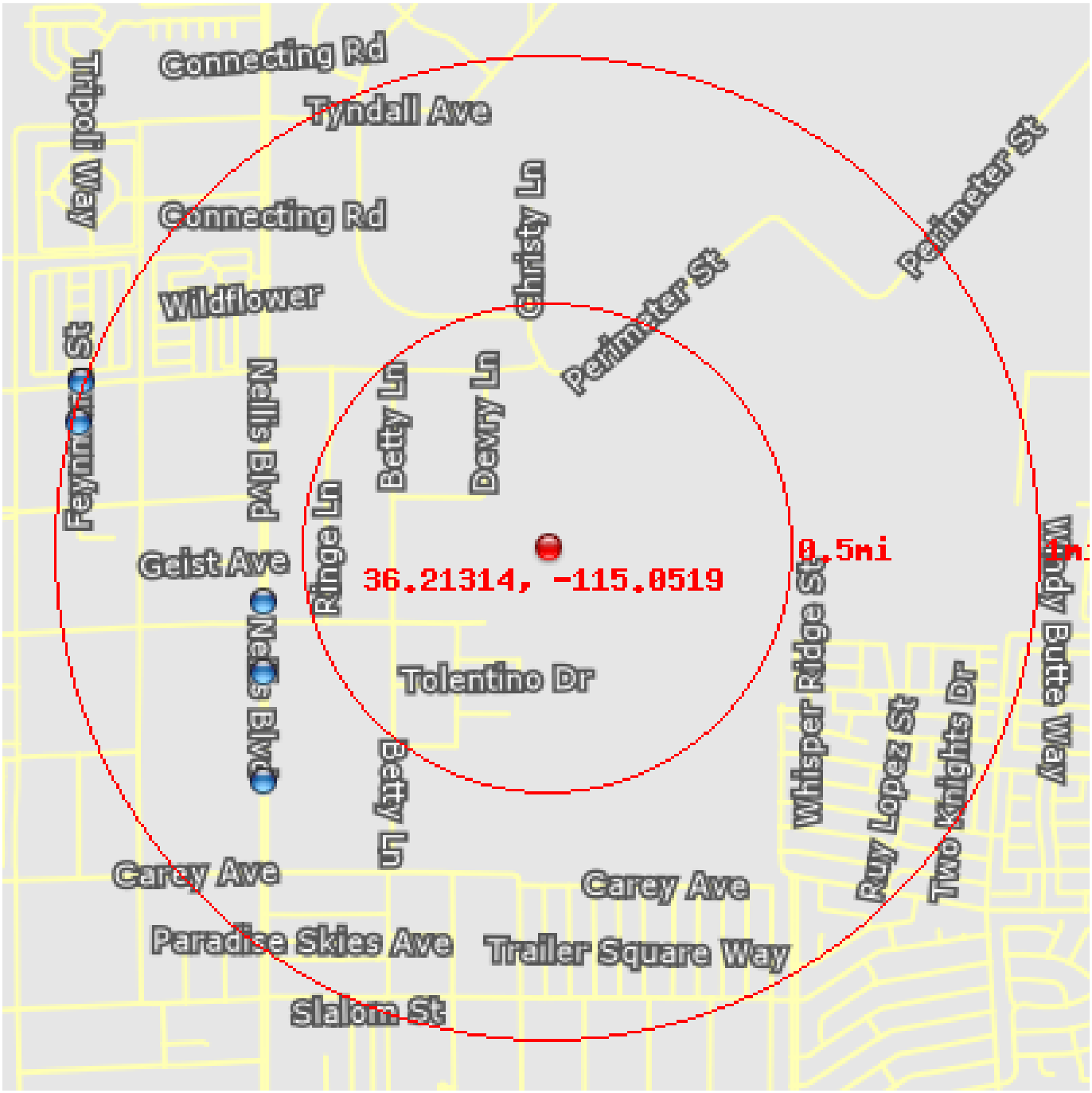
The Emergency Response Notification System (ERNS) is a national computer database used to store information on unauthorized releases of oil and hazardous substances. The program is a cooperative effort of the Environmental Protection Agency, the Department of Transportation Research and Special Program Administration''s John Volpe National Transportation System Center and the National Response Center. There are primarily five Federal statutes that require release reporting: the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) section 103; the Superfund Amendments and Reauthorization Act(SARA) Title III Section 304; the Clean Water Act of 1972(CWA) section 311(b)(3); and the Hazardous Material Transportation Act of 1974(HMTA section 1808(b).

US Toxic Release Inventory

This database returned no results for your area.

The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. TRI reporters for all reporting years are provided in the file.

US RCRA Generators (CESQG, SQG, LQG)



This database returned 5 results for your area.

The United States Environmental Protection Agency (EPA) regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). EPA maintains a database of facilities, which generate hazardous waste or treat, store, and/or dispose of hazardous wastes.

Conditionally Exempt Small Quantity Generators (CESQG) generate 100 kilograms or less per month of hazardous waste, or 1 kilogram or less per month of acutely hazardous waste.

Small Quantity Generators (SQG) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Large Quantity Generators (LQG) generate 1,000 kilograms per month or more of hazardous waste, or more than 1 kilogram per month of acutely hazardous waste.

US RCRA Generators (CESQG, SQG, LQG)

Location	36.21144, -115.0621
Distance to site	3087 ft / 0.58 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110001564021*
EPA Identifier	110001564021
Primary Name	WESTERN STATES CONTRACTING, INC.
Address	2810 N NELLIS BLVD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
NAICS Codes	236210
SIC Codes	1522, PRIV
SIC Descriptions	GENERAL CONTRACTORS-RESIDENTIAL BUILDINGS, OTHER THAN SINGLE-FAMILY
Programs	AIRS/AFS, RCRAINFO
Program Interests	AIR MINOR, CESQG
Updated On	30-APR-14
Recorded On	01-MAR-00
NAICS Descriptions	INDUSTRIAL BUILDING CONSTRUCTION.
Program ID	32003R9674

Location	36.2094, -115.0621
Distance to site	3318 ft / 0.63 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110004303619*
EPA Identifier	110004303619
Primary Name	INQUIPCO
Address	2730 N NELLIS BLVD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
Programs	RCRAINFO
Program Interests	CESQG
Updated On	27-JAN-12
Recorded On	01-MAR-00
Program ID	NVR000001958

US RCRA Generators (CESQG, SQG, LQG)

Location	36.20623, -115.0621
Distance to site	3937 ft / 0.75 mi SW
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110004300569*
EPA Identifier	110004300569
Primary Name	BRYAN PAINTING AND SANDBLASTING INC
Address	2550 N NELLIS BLVD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
Programs	RCRAINFO
Program Interests	CESQG
Updated On	27-JAN-12
Recorded On	01-MAR-00
Program ID	NVD986774958

Location	36.21671, -115.0689
Distance to site	5174 ft / 0.98 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110040098685*
EPA Identifier	110040098685
Primary Name	ERICKSON INTERNATIONAL LLC
Address	3135 MARCO ST
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
NAICS Codes	326113
Programs	BR, RCRAINFO
Program Interests	HAZARDOUS WASTE BIENNIAL REPORTER, LQG
Updated On	21-MAR-12
Recorded On	03-DEC-09
NAICS Descriptions	UNLAMINATED PLASTICS FILM AND SHEET (EXCEPT PACKAGING) MANUFACTURING.
Program ID	NVR000084996

US RCRA Generators (CESQG, SQG, LQG)

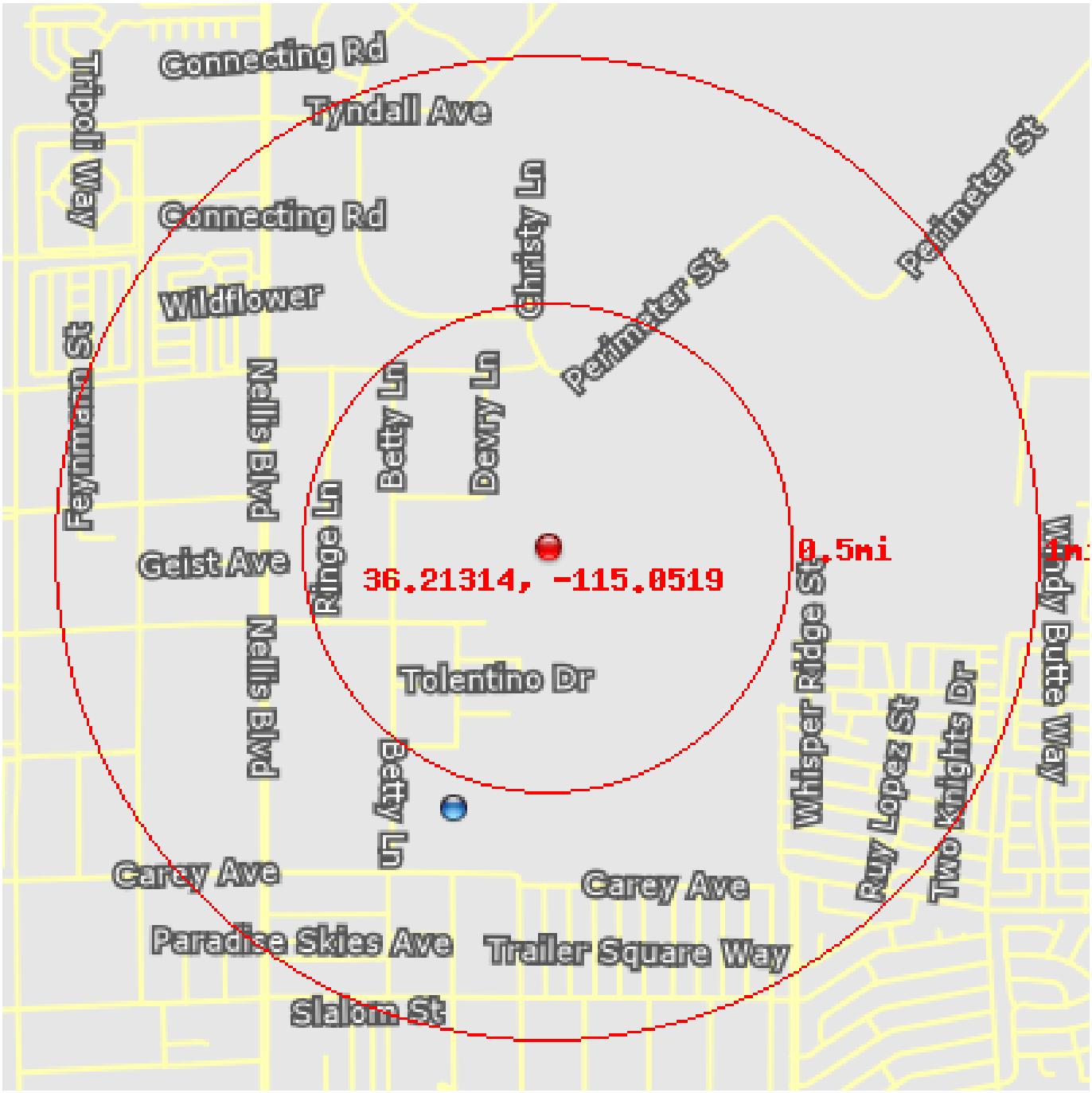
Location	36.21788, -115.0687
Distance to site	5255 ft / 1 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110032964451*
EPA Identifier	110032964451
Primary Name	HD SUPPLY FACILITIES MAINTENANCE LTD
Address	4825 E CHEYENNE RD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
NAICS Codes	454113
Programs	RCRAINFO
Program Interests	CESQG
Updated On	27-JAN-12
Recorded On	07-JAN-08
NAICS Descriptions	MAIL-ORDER HOUSES.
Program ID	NVR000082768

US ACRES (Brownfields)

This database returned no results for your area.

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. The Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an online database for Brownfields Grantees to electronically submit data directly to The United States Environmental Protection Agency (EPA)

US NPDES



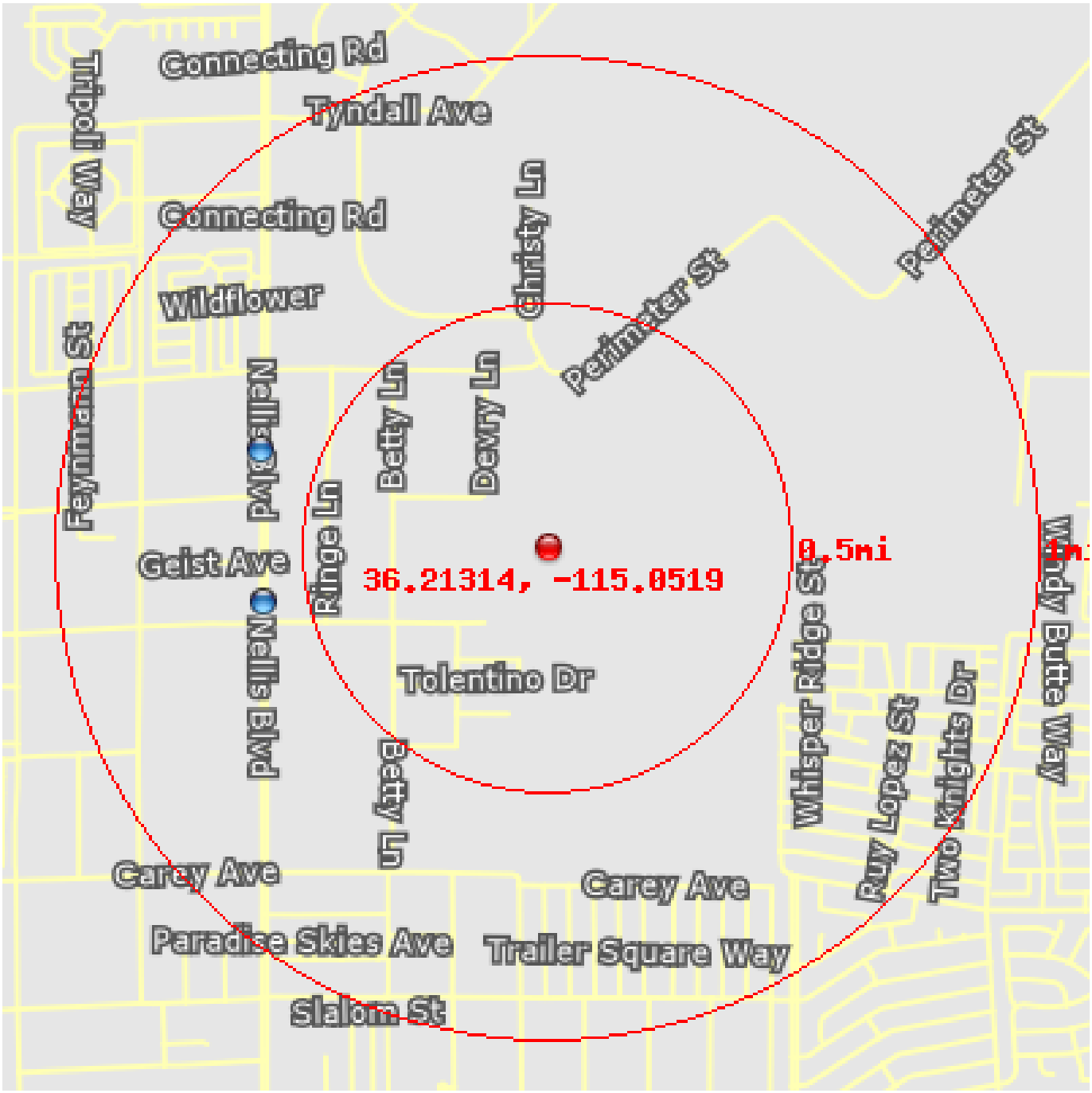
This database returned 1 results for your area.

The NPDES module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

US NPDES

Location	36.2054, -115.0552
Distance to site	2991 ft / 0.57 mi SW
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110041936466*
EPA Identifier	110041936466
Primary Name	CITY OF NORTH LAS VEGAS WATER RECLAMATION FACILITY
Address	APN 14016401007
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89156
SIC Codes	4952
SIC Descriptions	SEWERAGE SYSTEMS
Programs	NPDES
Program Interests	NPDES MAJOR
Updated On	05-MAR-13
Recorded On	31-AUG-10
Program ID	NV0023647

US Air Facility System (AIRS / AFS)



This database returned 2 results for your area.

