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SOUTHERN TRANSMISSION SYSTEM REPLACEMENT PROJECT ENVIRONMENTAL ASSESSMENT

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Acronyms

µg/m^3	micrograms per cubic meter
ABS	Activity-Based Sampling
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
amsl	above mean sea level
APE	Area of Potential Effect
AQCR	Air Quality Control Region
Arcadis	Arcadis U.S., Inc.
ATV	all-terrain vehicle
BAQP	Bureau of Air Quality Planning
BCC	Bird of Conservation Concern
BCCE	Boulder City Conservation Easement
BCR	Bird Conservation Region
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CCRFCD	Clark County Regional Flood Control District
CEA	Cumulative Effects Area
CFR	Code of Federal Regulations
CO	carbon monoxide
CRIT	Colorado River Indian Tribes
CSWPP	Community Source Water Protection Plan
CWA	Clean Water Act
dBA	A-weighted decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
g	gravity

GHG	greenhouse gas
GIS	geographic information system
HAP	hazardous air pollutant
HDD	horizontal directional drilling
IOP	Interagency Operating Procedure
IPaC	Information for Planning and Conservation
ISWPP	Integrated Source Water Protection Program
L_{eq}	equivalent continuous sound level
LVFO	Las Vegas Field Office
LWC	lands with wilderness characteristics
m	meter
MBTA	