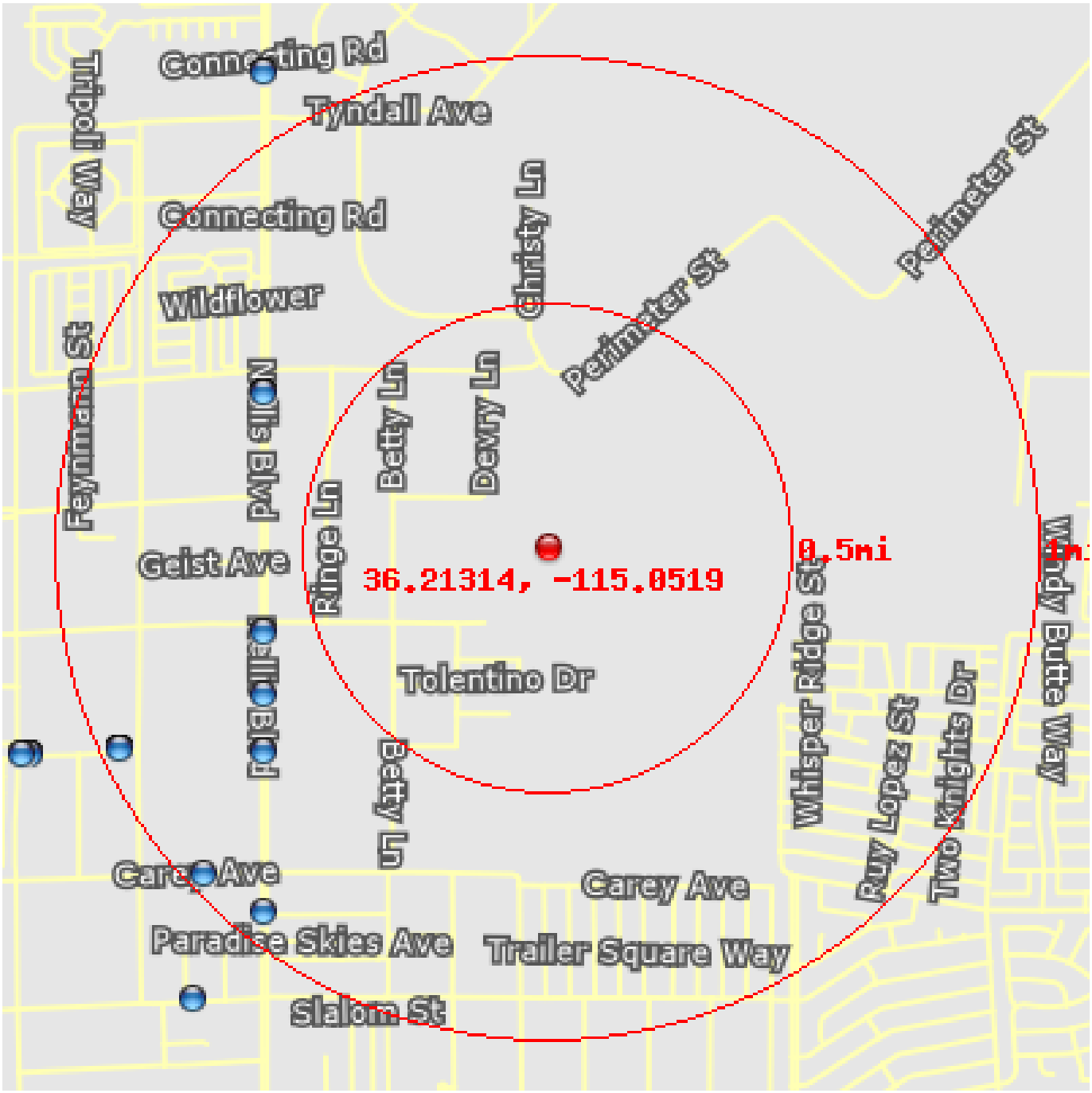
The Air Facility System (AIRS / AFS) contains compliance and permit data for stationary sources of air pollution (such as electric power plants, steel mills, factories, and universities) regulated by EPA, state and local air pollution agencies. The information in AFS is used by the states to prepare State Implementation Plans (SIPs) and to track the compliance status of point sources with various regulatory programs under Clean Air Act.

US Air Facility System (AIRS / AFS)

Location	36.21144, -115.0621
Distance to site	3087 ft / 0.58 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110001564021*
EPA Identifier	110001564021
Primary Name	WESTERN STATES CONTRACTING, INC.
Address	2810 N NELLIS BLVD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
NAICS Codes	236210
SIC Codes	1522, PRIV
SIC Descriptions	GENERAL CONTRACTORS-RESIDENTIAL BUILDINGS, OTHER THAN SINGLE-FAMILY
Programs	AIRS/AFS, RCRAINFO
Program Interests	AIR MINOR, CESQG
Updated On	30-APR-14
Recorded On	01-MAR-00
NAICS Descriptions	INDUSTRIAL BUILDING CONSTRUCTION.
Program ID	32003R9674

Location	36.21589, -115.0623
Distance to site	3219 ft / 0.61 mi W
Info URL	*http://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110038968436*
EPA Identifier	110038968436
Primary Name	D&R PRINTING & HOT STAMPING
Address	3067 N. NELLIS BLVD
City	LAS VEGAS
County	CLARK
State	NV
Zipcode	89115
NAICS Codes	221112
SIC Codes	2752, PRIV
SIC Descriptions	COMMERCIAL PRINTING, LITHOGRAPHIC
Programs	AIRS/AFS
Program Interests	AIR MINOR
Updated On	30-APR-14
Recorded On	01-JUL-09
NAICS Descriptions	FOSSIL FUEL ELECTRIC POWER GENERATION.
Program ID	32003R9333

NV Underground Storage Tanks



This database returned 19 results for your area.

Underground Storage Tanks (UST) containing hazardous or petroleum substances are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The Nevada Division of Environmental Protection, Bureau of Corrective Actions maintains a list of federally regulated USTs. In addition, some of the storage tanks included in the "Tank" list are not federally regulated USTs. These tanks are identified under the "Federally Regulated Tank" column as "False". Examples of non-regulated tanks include Aboveground Storage Tanks (ASTs), farm tanks, residential tanks, etc.

NV Underground Storage Tanks

Location	36.21063, -115.0622
Distance to site	3175 ft / 0.6 mi W
Facility Name	M & M CONSTRUCTION, INC.
Address	2780 NORTH NELLIS BLVD.
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1982-01-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Permanently Out of Use
Substance	Diesel
Tank Material	Asphalt Coated or Bare Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-001062
Tank ID	2

Location	36.21063, -115.0622
Distance to site	3175 ft / 0.6 mi W
Facility Name	M & M CONSTRUCTION, INC.
Address	2780 NORTH NELLIS BLVD.
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1982-01-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Permanently Out of Use
Substance	Diesel
Tank Material	Asphalt Coated or Bare Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-001062
Tank ID	1

NV Underground Storage Tanks

Location	36.20878, -115.0622
Distance to site	3429 ft / 0.65 mi SW
Facility Name	NELLIS BUILDING MATERIALS, INC
Address	2680 NORTH NELLIS BLVD.
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	2003-01-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently In Use
Substance	Diesel
Tank Material	Asphalt Coated or Bare Steel
Tank Contaminant	Excavation Liner
Pipe Material	Bare Steel
Facility ID	8-002081
Tank ID	1

Location	36.21758, -115.0622
Distance to site	3434 ft / 0.65 mi NW
Facility Name	REBEL OIL #39
Address	3191 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89102
Date Installed	1985-04-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently in Use
Substance	Gasohol
Tank Material	Epoxy Coated Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000522
Tank ID	2

NV Underground Storage Tanks

Location	36.21758, -115.0622
Distance to site	3434 ft / 0.65 mi NW
Facility Name	REBEL OIL #39
Address	3191 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89102
Date Installed	1985-04-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently in Use
Substance	Gasoline
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000522
Tank ID	1

Location	36.21758, -115.0622
Distance to site	3434 ft / 0.65 mi NW
Facility Name	REBEL OIL #39
Address	3191 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89102
Date Installed	1985-04-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently in Use
Substance	Gasohol
Tank Material	Epoxy Coated Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000522
Tank ID	5

NV Underground Storage Tanks

Location	36.21758, -115.0622
Distance to site	3434 ft / 0.65 mi NW
Facility Name	REBEL OIL #39
Address	3191 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89102
Date Installed	1985-04-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently in Use
Substance	Gasohol
Tank Material	Epoxy Coated Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000522
Tank ID	3

Location	36.21758, -115.0622
Distance to site	3434 ft / 0.65 mi NW
Facility Name	REBEL OIL #39
Address	3191 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89102
Date Installed	1985-04-01
Pipe Containment	None
Capacity in Gallons	12000
Status	Currently in Use
Substance	Gasohol
Tank Material	Epoxy Coated Steel
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000522
Tank ID	4

NV Underground Storage Tanks

Location	36.20713, -115.0622
Distance to site	3744 ft / 0.71 mi SW
Facility Name	NEVADA CONSTRUCTION CLEANUP
Address	2745 NORTH NELLIS BOULEVARD
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1997-01-01
Pipe Containment	None
Capacity in Gallons	1500
Status	Permanently Out of Use
Substance	Used Oil
Tank Material	Asphalt Coated or Bare Steel
Tank Contaminant	None
Pipe Material	No Piping
Facility ID	8-001891
Tank ID	1

Location	36.20712, -115.0622
Distance to site	3746 ft / 0.71 mi SW
Facility Name	WEAVER CONSTRUCTION
Address	2590 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1983-05-09
Pipe Containment	None
Capacity in Gallons	8000
Status	Currently in Use
Substance	Diesel
Tank Material	Fiberglass Reinforced Plastic
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000498
Tank ID	1

NV Underground Storage Tanks

Location	36.2024, -115.0622
Distance to site	4953 ft / 0.94 mi SW
Facility Name	GCR TIRE CENTER
Address	2350 N NELLIS BLVD
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1991-01-01
Pipe Containment	None
Capacity in Gallons	10000
Status	Temporarily Out of Use
Substance	Diesel
Tank Material	Fiberglass Reinforced Plastic
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-001060
Tank ID	1

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	Double-Walled
Capacity in Gallons	10000
Status	Currently in Use
Substance	Diesel
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	1

NV Underground Storage Tanks

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1985-12-09
Pipe Containment	Double-Walled
Capacity in Gallons	12000
Status	Currently in Use
Substance	Diesel
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	5

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	None
Capacity in Gallons	8000
Status	Temporarily Out of Use
Substance	New Oil
Tank Material	Fiberglass Reinforced Plastic
Tank Contaminant	None
Pipe Material	Fiberglass Reinforced Plastic
Facility ID	8-000348
Tank ID	7

NV Underground Storage Tanks

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	Double-Walled
Capacity in Gallons	10000
Status	Currently in Use
Substance	Diesel
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	4

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	Double-Walled
Capacity in Gallons	10000
Status	Currently in Use
Substance	Diesel
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	2

NV Underground Storage Tanks

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	Double-Walled
Capacity in Gallons	10000
Status	Currently in Use
Substance	Gasoline
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	3

Location	36.20715, -115.0673
Distance to site	5052 ft / 0.96 mi W
Facility Name	RIVER CITY PETROLEUM
Address	4870 E CARTIER AVENUE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1986-07-01
Pipe Containment	Double-Walled
Capacity in Gallons	10000
Status	Currently in Use
Substance	Gasoline
Tank Material	Composite (Steel w/ FRP)
Tank Contaminant	None
Pipe Material	Flexible Plastic
Facility ID	8-000348
Tank ID	6

NV Underground Storage Tanks

Location	36.20354, -115.0643
Distance to site	5068 ft / 0.96 mi SW
Facility Name	HIGHWAY RENTALS
Address	5005 E CAREY AVE
City	LAS VEGAS
State	NV
Zip Code	89115
Date Installed	1980-01-01
Pipe Containment	None
Capacity in Gallons	4000
Status	Permanently Out of Use
Substance	Other
Tank Material	Asphalt Coated or Bare Steel
Tank Contaminant	None
Pipe Material	Not Listed
Facility ID	8-001513
Tank ID	1

NV Leaking Underground Storage Tanks

This database returned no results for your area.

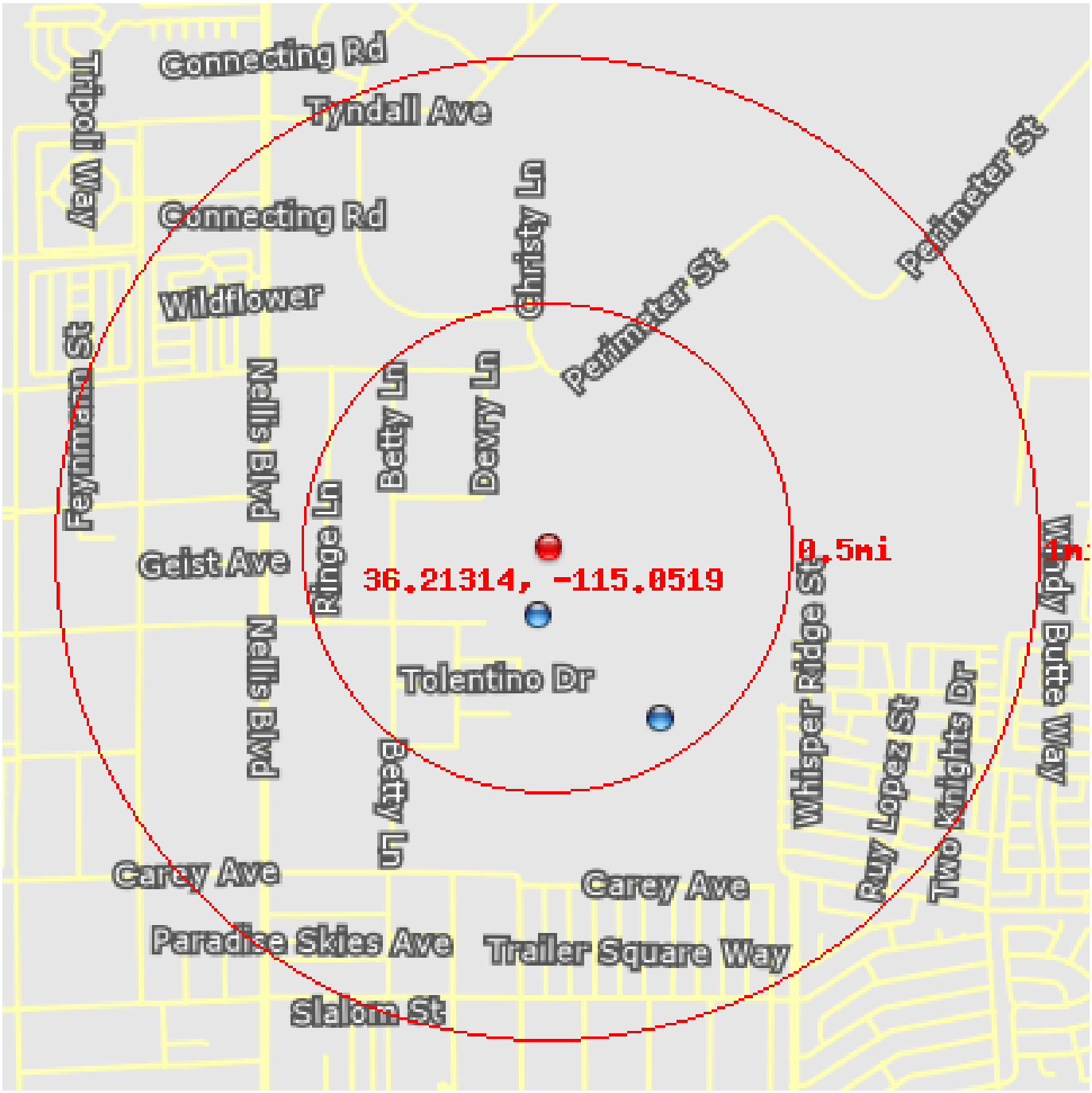
Information on Leaking Underground Storage Tanks (LUST) containing hazardous or petroleum substances is maintained by the Nevada Division of Environmental Protection Bureau of Corrective Actions. This database includes both LUST cases as well as Corrective Action (non-regulated) sites.

NV Open Solid Waste Facilities

This database returned no results for your area.

The Nevada Division of Environmental Protection, Bureau of Waste Management oversees the Permitting of Solid Waste Landfills and other waste management facilities within the state of Nevada. The counties of Clark and Washoe administer permitting programs for landfills and waste management facilities within their jurisdiction. The Bureau of Waste Managment maintains a database of Open Solid Waste Facilities.

NV Closed Solid Waste Facilities



This database returned 2 results for your area.

The Nevada Division of Environmental Protection, Bureau of Waste Management oversees the Permitting of Solid Waste Landfills and other waste management facilities within the state of Nevada. The counties of Clark and Washoe administer permitting programs for landfills and waste management facilities within their jurisdiction. The Bureau of Waste Managment maintains a database of Closed Solid Waste Facilities.

NV Closed Solid Waste Facilities

Location	36.21107, -115.0522
Distance to site	763 ft / 0.14 mi S
Facility Name	Nellis AFB Landfill #3
County	Clark
Facility Type	Class III

Location	36.20804, -115.0477
Distance to site	2226 ft / 0.42 mi SE
Facility Name	Nellis AFB Landfill #1
County	Clark
Facility Type	Class II

Appendix G

Draft Unanticipated Artifact Discovery Plan

PLAN AND PROCEDURES FOR THE UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

NELLIS AFB RECLAIMED WATERLINE PROJECT, CLARK COUNTY, NEVADA

1. INTRODUCTION

The United States Air Force (USAF) plans to construct a line for reclaimed water on Nellis AFB project. The purpose of this project is to convey treated water from the North Las Vegas treatment facility to the Nellis AFB golf course. The following Unanticipated Discovery Plan (UDP) outlines procedures to follow, in accordance with state and federal laws, if archaeological materials or human remains are discovered.

2. RECOGNIZING CULTURAL RESOURCES

A cultural resource discovery could be prehistoric or historic. Examples include:

- An accumulation of shell, burned rocks, or other food related materials
- Bones or small pieces of bone,
- An area of charcoal or very dark stained soil with artifacts,
- Stone tools or waste flakes (i.e. an arrowhead, or stone chips),
- Clusters of tin cans or bottles, logging or agricultural equipment that appears to be older than 50 years,
- Buried railroad tracks, decking, or other industrial materials.

When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

STEP 1: STOP WORK. If any USAF employee, contractor or subcontractor believes that he or she has uncovered a cultural resource at any point in the project, all work adjacent to the discovery must stop. The discovery location should be secured at all times.

STEP 2: NOTIFY MONITOR. If there is an archaeological monitor for the project, notify that person. If there is a monitoring plan in place, the monitor will follow its provisions.

STEP 3: NOTIFY USAF PROJECT MANAGEMENT AND CULTURAL RESOURCES PROGRAM. Contact the USAF Project Manager and the Cultural Resources (CR) Program Manager:

USAF Project Manager:	CR Program Manager:
Name	Kish Lapierre
Number	(702) 652-5813
email	Kish.lapierre@us.af.mil

If you can't reach the CR Program manager, contact your project's assigned Cultural Resources Specialist or an alternate:

Assigned CR Specialist:	Alternate CR Specialist:
Name	Name
Number	Number
email	email

The Project Manager or the Cultural Resources Program will make all other calls and notifications.

If human remains are encountered, treat them with dignity and respect at all times. Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Do not call 911 or speak with the media.

4. FURTHER CONTACTS AND CONSULTATION

A. Project Manager's Responsibilities:

- Protect Find: The USAF Project Manager is responsible for taking appropriate steps to protect the discovery site. All work will stop in an area adequate to provide for the total security, protection, and integrity of the resource. Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site. Work in the immediate area will not resume until treatment of the discovery has been completed following provisions for treating archaeological/cultural material as set forth in this document.

- Direct Construction Elsewhere On-site: The USAF Project Manager may direct construction away from cultural resources to work in other areas prior to contacting the concerned parties.

- Contact CR Manager: If the CR Program Manager has not yet been contacted, the Project Manager will do so.

B. CR Program Manager's Responsibilities:

- Identify Find: The CR Program Manager (or a CR Specialist if so delegated), will ensure that a qualified professional archaeologist examines the find to determine if it is archaeological.

    - If it is determined not archaeological, work may proceed with no further delay.

    - If it is determined to be archaeological, the CR Manager or CR Specialist will continue with notification.

    - If the find may be human remains or funerary objects, the CR Manager or CR Specialist will ensure that a qualified physical anthropologist examines the find. If it is determined to be human remains, the procedure described in Section 5 will be followed.

- Notify SHPO: The CR Program Manager (or a CR Specialist if so delegated) will contact the involved federal agencies (if any) and the State Historical Preservation Office (SHPO).

- Notify Tribes: If the discovery may relate to Native American interests, the Manager or Specialist will also contact the project's Tribal Liaison, or, if the project is not assigned a Liaison, the Executive Tribal Liaison.

Federal Agencies:

United States Air Force:
Name
Title
Number
Email

Nevada Historical Presevation Office:

Rebecca Lynn Palmer
State Historic Preservation Officer
775-684-3443
rlpalmer@shpo.nv.gov

or

Annie Hershey
Archaeologist
775-684-3441
ahershey@shpo.nv.gov

Tribal Liaisons:

Project Tribal Liaison
Kish Lapierre
(702) 652-5813
kish.lapierre@us.af.mil

Executive Tribal Liaison
Name
Number
Email

The Tribal Liaison, or CR Program Manager or Specialist, will contact the interested and affected Tribes.

Tribes consulted on this project are:

Tribe:
Las Vegas Paiute Tribe
(702) 386-3926
contact@lvpaiute.com

Tribe:
Name
Title
Number
Email

Tribe:
Name
Title
Number
Email

Tribe:
Name
Title
Number
Email

Tribe:
Name
Title
Number
Email

Tribe:
Name
Title
Number

Tribe:
Name
Title
Number

Email Email

C. Further Activities

- Archaeological discoveries will be documented as described in Section 6.
- Construction in the discovery area may resume as described in Section 7.

5. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect.

If the project occurs on federal lands (e.g., national forest or park, military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 apply, and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, USAF will comply with applicable state and federal laws, and the following procedure:

A. Notify Law Enforcement Agency or Coroner's Office:

In addition to the actions described in Sections 3 and 4, the Project Manager will immediately notify the local law enforcement agency or coroner's office.

The coroner (with assistance of law enforcement personnel) will determine if the remains are human, whether the discovery site constitutes a crime scene, and will notify the Nevada SHPO if necessary.

Clark County Coroner-Medical Examiner
(702) 455-3210

City of North Las Vegas Police Department
(702) 633-9111

B. Participate in Consultation:

Per NRS 383.011, NRS 383.160, NRS 383.170, and NRS 383.180, Nevada SHPO will have jurisdiction over non-forensic human remains. USAF personnel will participate in consultation.

C. Further Activities:

- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in NRS 383.170.3.

- When consultation and documentation activities are complete, construction in the discovery area may resume as described in Section 7.

6. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological deposits discovered during construction will be assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

Cultural Resources Program staff will ensure the proper documentation and assessment of any discovered cultural resources in cooperation with the federal agencies (if any), SHPO, affected tribes, and a contracted consultant (if any).

All prehistoric and historic cultural material discovered during project construction will be recorded by a professional archaeologist on State of Nevada cultural resource site or isolate form using standard techniques. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Discovery locations will be documented on scaled site plans and site location maps.

Cultural features, horizons and artifacts detected in buried sediments may require further evaluation using hand-dug test units. Units may be dug in controlled fashion to expose features, collect samples from undisturbed contexts, or interpret complex stratigraphy. A test excavation unit or small trench might also be used to determine if an intact occupation surface is present. Test units will be used only when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. Excavations will be conducted using state-of-the-art techniques for controlling provenience.

Spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock will be recorded for each probe on a standard form. Test excavation units will be recorded on unit-level forms, which include plan maps for each excavated level, and material type, number, and vertical provenience (depth below surface and stratum association where applicable) for all artifacts recovered from the level. A stratigraphic profile will be drawn for at least one wall of each test excavation unit.

Sediments excavated for purposes of cultural resources investigation will be screened through 1/8-inch mesh, unless soil conditions warrant ¼-inch mesh.

All prehistoric and historic artifacts collected from the surface and from probes and excavation units will be analyzed, catalogued, and temporarily curated. Ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), SHPO, and the affected tribes.

Within 90 days of concluding fieldwork, a technical report describing any and all monitoring and resultant archaeological excavations will be provided to the Project Manager, who will

forward the report to the USAF Cultural Resources Program for review and delivery to the federal agencies (if any), SHPO, and the affected tribe(s).

If assessment activity exposes human remains (burials, isolated teeth, or bones), the process described in Section 5 above will be followed.

7. PROCEEDING WITH CONSTRUCTION

Project construction outside the discovery location may continue while documentation and assessment of the cultural resources proceed. A USAF CR Specialist must determine the boundaries of the discovery location. In consultation with SHPO and affected tribes, Project Manager and Cultural Resources Program staff will determine the appropriate level of documentation and treatment of the resource. If federal agencies are involved, the agencies will make the final determinations about treatment and documentation.

Construction may continue at the discovery location only after the process outlined in this plan is followed and USAF (and other federal agencies, if any) determine that compliance with state and federal laws is complete.

Appendix H

Biological Evaluation

BIOLOGICAL EVALUATION

FOR THE

Nellis Air Force Base Reclaimed Water Pipeline

Prepared by:

Environmental Planning Group, LLC

on behalf of:

March 2017

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1. INTRODUCTION

The following Biological Evaluation (BE) was prepared and is submitted in support of the Nellis Air Force Base Reclaimed Water Pipeline (the Project) to support analysis of the potential environmental impacts of the Project in an Environmental Assessment, as required by the National Environmental Policy Act (NEPA). The United States Air Force (USAF) is the lead federal agency for the Project for the NEPA analysis.

The BE also provides a determination whether the development or operation of the Project will have any effects on species that are listed as threatened, endangered, or proposed for listing as threatened or endangered under the Endangered Species Act (ESA) of 1973 (50 CFR Part 402). Section 7 of the ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that their actions do not jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitat. Federal actions include providing funds for a project or issuing various types of approvals (e.g., permits or easements).

2. PROJECT DESCRIPTION

2.1. PROJECT BACKGROUND

The Project is located entirely within Clark County, Nevada, in the City of North Las Vegas (Figure 1). The City of North Las Vegas (CNLV) proposes to install a reclaimed water line within an existing utility corridor that includes an electrical transmission line, between the Nellis Air Force Base (NAFB) golf course, known as Sunrise Vista Golf Course (SVGC), and the CNLV Water Reclamation Facility (WRF). The primary element of the reclaimed water line is the reduction in the use of potable water for irrigation purposes on the SVGC.

In order to construct the reclaimed water line, excavation and backfilling of earth between the CNLV-WRF and SVGC will be required. This excavation will be in the form of a trench, approximately two feet wide, five feet deep, and 12,100 feet long. Based on these dimensions, between 4,400 and 5,000 cubic yards of earth will be removed, depending on which route is selected. The trench will be built from CNLV-WRF to SVGC, with a branch to each pond. After construction and installation of the pipeline, the trench will be backfilled with excavated material and the disturbed vegetation returned to its existing condition or better.

The construction of this pipeline will most likely utilize various motorized construction equipment such as water trucks, dump trucks, excavators, cement and mortar mixers, tractors, backhoes, front-end loaders, forklifts, and generator sets. This equipment will be used to excavate the trench for the pipeline alignment, install the pipe and conduit, backfill the trench, and repair or replace concrete or asphalt cart paths and roadways.

Construction of the pipeline shall be timed to avoid the migratory bird breeding and nesting season (September 1 to February 28), or as much of the season as feasible. Should Project planning and scheduling cause all or any portion of the Project to be constructed during the migratory bird breeding and nesting season, then Project activities will be subject to potential exclusionary buffer(s) when and where active nests, including occupied Burrowing Owl burrows, are discovered during the course of construction. The construction period should last approximately 6 to 9 months.

Figure 1. Nellis Reclaimed Water Line Project Area and Alternatives.

3. AFFECTED ENVIRONMENT

The Project site is located entirely on the Nellis Air Force Base in Clark County, Nevada. The Project crosses lands managed by the USAF.

3.1. PHYSICAL ENVIRONMENT

The Western Regional Climate Center (WRCC) provides summary climate data throughout the West. At the North Las Vegas Airport Station near the Project area, data are summarized between the years 2000 and 2008 (WRCC 2017). The average annual precipitation is approximately 3.82 inches. The average maximum temperature is approximately 80.3 degrees Fahrenheit, and the average annual minimum temperature is 57.6 degrees Fahrenheit.

3.2. BIOLOGICAL ENVIRONMENT

Historically, the Project area was located in Mojave Desertscrub (Brown and Lowe 1980, Brown 1982). However, the Project area is located entirely in a developed or previously disturbed urban and industrial environment. The Project crosses an abandoned golf course, runs adjacent to spillways, and then crosses an active golf course.

Figure 2. Representative habitat in Project area.

Figure 3. Representative habitat in Project area.

Figure 4. Representative habitat in Project area.

Figure 5. Representative habitat in Project area.

Figure 6. Representative habitat in Project area.

4. METHODS

Species in the Project vicinity listed as endangered or threatened under the ESA were identified using the USFWS Information, Planning, and Conservation System (IPaC) website (http://ecos.fws.gov/ipac/). The potential for occurrence in the Project area of the species addressed in this BE was based on existing information on the species distribution, and qualitative comparisons of the habitat requirements of each species to vegetation communities or landscape features of the project area.

At the request of Greeley and Hansen (Project engineers), Environmental Planning Group, LLC biologist Tyffany Nidey conducted a pedestrian biological reconnaissance survey of the Project area on March 21, 2017. No species-specific, protocol-level surveys were identified as necessary, as no potential habitat for ESA-listed species was found during the preliminary evaluation of the Project area and IPaC query results.

In addition to species listed as endangered or threatened under the ESA, Birds of Conservation Concern (BCC) protected under the Migratory Bird and Treaty Act (MBTA) and species protected by the state of Nevada were evaluated for potential occurrence. The Department of Defense has entered into a Memorandum of Understanding with the USFWS to conserve migratory birds and their habitat, including considering BCC and other sensitive species in decisions that may affect migratory birds. Table 2Table 1 lists all species evaluated, provides background information on each species, and notes whether a species may occur in the Project area. Table 2 also includes the Gila Monster, which is protected in Nevada but is not ESA-listed or state-listed as threatened or endangered. Table 2 lists species identified in the IPaC query, and provides determinations for whether the proposed Project would affect these species.

Table 1. Special-status Species That Were Evaluated for Potential Occurrence within the Project Area				
BCC: USFWS Bird of Conservation Concern **BGEPA:** Bald and Golden Eagle Protection Act **E:** ESA Endangered Species			**NNHP:** Nevada Natural Heritage Project **T:** ESA Threatened Species	
Common Name ***Latin Name***	**Status**	**Critical Habitat**	**Habitat and Notes**	**Potential Presence in or near the Project Area**
Birds				
American Bittern *Botaurus lentiginosus*	BCC	NA	Marshes or meadows with dense vegetation.	No suitable habitat present in Project area.
Western Grebe *Aechmophorus occidentalis*	BCC	NA	Winters on lakes, bays, and in the ocean.	No suitable habitat present in Project area.
Long-billed Curlew *Numenius americanus*	BCC	NA	Marshes, urban lawns, and beaches.	Yes
Bald Eagle *Haliaeetus leucocephalus*	BCC; BGEPA	NA	Common in winter along water courses and reservoirs. Nest sites are often clumps of mature, deciduous trees in riparian areas.	No suitable habitat present in Project area.
Golden Eagle *Aquila chrysaetos*	BCC; BGEPA	NA	Mountain cliffs and canyons. Hunts in open habitats, but avoids human activity.	No suitable habitat present in Project area.
Ferruginous Hawk *Buteo regalis*	BCC	NA	Arid grasslands and agriculture fields.	Yes
Swainson's Hawk *Buteo swainsoni*	BCC	NA	Prairies, grasslands, and agriculture fields.	Yes
American Peregrine Falcon *Falco peregrinus anatum*	BCC	NA	Mountain and canyon habitats.	Yes
Prairie Falcon *Falco mexicanus*	BCC	NA	Desertscrub, semidesert grassland, and agriculture fields. Nests on cliff ledges.	Yes
Snowy Plover *Charadrius nivosus*	BCC	NA	Unvegetated coastal beaches and inland alkaline lakes.	No suitable habitat present in Project area.
Long-billed Curlew *Numenius americanus*	BCC	NA	Marshes and short-grass prairies.	Yes
Lesser Yellowlegs *Tringa flavipes*	BCC	NA	Shallow ponds and wetlands with emergent vegetation.	Yes
Yellow-billed Cuckoo *Coccyzus americanus*	T	Proposed, outside Project area	Mature riparian woodlands.	No suitable habitat present in Project area.
Western Burrowing Owl *Athene cunicularia hypugaea*	BCC	NA	Dry, open, sparsely vegetated habitats.	Yes

Table 1. Special-status Species That Were Evaluated for Potential Occurrence within the Project Area				
BCC: USFWS Bird of Conservation Concern **BGEPA:** Bald and Golden Eagle Protection Act **E:** ESA Endangered Species			**NNHP:** Nevada Natural Heritage Project **T:** ESA Threatened Species	
Common Name ***Latin Name***	**Status**	**Critical Habitat**	**Habitat and Notes**	**Potential Presence in or near the Project Area**
Flammulated Owl *Psiloscops flammeolus*	BCC	NA	Mixed oak and coniferous forests, primarily ponderosa pine.	No suitable habitat present in Project area.
Costa's Hummingbird *Calypte costae*	BCC	NA	Ephemeral washes in desertscrub communities, chaparral, and meadows.	Yes
Calliope Hummingbird *Selasphorus calliope*	BCC	NA	Riparian thickets and montane meadows in coniferous forests.	No suitable habitat present in Project area.
Rufous Hummingbird *Selasphorus rufus*	BCC	NA	Open coniferous forests and riparian woodlands. Migrants occupy a variety of habitats.	Yes
Gilded Flicker *Colaptes chrysoides*	BCC	NA	Sonoran desertscrub communities and riparian woodlands with plants large enough for nest sites.	No suitable habitat present in Project area.
Southwestern Willow Flycatcher *Empidonax traillii extimus*	E	Yes, outside Project area	Dense riparian habitat of willow, salt cedar, and box elder.	No suitable habitat present in Project area.
Loggerhead Shrike *Lanius ludovicianus*	BCC	NA	Prairies, desertscrub communities, and ecotones.	Yes
Gray Vireo *Vireo vicinior*	BCC	NA	Piñon-juniper woodlands, oak-juniper woodlands, and mesquite bosques.	No suitable habitat present in Project area.
Bell's Vireo *Vireo bellii*	BCC	NA	Densely vegetated understories in riparian areas, mesquite brushlands, or young forests.	No suitable habitat present in Project area.
Cactus Wren *Campylorhynchus brunneicapillus*	BCC	NA	Desertscrub communities. May utilize urban environments.	Yes
Bendire's Thrasher *Toxostoma bendirei*	BCC	NA	Desertscrub and semidesert grasslands.	Yes
Le Conte's Thrasher *Toxostoma lecontei*	BCC	NA	Sparsely vegetated desertscrub communities. Developed lands are not compatible with the species' needs.	No suitable habitat present in Project area.
Sage Thrasher *Oreoscoptes montanus*	BCC	NA	Winters in grasslands with scattered shrubs, desertscrub, and piñon-juniper woodlands.	Yes
Phainopepla *Phainopepla nittens*	BCC	NA	Desertscrub, oak woodlands, and open coniferous forests, where mistletoe is common.	Yes
Virginia's Warbler *Oreothlypis virginiae*	BCC	NA	Open woodlands with a dense, brushy understory.	No suitable habitat present in the Project area.

Table 1. Special-status Species That Were Evaluated for Potential Occurrence within the Project Area				
BCC: USFWS Bird of Conservation Concern **BGEPA:** Bald and Golden Eagle Protection Act **E:** ESA Endangered Species			**NNHP:** Nevada Natural Heritage Project **T:** ESA Threatened Species	
Common Name ***Latin Name***	**Status**	**Critical Habitat**	**Habitat and Notes**	**Potential Presence in or near the Project Area**
Lucy's Warbler *Vermivora luciae*	BCC	NA	Densely vegetated riparian woodlands and mesquite bosques.	No suitable habitat present in the Project area.
Yellow Warbler *Setophaga petechia*	BCC	NA	Densely vegetated riparian thickets. Variety of habitats near water during migration.	Yes
Green-tailed Towhee *Pipilo chlorurus*	BCC	NA	Shrub-steppe communities and dense patches of mesquite in xeroriparian washes.	No suitable habitat present in the Project area.
Brewer's Sparrow *Spizella breweri*	BCC	NA	Shrub-steppe habitats.	Yes
Black-chinned Sparrow *Spizella atrogularis*	BCC	NA	Chaparral communities.	No suitable habitat present in the Project area.
Reptiles				
Desert Tortoise *Gopherus agassizii*	T	Yes, outside Project area	Sandy flats to rocky foothills in desertscrub where suitable soils for den construction exist.	No suitable habitat present in the Project area.
Gila Monster *Heloderma suspectum*	None	NA	Rocky slopes and canyons in desertscrub communities.	No suitable habitat present in the Project area.
Fish				
Pahrump Poolfish *Empetrichthys latos*	E	No	Springs with mild temperatures.	Project area outside of known species distribution.

Table 2. ESA-Listed Species Evaluated for Potential Occurrence within the Project Action Area					
E: ESA Endangered Species. **T:** ESA Threatened Species.					
Common Name ***Scientific Name***	**Status**	**Critical Habitat**	**Habitat and Notes**	**Effects Determination**	
				Species	**Critical Habitat**
Birds					
Southwestern Willow Flycatcher *Empidonax traillii extimus*	E	Designated, outside Project area	Dense riparian thickets. No suitable nesting or migration habitat in Project area.	No effect	No effect
Yellow-billed Cuckoo *Coccyzus americanus*	T	Proposed, outside Project area	Mature riparian woodlands. No suitable nesting or migration habitat in Project area.	No effect	No effect
Reptiles					
Desert Tortoise *Gopherus agassizii*	T	Designated, outside Project area	Sandy flats to rocky foothills in desertscrub where suitable soils for den construction exist.	No effect	No effect
Fish					
Pahrump Poolfish *Empetrichthys latos*	E	None	Springs with mild temperatures.	No effect	NA

5. SPECIAL-STATUS SPECIES

5.1. WESTERN BURROWING OWL (ATHENE CUNICULARIA HYPUGAEA)

The Western Burrowing Owl is a BCC and is protected under the MBTA. Burrowing Owls prefer open habitat with low vegetation and soft soils, particularly where burrowing rodents are present to create burrows that may be modified and used by Burrowing Owls. Burrowing Owls have adapted to use agricultural field margins, vacant lots, open space near airports, and other similar human-modified but relatively undisturbed areas, and frequently occur in those areas in the Southwest.

Burrowing Owls are present in the Project area, as reported by Nevada Natural Heritage Project (NNHP) and documented during the field survey (Figure 1, Figure 7). Occupied and unoccupied burrows were documented during the field survey. NAFB has constructed Burrowing Owl burrows along parts of the Project area as mitigation to offset past impacts to the species (Figure 8). In anticipation of the potential construction of the Project, entrances of some of these burrows have been blocked to prevent occupancy during the current nesting season.

Figure 7. Occupied Burrowing Owl burrow in Project area.

Figure 8. Constructed Burrowing Owl burrows in Project area.

5.2. MIGRATORY BIRDS

The remaining BCCs may enter the Project area at any time. The species may use the habitat surrounding the Project area, and could sporadically occur during migration or dispersal. However, the Western Burrowing Owl is the only species that prefers and is associated with habitat similar to that in the Project area. No other BCCs were observed by the biologist during the general reconnaissance survey.

5.3. GILA MONSTER (HELODERMA SUSPECTUM)

The NNHP query identified historical records of Gila Monsters near the Project area, and the species is present in undisturbed Mojave Desertscrub around the Las Vegas region. However, no suitable habitat for Gila Monsters is present in the Project area, and the species does not typically occur in urban, developed areas.

6. CONCLUSIONS

The proposed Project and alternatives would have no effect on any ESA-listed species, as no habitat for these species is present in the Project area. Burrowing Owl burrows may be affected during construction of the Project. However, the Project description includes measures to avoid harm to Burrowing Owls and any other migratory birds.

7. REFERENCES

Brown, D. E. 1982. Biotic Communities of the American Southwest – United States and Mexico. Desert Plants 4 (1-4) 342 pp.

Brown, D.E., and C.H. Lowe. 1980. Biotic Communities of the Southwest. Map. University of Utah Press (1994 printing).

Western Regional Climate Center (WRCC). 2017. Desert Research Institute, Reno, Nevada. North Las Vegas Airport, Nevada. Retrieved at: www.wrcc.dri.edu/summary/vgt.nv.html

Appendix A. U.S. Fish and Wildlife Information, Planning, and Conservation System Report

IPaC **U.S. Fish & Wildlife Service**

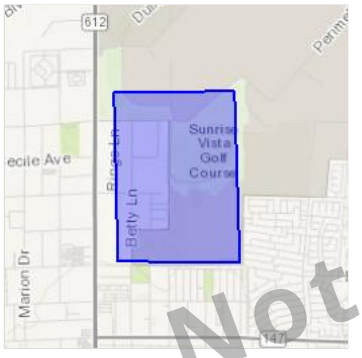
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Clark County, Nevada



Local office

Southern Nevada Fish And Wildlife Office

(702) 515-5230
(702) 515-5231

4701 N. Torrey Pines Drive
Las Vegas, NV 89130-2301

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Endangered Species Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Southwestern Willow Flycatcher Empidonax traillii extimus There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo Coccyzus americanus There is a **proposed** critical habitat for this species. Your location is outside the proposed critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Pahrump Poolfish Empetrichthys latos No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7281	Endangered

Reptiles

NAME	STATUS
Desert Tortoise Gopherus agassizii There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. https://ecos.fws.gov/ecp/species/4481	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The migratory birds species listed below are species of particular conservation concern (e.g. Birds of Conservation Concern) that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the AKN Histogram Tools and Other Bird Data Resources. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

NAME	SEASON(S)
Bald Eagle *Haliaeetus leucocephalus* https://ecos.fws.gov/ecp/species/1626	Wintering
Bell's Vireo *Vireo bellii* https://ecos.fws.gov/ecp/species/9507	Breeding
Bendire's Thrasher *Toxostoma bendirei* https://ecos.fws.gov/ecp/species/9435	Breeding
Black-chinned Sparrow *Spizella atrogularis* https://ecos.fws.gov/ecp/species/9447	Breeding
Brewer's Sparrow *Spizella breweri* https://ecos.fws.gov/ecp/species/9291	Breeding
Burrowing Owl *Athene cunicularia* https://ecos.fws.gov/ecp/species/9737	Year-round
Cactus Wren *Campylorhynchus brunneicapillus* https://ecos.fws.gov/ecp/species/8834	Year-round
Costa's Hummingbird *Calypte costae* https://ecos.fws.gov/ecp/species/9470	Breeding
Flammulated Owl *Otus flammeolus* https://ecos.fws.gov/ecp/species/7728	Breeding
Gray Vireo *Vireo vicinior* https://ecos.fws.gov/ecp/species/8680	Breeding
Green-tailed Towhee *Pipilo chlorurus* https://ecos.fws.gov/ecp/species/9444	Wintering
Le Conte's Thrasher *toxostoma lecontei* https://ecos.fws.gov/ecp/species/8969	Year-round
Loggerhead Shrike *Lanius ludovicianus* https://ecos.fws.gov/ecp/species/8833	Year-round
Long-billed Curlew *Numenius americanus* https://ecos.fws.gov/ecp/species/5511	Breeding
Lucy's Warbler *Vermivora luciae* https://ecos.fws.gov/ecp/species/6626	Breeding
Peregrine Falcon *Falco peregrinus* https://ecos.fws.gov/ecp/species/8831	Year-round
Prairie Falcon *Falco mexicanus* https://ecos.fws.gov/ecp/species/4736	Year-round
Sage Thrasher *Oreoscoptes montanus* https://ecos.fws.gov/ecp/species/9433	Wintering

Short-eared Owl Asio flammeus https://ecos.fws.gov/ecp/species/9295	Wintering
Sonoran Yellow Warbler Dendroica petechia ssp. sonorana https://ecos.fws.gov/ecp/species/2893	Migrating
Swainson's Hawk Buteo swainsoni https://ecos.fws.gov/ecp/species/1098	Breeding
Western Grebe aechmophorus occidentalis https://ecos.fws.gov/ecp/species/6743	Breeding

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAANCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the Northeast Ocean Data Portal. The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAANCCOS models: the models were developed as part of the NOAANCCOS project: Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf. The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the Northeast Ocean Data Portal, which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The Avian Knowledge Network (AKN) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest,survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the Migratory Bird Programs AKN Histogram Tools webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North, Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Atlantic Seabirds:

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAANCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Facilities

Wildlife refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix I

Cultural Resources Evaluation

A CLASS I CULTURAL RESOURCES RECORDS CHECK FOR THE NELLIS RECLAIMED WATER PIPELINE, CLARK COUNTY, NEVADA

Prepared for:

Greeley and Hansen
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Las Vegas, Nevada 89144

For submittal to:

United States Department of the Air Force

Prepared by:

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EPG Cultural Resource Services Technical Paper No. 2017-10

April 2017

Restrict Distribution
To prevent vandalism, restrict information in this report about the location of archaeological sites.

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ABSTRACT

Project Title: Nellis Reclaimed Waterline

Report Title: A Class I Cultural Resources Records Check for the Nellis Reclaimed Water Pipeline, Clark County, Nevada

Report Date: April 2017

Agencies: United States Air Force (Nellis Air Force Base), Nevada State Historic Preservation Office, City of North Las Vegas (CNLV)

Project Number: Greeley & Hansen 0001

Project Description: The CNLV proposes to install a reclaimed water line within an existing utility corridor that connects the Nellis Air Force Base golf course and the CNLV Water Reclamation Facility. The primary element of the reclaimed water line is the reduction in the use of potable water for irrigation purposes on the golf course. This reduction of the withdrawal of aquifers in the Las Vegas Valley would be in accordance with the goal of the United States Air Force to conserve environmental resources where possible. The CNLV asked Greeley and Hansen Environmental Engineers to consult on pipeline design and construction. Greeley and Hansen requested that Environmental Planning Group, LLC (EPG) conduct a Class I cultural resources records check to comply with the National Environmental Policy Act of 1969; Environmental Impact Analysis Process for the United States Air Force (32 Code of Federal Regulations [CFR] 989); and other applicable federal and state environmental legislation. The Class I study area consists of the proposed project area with a one-mile buffer.

Location and Jurisdiction: The proposed project area is located on privately owned land in the CNLV, within Sections 9 and 16, Township 20 South, Range 62 East of the Mt. Diablo Baseline and Meridian, as depicted on the Las Vegas NE, Nevada, 7.5-minute U.S. Geological Survey topographic quadrangle.

Personnel and Dates of Fieldwork: A Class I records review was conducted on March 30, 2017, by EPG archaeologist Cara Lonardo. Dr. Steve Swanson served as senior reviewer and project director.

Archaeological Sites in Project Area: None

Recommendations: Fourteen prior cultural resource studies and twenty previously recorded sites were identified within the Class I study area. The project area was previously surveyed for cultural resources but no sites were recorded within the proposed footprint of the project. Given the previous disturbance in the proposed project area, no historic properties are expected to be present on the surface. Because the project involves the installation of a reclaimed water line within an existing utility corridor that already contains an electrical transmission line, subsurface cultural remains are not expected to be encountered. EPG recommends that no further cultural resources work is necessary for this project.

If any human remains or funerary objects are discovered during construction on state or private land, they should be reported to the Office of Historic Preservation in accordance with Nevada Revised Statute 383.170.

INTRODUCTION

The City of North Las Vegas (CNLV) proposes to install a reclaimed water line within an existing utility corridor that connects the Nellis Air Force Base golf course and the CNLV Water Reclamation Facility. The primary element of the reclaimed water line is the reduction in the use of potable water for irrigation purposes on the golf course. This reduction of the withdrawal of aquifers in the Las Vegas Valley would be in accordance with the goal of the United States Air Force to conserve environmental resources where possible. The CNLV asked Greeley and Hansen Environmental Engineers to consult on pipeline design and construction. Greeley and Hansen requested that Environmental Planning Group, LLC (EPG) conduct a Class I cultural resources records check to comply with the National Environmental Policy Act of 1969; Environmental Impact Analysis Process for the United States Air Force (32 Code of Federal Regulations [CFR] 989); and other applicable federal and state environmental legislation. The Class I study area consists of the proposed project area with a one-mile buffer.

Project Location

The proposed project area is located on privately owned land in the CNLV, within Sections 9 and 16, Township 20 South, Range 62 East of the Mt. Diablo Baseline and Meridian, as depicted on the Las Vegas NE, Nevada, 7.5-minute U.S. Geological Survey topographic quadrangle (Figure 1).

ENVIRONMENTAL SETTING

The project area is located in the greater Basin and Range physiographic province. This province is characterized by north-south trending mountain ranges separated by deep, wide valleys. Elevations range between 1,800 to 1,840 feet above mean sea level. The project area is in the Mohave Desertscrub biotic community, which is characterized by Joshua tree, creosotebush, all-scale, brittlebush, desert holly, and white burrobush, and dominated by shadscale and blackbrush (Brown 1994).

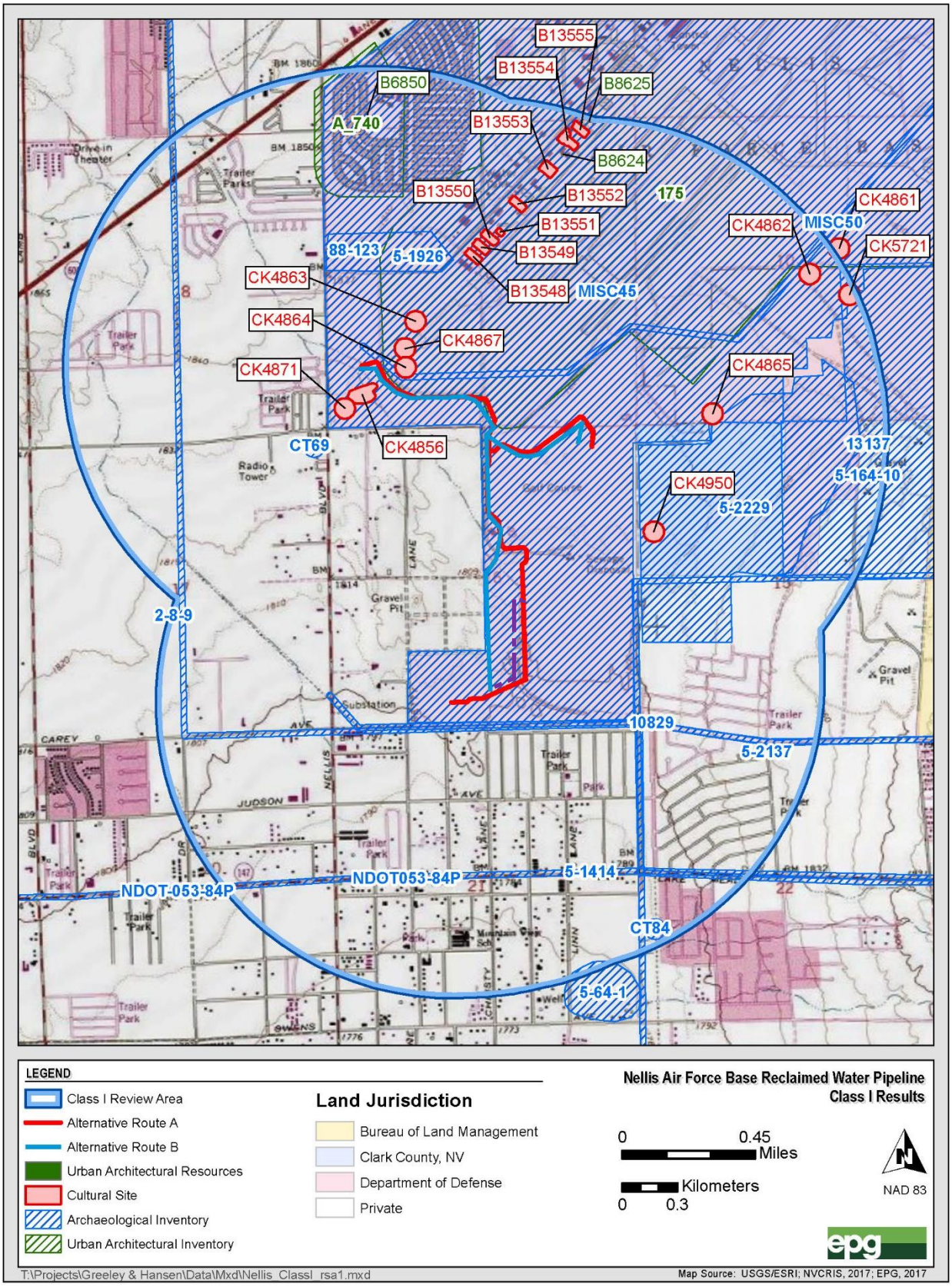

Figure 1. Project location and previous research.

CULTURE HISTORY

Mojave Desert Chronology

This chronology is provided for the southern portion of Nevada where the Great Basin transitions to the Mojave Desert. The Mojave Desert Chronology contains five major periods: Lake Mojave (10,000 BC to 5000 BC); Pinto (5000 BC to 2000 BC); Gypsum (2000 BC to AD 500); Saratoga Springs (AD 500 to AD 1200); and Ethnohistoric (AD 1200 to AD 1600) (Warren and Crabtree 1986). Each of these will be discussed briefly below.

Lake Mojave Period (10,000 BC to 5000 BC)

The Stemmed Point Tradition was first identified in the 1930s by researchers working around the shores of the extinct Lake Mojave in southern California (Grayson 1993). The Stemmed Point Tradition has been firmly dated from 9200 BC to 5500 BC. Projectile point styles commonly associated with the Stemmed Point Tradition are the Lake Mojave and Silver Lake types. Stemmed Point Tradition artifact assemblages also include distinctive lithic crescentics of unknown function (Ahlstrom and Roberts 2001). The tool tradition for this period was first defined at the C.W. Harris Site in southern California, and includes items such as Lake Mojave and Silver Lake points, scrapers, burins, small bifacially flaked knives, crescents, and other bifacially flaked tools (Campbell et al. 1937; Rogers 1939).

The distribution of Stemmed Point Tradition assemblages across the prehistoric landscape indicates that these people followed a nomadic lifestyle dependent on the exploitation of a wide variety of plant and animal food resources. Studies conducted on Lake Mojave sites include Davis (1967) on settlement patterns, Tuohy (1969) on Lake Mojave and Silver Lake points, and Rafferty (1986) on the Las Vegas Valley.

Pinto Period (5000 BC to 2000 BC)

A distinctive type of smaller projectile, known as a Pinto point, characterizes the Pinto Period. Other distinctive artifacts include large and small leaf-shaped points and knives and a variety of scrapers, drills, and engravers. Groundstone artifacts also are present and include flat milling stones and shallow basin stones. A mobile hunting-and-gathering lifestyle still heavily influenced this period, but the settlement focus begins to shift away from pluvial lakes to rivers and streams (Blair et al. 1999 citing Campbell et al. 1937). Site use during this time was more specialized, as evidenced by some spring sites representing remains of specialized hunting locales (Blair et al. 1999).

Seymour (1997) notes that during the Pinto Period, the massive environmental degradation sequence associated with the late Pleistocene/Holocene transition is most evident. During the Late Pinto Period, the deserts are at their most arid and appear to have been essentially abandoned (Warren and Crabtree 1986). Not surprisingly, sites dating to this period in southern Nevada are few.

Gypsum Period (2000 BC to AD 500)

The transition from the Pinto to Gypsum Period is associated with a shift from xeric to mesic environmental conditions (Seymour 1997). The transition into moister environmental conditions is associated with the introduction of Gypsum-series projectile points, and a specialized toolkit reflecting increased reliance on plant-food processing (Ahlstrom and Roberts 2001). The characteristic artifact assemblage for this period includes medium-sized to large-stemmed and notched points known as Elko Eared, Elko Corner-notched, Gypsum Cave, and Humboldt Concave Base points (Warren and Crabtree 1986). Gypsum Cave is the type-site for this period. A hearth, numerous dart-shaft fragments, and Gypsum-series projectile points were recovered from the lower levels in Gypsum Cave (Hauck et al. 1979). Radiocarbon dating from wood recovered in association with these projectiles returned dates of 2100+/-300 BC and 1920+/-250 BC (Ezzo and Majewski 1995).

The projectile point typologies of the Gypsum Period are stylistically similar to projectile points identified in the Western Great Basin, suggesting a relationship with people in the Western Great Basin. In contrast, others have interpreted the Gypsum Period materials with a southwestern influence citing the presence of pit houses, Basketmaker III pottery, and spilt-twig figurines (Warren and Crabtree 1986).

The Gypsum Period is better represented in the archaeological record than any of the preceding periods. Hunting continued to be an important component of the subsistence strategy; however, milling stones and hand stones became more common during this period. Seymour (1997) notes that the subsistence intensification was likely associated with population increase and a greater competition for available resources.

Saratoga Springs Period (AD 500 to AD 1200)

This period addresses the Basketmaker III to Pueblo transition. Within the project area, this includes the Virgin Anasazi who were located along the Muddy River and the Patayan near the deserts of around present day Las Vegas.

Virgin Anasazi (AD 500 to AD 1150)

The Virgin Anasazi is the western branch of the Anasazi that occupied a portion of southern Nevada. Distinguishing characteristics of the Virgin Anasazi include black-on-white ceramics, pit houses, and later pueblos; agriculture production of cotton, maize, beans, and squash; and the extraction of salt and turquoise from locally available sources. Although not exclusively limited to the Virgin and Muddy rivers, most their settlements are located along those rivers (Lyneis 1982). Early settlements consisted of small villages of pit houses occupied by extended families or kin-related groups subsisting on a mixed hunting and foraging strategy and supplemented with small amounts of cultigens (Rafferty 1984). Studies conducted at settlements dating from AD 850 to AD 1150 have observed two settlement clusters, one on the first terrace above the Muddy River within the Lower Moapa Valley and the other on the high terraces overlooking Big and Little bends of the Virgin River (Larson 1996). Also during this period, there was an increase in population as larger, more aggregated pueblos became constructed and agricultural production

was intensified (Larson 1996). Additionally, there is evidence of regional relations based on the trade of turquoise (Rafferty 1984) and shell beads from coastal California (Lyneis 1982).

Patayan (AD 800 to AD 1800)

Diagnostic traits for the Patayan include desert side-notched projectile points and recurved rim and stucco finished pottery (Waters 1982). The material culture and subsistence strategies include rock outlined jacales, boulder or rock alignments, rock-filled roasting pits, low-walled rock or boulder structures, rockshelters, milling stones, and crude pottery (Schroeder 1975, 1979). On the other hand, Rogers (1945) separated those people living along the Colorado River and named them the Yuman. Given that most of the artifact assemblages identified were surface scatters, the development of a chronology for the ceramics was challenging. The chronology developed by Rogers is predominantly used today with some modifications. Patayan I dates from AD 850 to AD 1050, Patayan II dates from AD 1050 to AD 1500, and Patayan III dates from AD 1500+ (McGuire and Schiffer 1982). The Patayan within the Las Vegas Valley were semi-sedentary and focused on two or three seasonal resources, supplemented with limited cultigens (Seymour 1997). Although the Patayan probably had their beginnings in the late Archaic Period, they had a presence in southern Nevada during the Saratoga Springs and Historic periods.

Southern Paiute

The Southern Paiute occupied southern Nevada at the time of Euroamerican contact. The Southern Paiute practiced a hunting and gathering strategy and were seasonally mobile, moving from one resource to another and occupying a myriad of ecological zones. Artifacts associated with the Paiute were simple and oriented toward resource procurement. These items include rabbit nets, wood bows, wooden crooks, stone knives, flake tools, woven bags and baskets, fire drills, milling stones, and bone tools (Rafferty and Blair 1986). Paiute ceramics were crude, brown earthenware (Tizon Brown variety) designed for cooking and storage. Paiute site types ranged from open camps adjacent to springs or seeps, rock circles, rock shelters, brush shelters, roasting pits, hunting blinds, and a variety of other site types (Rafferty 1995). The Paiutes also practiced limited corn, bean, and squash horticulture. There is ample evidence of the Southern Paiute in the Las Vegas area. Rock shelters such as Bird Springs, Mule Springs, RJK Site, and Lennie's Site all contain a Paiute component (Rafferty 1995). Fowler and Fowler (1981) also reference over 20 Southern Paiute sites southwest of the project area.

Chemehuevi

The Chemehuevi were closely related to the Southern Paiute (Kelly and Fowler 1986) and belong to the Numic branch of the Uto-Aztecan language family (Miller 1986). It is suggested that the Numic speaking groups expanded into the Las Vegas and surrounding areas from an origination area in southeastern California during the last 1,000 years (Madsen and Rhode 1994). Territory of the Chemehuevi ranged south and west of the Las Vegas Band of Paiute, inland from the Colorado River until approximately Needles, then east toward the river. Although there are some changes in their location, they have occupied portions of the western Mojave Desert for the last 200 years (Whitley and Nabokov 2000). Similar to other Native American groups in the area, the Chemehuevi practiced a hunting and gathering subsistence, supplemented with horticulture (Euler and Fowler 1973). Artifacts associated with the Chemehuevi include paddle

and anvil constructed ceramics that were sometimes decorated (Kelly and Fowler 1986). Hunting gear included bows, arrows, and nets.

Historic Period (AD 1600 to AD 1950)

The historic period is known for exploration, mining, transportation, and the construction of major water control features.

Historic Exploration

The Historic Period is characterized by settlement of the area by Euro-Americans. The Spanish and Mexicans made several expeditions through Nevada. In 1776 with a party of 10 men, Franciscan friars Dominguez and De Escalante left Santa Fe, New Mexico to establish a mission at Monterey, California. This marked the first exploration of the Great Basin area by non-Indians (Myhrer et al. 1990). Much of the subsequent exploration focused around the Colorado River and included Spanish, Euro-American, and military exploration groups.

Fur traders and trappers explored all the major rivers including the Colorado River in search of beavers to trap. James Ohio Pattie took several mountain men along the Colorado River during the 1820s and 1830s (Walker and Bufkin 1986). Several other famous mountain men also investigated portions of the Colorado River, including Jedediah Smith and Ewing Young. It was not until 1869 that the Colorado River was fully mapped. In 1869, Powell and his crew set out from Green River City, Wyoming Territory to survey and study the Colorado and Green rivers. The Powell party completed their journey at the junction of the Virgin and Colorado rivers after three months in 1869. Transportation

The Old Spanish Trail was a prominent travel route during the exploration and settlement of the area. The trail provided an established route from New Mexico to Los Angeles by way of northern Utah, southern Nevada, or northern Arizona (Blair et al. 1999). The trail was used by immigrants on their way to California, as a mail route from Salt Lake City to California, and by Mormon settlers to ship merchandise to Salt Lake City (Rafferty 1995). The use of this trail increased dramatically with the discovery of gold at Sutter's Fort. This trail has been extensively documented by Myhrer et al. (1990).

Water Control

Southern Nevada and western Arizona boast several large water features that were developed through the damming of sections of the Colorado River. These include the construction of the Hoover Dam and the Parker-Davis Projects.

A 1922 report submitted to Congress on the annual flooding and intermittent droughts of the lands along the Colorado River provided the idea to build the Hoover Dam. In 1931, the Bureau of Reclamation (BOR) provided the opportunity to bid on the construction of the dam. Workers came from all over the United States, and during the peak building years (1933-1935) there was an average work force of more than 5,200 men (Duke et al. 2004). Major activities associated with the construction of the Hoover Dam included the construction of Boulder City, the construction of seven miles of asphalt-surfaced highway from Boulder City to the dam site,

construction of 22.7 miles of railroad for the Union Pacific mainline from Las Vegas to Boulder City, and another ten miles of railroad from Boulder City to the dam, and construction of 222 miles of power transmission lines from San Bernardino, California to the dam site to supply energy for construction (Duke et al. 2004).

The Parker Dam Power Project and the Davis Dam Projects were consolidated in 1954 to create the Parker-Davis Project. The project includes the Davis Dam and Powerplant, Parker Dam and Powerplant, a high voltage transmission system, and substations (BOR 2007). The transmission system currently includes more than 1,500 miles of high voltage lines, 32 substations, Parker Dam, and Davis Dam (BOR 2007). Lake Havasu was formed by Parker Dam, whereas Lake Mead was created by the reservoir formed by Davis Dam. Davis Dam is 67 miles south of Hoover Dam and was created to regulate the water to be delivered to Mexico via the Mexican Treaty of 1944 (BOR 2007).

Nellis Air Force Base

The Las Vegas Army Airfield was established in late 1941 for flying and gunnery training. After World War II, it was repurposed by the United States Air Force as the Las Vegas Air Force Base and then renamed the Nellis Air Force Base in 1950. Today, Nellis conducts advanced combat training for all branches of the US Armed Forces (Manning 2005).

CLASS I RECORDS REVIEW

EPG conducted a cultural resources review within 1 mile of the proposed project area. This review consisted of a Class I inventory to identify previous cultural resource surveys, as well as previously identified cultural resource sites that may be adversely affected by the proposed project. To meet this goal, EPG primarily reviewed records accessible through the Nevada Cultural Resources Information System (NVCRIS) maintained by the Nevada State Historic Preservation Office. In addition to NVCRIS, EPG examined records from the following sources:

- Nevada State Register of Historic Places
- National Register of Historic Places (NRHP)
- General Land Office (GLO) survey plats
- Master Title Plat (MTP) records
- United States Geological Survey (USGS) Historical Topographic Maps

The Class I records review was conducted on March 30, 2017, by EPG archaeologist Cara Lonardo. Dr. Steve Swanson served as senior reviewer and project director. Prior studies and previously recorded site locations are plotted on Figure 1. The review of the NVCRIS database revealed 14 prior cultural resources studies in the 1-mile review area. A list of prior cultural resources studies is provided in Table 1. The current project area was surveyed in 1993 by Environmental Solutions, Inc. (Bergin 1993).

Table 1. Summary of Prior Cultural Resource Surveys			
Project Number	**Project Name**	**Reference**	**NVCRIS Category**
175	Historic Evaluation of Nine Buildings at Nellis Air Force Base	Geo-Marine, Inc. 2006	urban architectural inventory
5-1926/88-123	Red Flag and Hospital Parcels	Price 1988	archaeological inventory
10829	Robert B. Griffith Water Project	Seymour and Rager 2000	archaeological inventory
2-8-9	Southern Nevada Water Authority-Treatment and Transmission Facility	White and Lowe 1997	archaeological inventory
5-2137	Black Mountain Transmission Line	DuBarton and Edwards 1991	archaeological inventory
5-2229	East Range Wash Flood Control Basin	Rafferty 1993	archaeological inventory
5-164-10/13137	Nellis Air Force Withdrawal Lands	Lawrence et al. 1999	archaeological inventory
5-64-1	Briarwood Development	Green 1983	archaeological inventory
A-740	Wherry and Capehart Housing Building Inventory and Evaluation	Daly 2004	urban architectural inventory
CT69	Cingular Wireless, Facility No. LV 122-02	Duke 2001	archaeological inventory
CT84	Cingular Wireless, Facility No. LV 430-01	Duke 2002	archaeological inventory
MISC45	Main Cantonment	Bergin 1993	archaeological inventory
MISC50	Additional Survey of Area II Wastewater Service Area Sewer Line	Peter 1992	archaeological inventory
5-1414/ NDOT053-84P	Statewide Inventory, W.O. 20726	Leavitt 1985	archaeological inventory

Twenty sites have been recorded within 1 mile of the project area; these sites are listed in Table 2. No sites have been recorded in the project area footprint. No historic properties or landmarks listed on the National or State Registers of Historic Places are located within the review area. A review of MTP records, USGS Historical Topographic Map, and the historic GLO plat map for Township 20 South, Range 62 East, dated 1882, showed no features in the study area.

Table 2. Summary of Previously Recorded Cultural Resources				
Site Number	**Age**	**Description**	**NRHP Eligibility**	**NVCRIS Category**
B8624	Historic	Squadron Operations	Recommended not eligible	urban architectural resource
B6850	Historic	Wherry Housing Unit	Unevaluated	urban architectural resource
B13548	Historic	Building	Unevaluated	in process sites
B13549	Historic	Building	Unevaluated	in process sites
B13550	Historic	Building	Unevaluated	in process sites
B13551	Historic	Building	Unevaluated	in process sites

Table 2. Summary of Previously Recorded Cultural Resources				
Site Number	**Age**	**Description**	**NRHP Eligibility**	**NVCRIS Category**
B13552	Historic	Building	Unevaluated	in process sites
B13553	Historic	Building	Unevaluated	in process sites
B13554	Historic	Building	Unevaluated	in process sites
B13555	Historic	Building	Unevaluated	in process sites
CK4856	Archaic	Thermal features and lithic scatter	Recommended eligible	archaeological sites
CK4861	Prehistoric	Artifact scatter	Recommended not eligible	archaeological sites
CK4862	Prehistoric	Lithic scatter	Recommended not eligible	archaeological sites
CK4863	Prehistoric	Lithic scatter	Recommended not eligible	archaeological sites
CK4864	Prehistoric	Lithic scatter	Recommended eligible	archaeological sites
CK4865	Prehistoric	Lithic scatter	Recommended not eligible	archaeological sites
CK4867	Prehistoric	Thermal feature and lithic scatter	Recommended eligible	archaeological sites
CK4871	Historic	Trash scatter	Recommended not eligible	archaeological sites
CK4950	Prehistoric	Thermal features and groundstone	Recommended not eligible	archaeological sites
CK5721	Prehistoric	Thermal features and lithic scatter	Recommended not eligible	archaeological sites

CONCLUSIONS AND RECOMMENDATIONS

Fourteen prior cultural resource studies and twenty previously recorded sites were identified within the Class I study area. The project area was previously surveyed for cultural resources but no sites were recorded within the proposed footprint of the project. Given the previous disturbance in the proposed project area, no historic properties are expected to be present on the surface. Because the project involves the installation of a reclaimed water line within an existing utility corridor that already contains an electrical transmission line, subsurface cultural remains are not expected to be encountered. EPG recommends that no further cultural resources work is necessary for this project.

If any human remains or funerary objects are discovered during construction on state or private land, they should be reported to the Office of Historic Preservation in accordance with Nevada Revised Statute 383.170

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Appendix J

Avian Compliance Plan

Nellis Reclaimed Water Line Project

Nellis Air Force Base, NV

Avian Compliance Plan

Final – August 2017

Prepared by: Greeley and Hansen

Table of Contents

Appendix
Appendix A – Waterline Alignment and Trench Details
Appendix B – Environmental Protocols

Section 1 Introduction

1.1 Project Overview

Nellis Air Force Base (NAFB) Reclaimed Water Line project entails the construction of approximately 12,100 linear feet 10-inch diameter reclaimed water main, see Appendix A. The reclaimed water main will be connected to the existing pump station at the City of North Las Vegas – Water Reclamation Facility (WR Facility) and will supply reclaimed water to two (2) ponds – Raptor and Eagle – located on the NAFB Golf Course. The Golf Course currently pumps water from two (2) to three (3) wells – one is on site – and into the ponds. The irrigation pump stations will then pump water from the ponds. The ponds' filling is manually operated and water levels are monitored daily by visual observations.

The Raptor pond is located northwest of the golf course clubhouse and the Eagle pond is northeast of the clubhouse. The pond volumes were calculated using the known average pond depths. The Raptor pond is estimated to be 50,000 gallons and the Eagle pond is estimated to be 100,000 gallons. Based on the as-builts and site visits, both ponds are concrete lined and each pond has its own booster pump station for irrigation. Pumping equipment is located inside a small building that is adjacent to each pond. Irrigation pumps normally run continuously during the irrigation cycle, however, this is the case for the Eagle pond only as the Raptor pond has not been in operation and has been abandoned. The Eagle pond is the primary source of irrigation water for the golf course.

There is an existing reuse pump station at the WR Facility which is located adjacent to the Chlorine Contact Tank building. The reuse pump station currently houses two (2) reuse pumps that have a maximum capacity of 1,050 gallons per minute (gpm). In order to meet the required flow of 2.20 million gallons per day (mgd), both of the reuse pumps will need to be in operation. The existing 9.25-inch impeller also limits the capacity of the these reuse pumps, therefore, adding a third reuse pump and replacing the existing impellers would meet the pumping requirement of 2.20 mgd. The third reuse pump would provide redundancy to the system. When two pumps are in operation, there is no standby reclaimed water pumping capacity. If one of the pumps is out of service for any reason, one pump in operation would not meet the pumping requirement. Therefore, an additional reclaimed water reuse pump is necessary to provide the required pumping capacity.

Automatic operation of the pumps would be a practical approach for the system. A fiber optic duct bank made of PVC (size 80) will run from the WR Facility to each pond. The primary and redundant conduits will run the same length as the alignment, approximately 12,100 linear feet. The inner duct will contain three (3) 3-inch fabric and fifteen (15) electrical pullboxes will be placed throughout the alignment for the conduit to be maintained and operated properly.

A motorized gate valve will be placed at each pond and will able to communicate with the control center at the WR Facility through the fiber optic line. The reclaimed water pumping system would automatically start/stop based on the ponds' water level. At each pond, the ultrasonic/laser sensor will transmit the water level elevation and then will signal the reclaimed water pumps. Once the signal has been received, the pumps will start filling up the ponds and then stop on a preset high water levels. In addition to running a fiber optic duct bank, pond telemetry panels will be placed at each pond to allow control of the system from the NAFB golf course. The level sensing system program will also signal the emergency low pond level and a sound alarm will set off through the plant's Supervisory Control and Data Acquisition (SCADA) system.

1.2 Federal Requirements

1.2.1 National Environmental Policy Act

The reclaimed water line and related facilities are to be located on NAFB property. Therefore, the proposed project must be examined for potential effects on the environment. This examination follows the National Environmental Policy Act (NEPA) requirements for preparing a formal environmental evaluation of the action. An Environmental Assessment (EA) report is currently being prepared. The EA report will result in one of the following outcomes:

- Finding of No Significant Impact (FONSI);
- Preparation of an Environmental Impact Statement (EIS); or
- No action is taken.

If the EA results in an outcome of no significant impact, a FONSI, defined under Title 32 CFR 989.15 summarizes the findings and describes why the project does not require preparation of an EIS. For the NAFB Reclaimed Water Line Project, the EA document will be prepared in accordance with NEPA and Title 32 CFR 989 and the Air Force NEPA program (AFI 32-7061). EA preparation requires the following.

- Coordination with the Air Force Environmental Impact Analysis Process (EIAP).
- Filing of the AF Form 813, Request for Environmental Impact Analysis.
- Conduct of the EA by a State of Nevada Certified Environmental Manager (CEM).

1.2.2 Migratory Bird Treaty Act

Mitigation strategies will be required to satisfy obligations under the Migratory Bird Treaty Act and other applicable Federal wildlife resource protection laws during construction of the reclaimed water line. Specific mitigation measures will be required related to the western burrowing owl (*Athene cunicularia*), especially to prevent disturbance during the breeding

season (March 1 to August 31). Mitigation measures and strategies will be outlined in an Avian Compliance Plan that is the City's responsibility to produce and approved by the NAFB Natural Resources Division and the US Fish and Wildlife Service. Monitoring of mitigation strategies will require an onsite biologist(s) to be present during construction activities, especially during nesting season.

1.3 Definitions

Active Nest: a nest of any migratory bird species which contains or exhibits sign of a migratory bird being present, present and brooding, present and laying eggs, and/or a nest containing eggs or young. Biologist(s) can also make such determinations by observations of the behavior of adult bird(s). Note that some migratory bird species do not actually build or use a standard nest; some species literally just lay eggs on the ground.

Migratory Bird Treaty Act: federal law that makes it unlawful for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird.

Migratory Birds: The migratory bird species protected by the Migratory Bird Treaty Act are listed in 50 CFR 10.13.

Migratory Bird Breeding and Nesting Season: in Clark County, Nevada, generally March 1 through August 31, however, birds may breed and nest outside this range of dates depending on multiple external environmental factors.

Maintenance Operations: any routine maintenance/repair activity conducted on Project facilities by an NV Energy employee, crew and/or contractor.

Routine Maintenance: *see* Maintenance Operations.

USAF: United States Air Force - base biologist.

USFWS: United States Fish and Wildlife Service, the federal agency with oversight and enforcement of the federal Migratory Bird Treaty Act.

Section 2 Migratory Birds

Almost all bird species that will be on or near the project site are protected by the Migratory Bird Treaty Act, which makes it unlawful to harm, injure or kill migratory birds, eggs or occupied nests during the breeding and nesting season. Migratory bird species with the potential to occur within or near the Project area may be found nesting on the open ground (i.e., no nest), in parked vehicles or equipment, within material staged on the ground, within open trenches, within open-ended pipes or other hollow materials, in trees and other vegetation, or any other type of small-opening types of cavities and vegetation that provide the type of shelter and perch opportunities sought by these species. Breeding and nesting birds will seek any source of shelter 1/2" or greater in size within which to build a nest to lay eggs. Implementation measures shall be followed to minimize impacts to migratory birds and avoid potential construction delay impacts.

2.1 General Information

NAFB Natural Resources Division has the responsibility to ensure that all Project components are constructed, operated and maintained in accordance with this Plan. Contractor and Construction Managers shall contact Jeff Kirkwood, Acting Natural Resource Program Manager at his direct line (702) 652-6410, or at jeffery.kirkwood.1@us.af.mil, if an emergency arises.

2.2 Design, Planning, Scheduling, and Project Initiation

A. Design all Project facilities and features, to the extent possible, not to utilize hollow, open-ended structures, posts, facilities, etc. to deter entry by migratory birds.

B. Plan and implement Project construction outside the migratory bird breeding and nesting season (i.e., September 1 to February 28) within Clark County, to the extent possible.

C. Plan and implement major ground-disturbing activities (i.e., grading, trenching, grubbing, etc.) outside the migratory bird breeding and nesting season (i.e., September 1 to February 28) within Clark County, to the extent possible.

D. Plan and initiate Project construction within Project areas and/or seasonal timing so as to avoid the migratory bird breeding and nesting season, or as much of the season and feasible.

E. Should project planning and scheduling cause all or any portion of the Project to be constructed during the migratory bird breeding and nesting season, then Project activities will be subject to potential exclusionary buffer(s) when and where active nests are discovered during the course of construction. Active nests shall be addressed as described in this Plan.

2.3 Environmental Compliance Protocols

A. On-site biologists coordinate through the Nellis AFB Natural Resources Division to implement environmental protocols over the course of the Project (see Appendix B)

B. Construction Manager with oversight over all staff, including subcontractors, to coordinate through Nellis AFB Natural Resources Division for the administration of environmental awareness training to all personnel who will be working on the Project. No personnel are authorized to work on site until having received this training and acknowledging by signature the understanding of the environmental concerns - laws and regulations concerning migratory birds, what to do when birds are observed on the Project, who to notify, the potential action to be taken and potentially enforced, and the potential for Project shut-down, or partial Project shut-down, by State and Federal agencies should these measures be ignored, violated or otherwise not followed.

2.4 On-site Activities and Actions by Biologists

A. Coordinate through the Nellis AFB Natural Resources Division, as approved by the USAF and USFWS, to inspect, clear, and close artificial and natural dirt burrows being utilized, or having the potential to be utilized by, but not containing active nests or nesting of any migratory bird species, particularly western burrowing owls.

B. Coordinate through the Nellis AFB Natural Resources Division, as approved by the USAF and USFWS, to inspect, clear, and collapse other natural dirt burrows (e.g. rodent burrows), as necessary or appropriate that could be enlarged for, and used by, western burrowing owls.

C. Coordinate through Nellis AFB Natural Resources Division should any artificial or natural dirt burrow, upon inspection, be observed to contain an active nest.

D. Coordinate through the Nellis AFB Natural Resources Division upon confirmation of an active migratory bird nest, to implement and enforce an exclusionary buffer from which all construction and construction activities must avoid for a duration as determined by the species and stage of the active nest observed. This determination will be made in consultation between the on-site biologist(s) and the Construction Manager. Exclusionary buffers may entail visible markers, such as wood lathe and flagging, just flagging, and/or signage. Such exclusionary buffers will be NO ADMITTANCE by anyone except the on-site biologists, Construction Manager and/or USAF or USFWS biologists with authority to do so, until such time that the buffer has been removed.

E. Conduct inspections of active nests with exclusionary buffers a maximum of once-a- week until the young of the nest have successfully fledged. The duration of each exclusionary buffer shall be dependent on the species and other external environmental factors as determined by the Nellis AFB Natural Resources Division.

2.5 On-site Activities and Actions by Construction Personnel

A. Any structures, posts, fencing, etc. that are hollow and/or have gaps or narrow open hollow spaces should be capped and/or closed, during construction to prevent entry and nesting by, or cause the death of, migratory birds.

B. Any material(s) staged on site should be tightly covered or sealed to prevent entry and nesting by, or cause the death of, migratory birds.

C. Any vehicle(s) or equipment planned to be staged or parked on site for more than 12 continuous hours should be removed from the Project site and brought back when needed. If that is not feasible, then such vehicles/equipment should be tightly wrapped, or implement some other non-harmful, non-lethal method to exclude small birds from entering and making nests within the undercarriage, engine compartment, open cab, wheel wells, tracks, exhaust pipe, etc.

D. Any nest and/or eggs discovered by any Project personnel anywhere on the Project should be reported immediately by the discoverer to their immediate supervisor and/or on-site biologist and/or the Construction Manager. Personnel should stop and cut-off all vehicles, equipment, tools, etc. in the immediate area as quickly as safe to do so, secure everything safely in place, and safely exit the immediate area. The biologist(s) will conduct an inspection and assess the situation. The biologist will make a determination of the bird activity and implement a course of action, in coordination with the Construction Manager as necessary. Action may include allowing the re-commencement of the work activity or removing everything from the area so the biologist can implement an exclusionary buffer for a period of time determined by the biologist, depending on the species of bird.

E. Upon vehicle or equipment walk-around, entry and/or start-up, if a worker or the operator observe any bird activity, such as flying out from an internal compartment or one or two birds flying around the worker with obvious agitated behavior, the operator should immediately cut-off the vehicle/equipment as quickly and safely as possible and leave the area to report to the supervisor, on-site biologist and/or the Construction Manager.

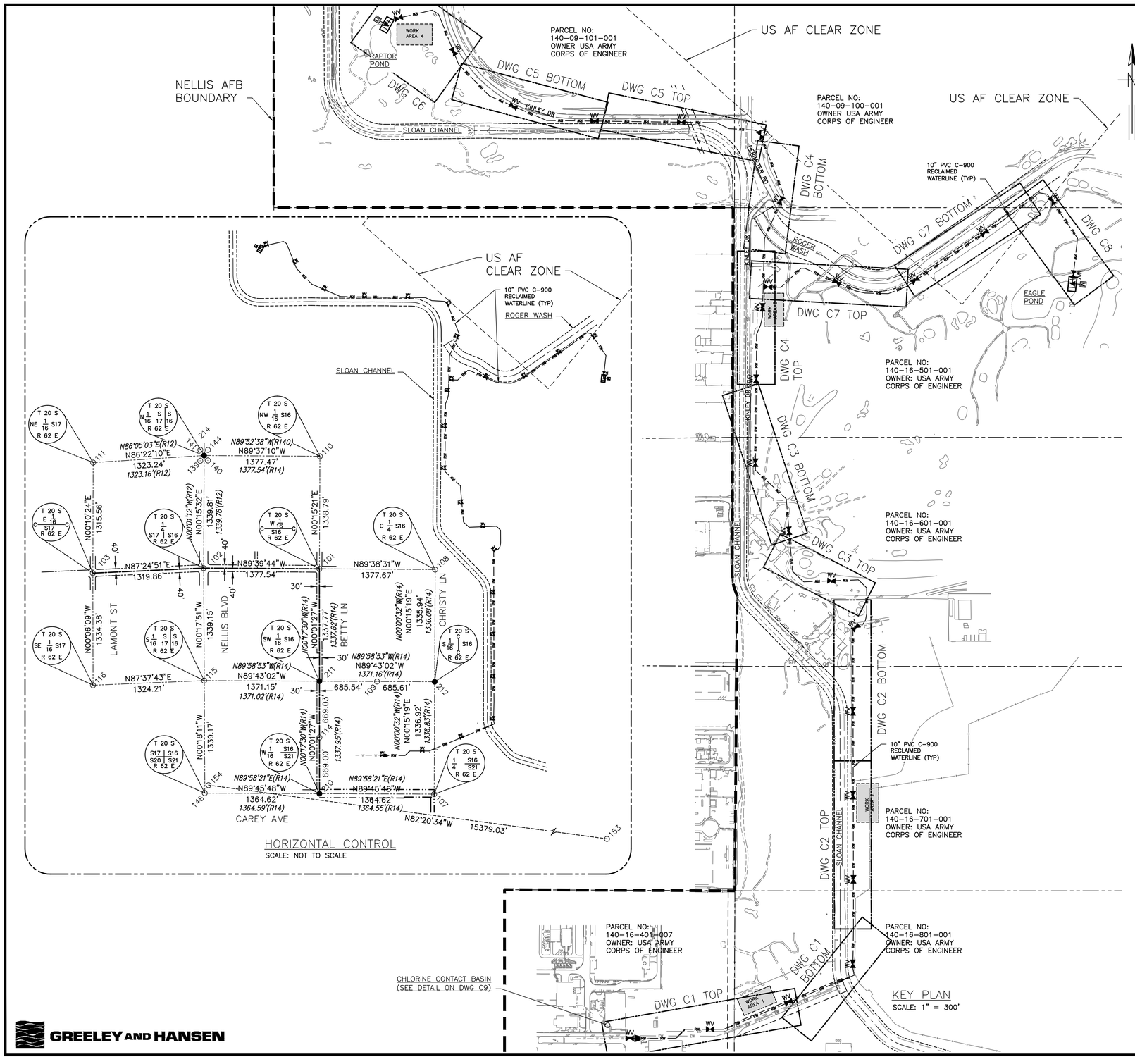
F. Should an exclusionary buffer be implemented by the on-site biologist(s), no Project personnel are authorized to enter such an area except as authorized or cleared by Nellis AFB Natural Resources Division, or until such time that the buffer has been removed by the on-site biologist(s). Violation of this measure may cause partial Project shut-down, full Project shut-down, and/or legal action or fines against the violator of the Migratory Bird Treaty Act.

Section 3 Post-Construction Monitoring

Post-construction maintenance operations will not be necessary as all of the construction will be limited to underground facilities.

Appendix A

Nellis Reclaimed Water Line Project Alignment and Trench Details



LINETYPE LEGEND

EXISTING		NEW	
	RIGHT OF WAY	0+00 RW	RECLAIMED WATER PIPE W/STATION MARKER
	EASEMENT		CONDUITS FOR TELECOMMUNICATION WIRES
	PROPERTY LINE		DEMOLITION LIMITS
X X X	FENCE		WORK AREA STAGING LIMITS (SEE NOTE 2)
W W	WATER PIPE		
RW	RECLAIMED WATER PIPE		
SD	STORM PIPE		
SS	SANITARY PIPE		
E	UNDERGROUND ELECTRIC		
F/O	UNDERGROUND FIBER OPTIC		
	CURB, GUTTER AND ASPHALT		
	CONCRETE PATHWAY		
(1810)	MAJOR CONTOUR LINE (5'-0" INTERVAL)		
(1809)	MINOR CONTOUR LINE (1'-0" INTERVAL)		

SYMBOL LEGEND

EXISTING		NEW	
	PALM TREE	RW WV	RECLAIMED WATER GATE VALVE
	SINGLE TREE	RW M	RECLAIMED WATER MOTORIZED PLUG VALVE
P	MISCELLANEOUS POST		REDUCER
2980.5 X	SPOT ELEVATION	RW	VERTICAL DEFLECTION
FH	FIRE HYDRANT	T M	TELECOMMUNICATION PULLBOX
	UTILITY METER	RW A	AIR RELEASE VALVE
	STREET LIGHT		
	LIGHT POLE		
	UTILITY POLE		
S	SIGNS		
	DOUBLE SIGNS		
	VALVE		
W	WATER MANHOLE		
S	SANITARY MANHOLE		
SD	DRAIN MANHOLE		
P	ELECTRICAL PULLBOX		
ET	ELECTRICAL TRANSFORMER		
E	ELECTRICAL MANHOLE		
HVP15 L809.12	HORIZONTAL CONTROL POINT		

GENERAL NOTES:

1. EXISTING UTILITY LOCATIONS ARE SHOWN APPROXIMATE AND ARE BASED ON RECORD DRAWINGS. OTHER UTILITIES MAY EXIST AND ARE NOT SHOWN. THE CONTRACTOR SHALL POTHOLE UTILITIES A MINIMUM OF 500 FEET AHEAD OF PIPE TRENCHING AND LAYING OPERATIONS TO ASCERTAIN POTENTIAL INTERFERENCES. ALL UTILITIES ENCOUNTERED AND DAMAGED SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARDS OF THE AFFECTED UTILITY. COORDINATE REPAIRS WITH RESPECTIVE UTILITY.
2. WORK AREA STAGING NUMBER UPON APPROVAL BY NAFB.
3. GEOTECHNICAL EVALUATION, NELLIS RECLAIMED WATERLINE PROJECT NELLIS AFB NV. PROJECT NO. 20153828E1 PREPARED BY GEOTECHNICAL & ENVIRONMENTAL SERVICES INC. 7150 PLACID STREET LAS VEGAS DATED JUNE 24, 2016.

150 0 150 300 FT

1"=300'

90% SUBMITTAL

GREELEY AND HANSEN

CITY OF NORTH LAS VEGAS – PUBLIC WORKS – ENGINEERING AND CONSTRUCTION SERVICES DIVISION

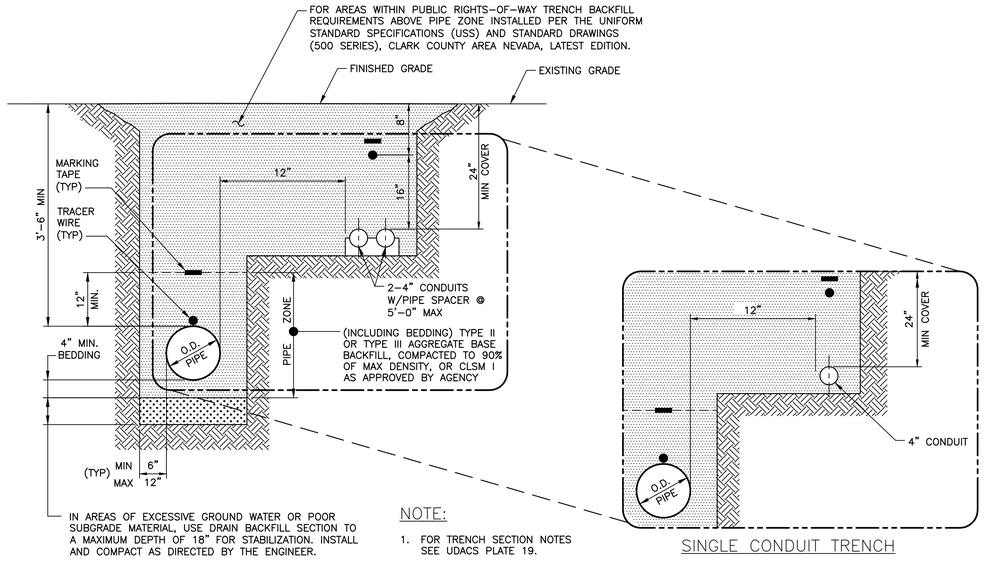
REVISIONS			
NO.	DESCRIPTION	DATE	BY

SCALE: 1" = 300'
DESIGN: D.GUERRERO
DRAWN: R. MORENO
CHECKED: C. TACKETT
APPROVED: X. XXXXXX
DATE: SEPTEMBER 2016

KEY PLAN, CIVIL SYMBOL LEGEND & HORIZ. CONTROL

NELLIS RECLAIMED WATER LINE
CIP PROJECT NO. S0048
CITY OF NORTH LAS VEGAS

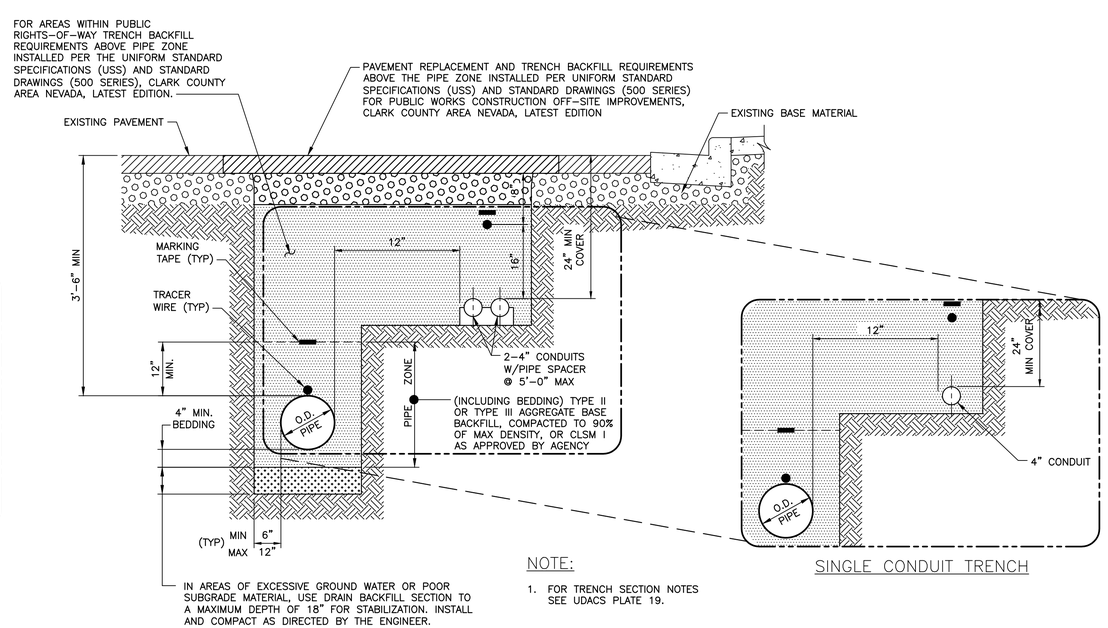
SHEET NO.
G4
SHEET 4 OF 27



NOTE:

1. FOR TRENCH SECTION NOTES SEE UDACS PLATE 19.

DETAIL 1/C12 – TRENCH UNDER UNIMPROVED AREAS
SCALE: NOT TO SCALE



NOTE:

1. FOR TRENCH SECTION NOTES SEE UDACS PLATE 19.

DETAIL 2/C12 – TRENCH UNDER IMPROVED AREAS
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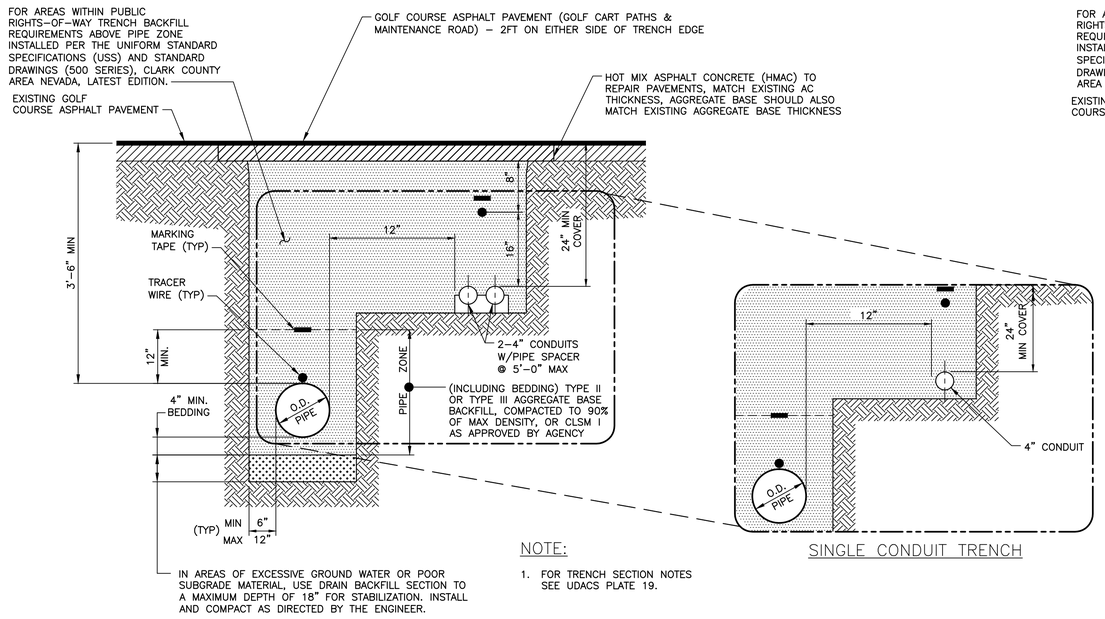
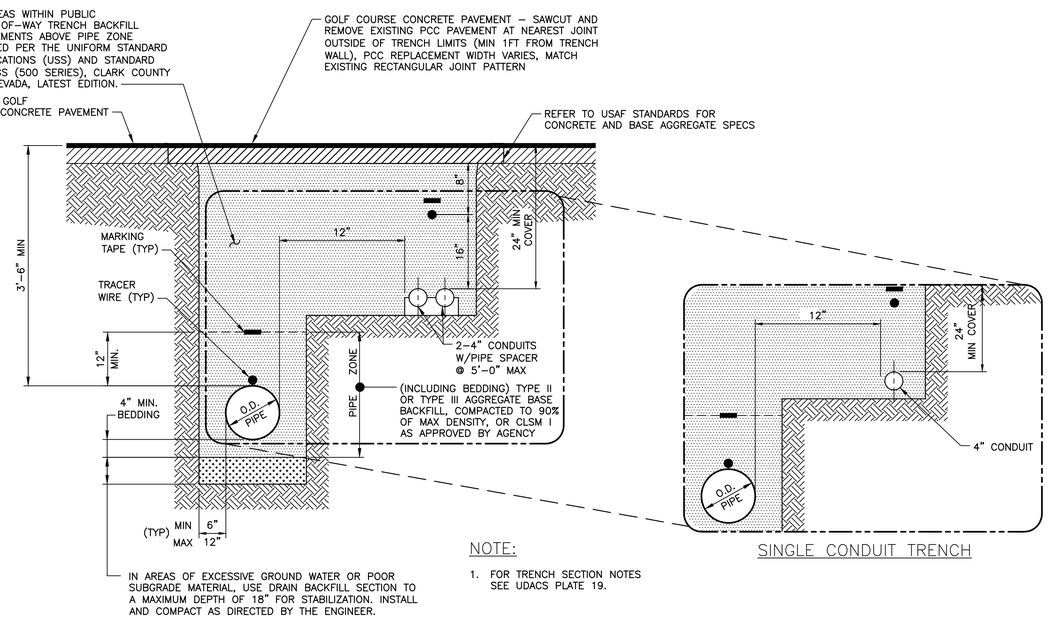


NOTE:

1. FOR TRENCH SECTION NOTES SEE UDACS PLATE 19.

DETAIL 3/C12 – TRENCH UNDER GOLF CART ASPHALT PAVEMENT
SCALE: NOT TO SCALE



NOTE:

1. FOR TRENCH SECTION NOTES SEE UDACS PLATE 19.

DETAIL 4/C12 – TRENCH UNDER GOLF CART CONCRETE PAVEMENT
SCALE: NOT TO SCALE

GREELEY AND HANSEN

90% SUBMITTAL

CITY OF NORTH LAS VEGAS - PUBLIC WORKS - ENGINEERING AND CONSTRUCTION SERVICES DIVISION

REVISIONS

NO.	DESCRIPTION	DATE	BY

SCALE: NOT TO SCALE
DESIGN: D. GUERRERO
DRAWN: R. MORENO
CHECKED: C. TACKETT
APPROVED: X. XXXXXXX
DATE: SEPTEMBER 2016

TRENCH DETAILS

NELLIS RECLAIMED WATER LINE
CIP PROJECT NO. S0048
CITY OF NORTH LAS VEGAS

SHEET NO.
C12
SHEET 16 OF 27

Appendix B

Environmental Protocols for Migratory Birds on Nellis Reclaimed Water Line Project

Environmental Protocols for Migratory Birds on Nellis Reclaimed Water Line Project

The following protocol shall be implemented by the third party biologist(s) supporting all components of the project, in coordination with Nellis AFB Natural Resources Division.

Dec: Review U.S. Air Force (USAF) burrowing owl GIS data.

Dec/Jan: Conduct an initial pedestrian survey of feeder line route to assess avian presence and use. Also survey all artificial burrows along the channel. Contractor and onsite biologist(s) to discuss findings to USAF biologist and Nellis AFB Natural Resources Division.

Jan 1 – Feb 28: Conduct weekly or bi-weekly pedestrian surveys of all project areas, including all artificial burrows along the channel, to assess avian presence and use, particularly burrowing owls. Conduct a minimum of four (4) such surveys at regular intervals. Contractor and onsite biologist(s) discuss findings to USAF biologist and Nellis AFB Natural Resources Division and coordinate on passive relocation techniques (i.e. temporary closure of artificial owl burrows) of any burrowing owls present, as necessary.

Duration of All Project Activities: Administer environmental awareness training to all new personnel prior to working on site. Maintain log of trainings, daily field notes, and associated photos and submit weekly to USAF biologist and Nellis AFB Natural Resources Division.

Within two (2) weeks prior to the first ground disturbing activity: Conduct a take avoidance survey to determine presence/use of migratory birds, and implement appropriately-sized exclusionary buffer zones as applicable, if within the nesting season.

Within twenty-four (24) hours prior to the first ground disturbing activity: Conduct a take avoidance survey to determine presence/use of migratory birds, and implement appropriately-sized exclusionary buffer zones as applicable, if within the nesting season.

Within two (2) weeks prior to any ground disturbing activities into a new area: Conduct a take avoidance survey to determine presence/use of migratory birds, and implement appropriately-sized exclusionary buffer zones as applicable, if within the nesting season. **(1)**

Within twenty-four (24) hours to any ground disturbing activities into a new area: Conduct a take avoidance survey to determine presence/use of migratory birds, and implement appropriately-sized exclusionary buffer zones as applicable, if within the nesting season. **(1)**

Ongoing During Nesting Season, approximately March 1 – August 31:

- Biological observation of nests and nesting activity within exclusionary buffer areas, if any, a maximum of once a week during the pertinent species' typical gestation periods. For species with long gestation periods, such as burrowing owls, observations may be spaced at bi-weekly intervals.

- Maintenance of exclusionary buffer zone boundaries (e.g. staking, flagging, etc.) as necessary.
- Removal of exclusionary buffer zone boundaries once nests are cleared by the onsite biologist(s), in coordination with USAF and Nellis AFB Natural Resources Division.
- Periodic inspection/survey of staged materials, vehicles and equipment onsite for migratory birds and nests.
- Respond to call of biological issues or concerns, and take appropriate action as necessary.

Note
(1) These two survey activities may be ongoing during the nesting season, depending on schedule and implementation of construction along the feeder line route and the plant site develop

Appendix K

Excerpt from the Previous EA

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

1. Name of Action.

ENHANCED USE LEASE OF U.S. AIR FORCE LANDS TO THE CITY OF NORTH LAS VEGAS FOR CONSTRUCTION AND OPERATION OF A WATER RECLAMATION FACILITY, NELLIS AIR FORCE BASE, NEVADA

2. Description of Proposed Action and Alternative Actions

Proposed Action:
The U.S. Air Force (USAF) proposes to initiate an Enhanced Use Lease (EUL) with the City of North Las Vegas (CNLV) for 40 acres of Nellis Air Force Base (AFB) property located at the southwest corner of the installation. The Nellis AFB property is currently developed as part of the Nellis AFB Sunrise Golf Course. The CNLV would construct a water reclamation facility (WRF) on the property in phases as population increases and other conditions warrant. The initial phase of the WRF would treat approximately 20 million gallons of wastewater per day (mgd); ultimate capacity would be 50 mgd.

The WRF would include closed treatment basins, administration and maintenance buildings, warehouse buildings, pump stations and wastewater treatment process structures, and parking space for employees and moveable equipment. All of the treatment basins would be primarily below ground level, with approximately 6 feet visible above ground. The buildings would be painted to match the surrounding desert landscape, and the tallest structure would be 55 feet tall.

The WRF would use advanced membrane technology, ultra-violet (UV) disinfection, completely filtered air emissions for odor control, and solids reduction technology. A wall and fence would be constructed to surround the WRF, and access would be secured 24 hours per day, seven days per week.

The CNLV would supply Nellis AFB with reclaimed water from the WRF sufficient to irrigate the golf course, as well as for other non-potable uses on the installation. Excess reclaimed water would be discharged to Sloan Channel, located approximately 500 feet east of the property. The EUL to the CNLV for the WRF would also provide the USAF with funds to repair aging infrastructure.

Alternative Actions:
Alternatives to the Proposed Action were previously addressed in an Environmental Assessment (EA) developed for the Bureau of Reclamation (RECLAMATION) by the CNLV in 2007. One of the previously assessed alternative actions, denoted as the Frehner Site Alternative, is a viable alternative to the Proposed Action for RECLAMATION and the CNLV.

For the Frehner Site Alternative, the CNLV would construct a WRF on a 21-acre CNLV-owned site located on Frehner and Losee Roads. The components of the WRF would be similar to those described for the Proposed Action, but the Frehner Site WRF would be configured differently to fit the smaller area. The pipeline and lift station infrastructure required for operation of a WRF on the Frehner site would be substantial in comparison to the Proposed Action.

The primary disadvantage to the Alternative Action for the public is that the significantly larger pipeline and lift station infrastructure that would be constructed would result in substantially higher project costs. Higher project costs would result in higher utility costs and higher taxes for CNLV residents and customers in Clark County and surrounding communities. In addition, the Frehner Site is half of the size of the Proposed Action site, which would limit future WRF capacity expansion.

The primary disadvantage to the Alternative Action for the USAF would be that an EUL with the CNLV for construction and operation of a WRF would not be accomplished and, therefore, the USAF would not receive funding from the CNLV for infrastructure repairs. Also, Nellis AFB would not receive reclaimed water as described in the Proposed Action.

No Action Alternative:
Under the USAF No Action Alternative, no EUL to the CNLV would be executed. The CNLV would not construct a WRF on Nellis AFB. The CNLV would not provide Nellis AFB with reclaimed water from a WRF on Nellis AFB for golf course irrigation and other non-potable purposes. Nellis AFB would continue to draw from the Las Vegas Valley aquifer system to irrigate the Sunrise Golf Course.

3. Summary of Environmental Resources and Impacts

Land Use: Change from military recreational use to civil public use, impacts would be insignificant. Beneficial effects for Nellis AFB due to reduced Bird Aircraft Strike Hazard (BASH) issues.

Geology and Soils: Minor impacts on soils during construction, no impacts on geology resources.

Aesthetics: Change from open recreation space to civil industrial site, insignificant impacts due to mitigation with landscaping and reduced visual intrusion, and industrial nature of adjacent properties.

Air Quality: Minor temporary impacts during construction, no impacts during WRF operation.

Noise: Insignificant impacts during construction. Site is located within the 70 DNL noise contour for Nellis AFB aircraft effects.

Water Resources: Long-term cumulative beneficial effects for Nellis AFB and surrounding communities due to reduced groundwater withdrawal.

Biological Resources: No significant impacts due to disturbed nature of the current site. No listed species impacts, since none are present on the site.

Socioeconomics: Long-term beneficial effects for surrounding communities due to reduced wastewater treatment costs.

Environmental Justice: No disproportionate health or environmental impacts on the community of Sunrise Manor. Benefits of lower wastewater treatment costs would be for all members of the community.

Protection of Children: Insignificant short-term impacts during construction would be mitigated by safety controls on the construction site.

Cultural Resources: No impacts, since no cultural resource sites are present.

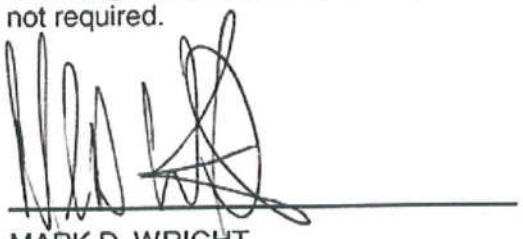
Hazardous and Toxic Substances: Insignificant impacts during construction would be mitigated by use of Best Management Practices (BMPs) to control possible equipment fluids spills.

Safety: No impacts; all OSHA requirements would be followed. Safety and emergency response would shift from Nellis AFB to Clark County.

Cumulative Impacts: No significant adverse cumulative impacts would result from the Proposed Action; and significant beneficial cumulative effects would result for Nellis AFB and the CNLV and surrounding communities due to savings of millions of dollars on wastewater treatment costs and the significant reduction of groundwater withdrawal by Nellis AFB and others for non-potable uses.

4.0 Conclusions

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) is warranted, and an Environmental Impact Statement (EIS) is not required.



MARK D. WRIGHT
Colonel, USAF
Deputy Director of Installations and Mission Support

Date

RECLAMATION
Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

FINDING OF NO SIGNIFICANT IMPACT
(FONSI)
(LC-08-019-FONSI)

Enhanced Use Lease of U.S. Air Force Lands to the City of North Las Vegas for Construction and Operation of a Water Reclamation Facility
Nellis Air Force Base, Clark County, Nevada

Based on a thorough review of the analysis of the environmental impacts presented in the attached Environmental Assessment, the Bureau of Reclamation (Reclamation), Lower Colorado Regional Office, concludes that implementation of the proposed action does not constitute a major federal action significantly affecting the quality of the human and biological environment within the project area. Therefore, an Environmental Impact Statement is not required and Reclamation is issuing this FONSI. The Enhanced Use Lease by the United States Air Force with the City of North Las Vegas (CNLV) would allow the construction of a 50 million gallon per day water reclamation facility (WRF). Reclamation's action is to provide partial funding to the CNLV, subject to Congressional appropriation and availability of funding, under Section 1620 of the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (P.L. 102-575, Title XVI), as amended by the Reclamation Recycling and Water Conservation Act (P.L. 104-266). Reclaimed water from the WRF would be used by Nellis Air Force Base for golf course irrigation and other suitable non-potable uses. Excess reclaimed water would be discharged to Sloan Channel, located approximately 500 feet east of the property.

The FONSI has, therefore, been prepared and is submitted to document environmental review and evaluation of the proposed action in compliance with the National Environmental Policy Act of 1969, as amended.

Prepared: _____ Date 5/9/2008
Natural Resources Specialist

Recommended: _____, Acting Date 5/9/2008
Environmental Compliance Group Manager

Approved: _____ Date 5-9-08
William J. Liebhauser, Director
FOR Resources Management Office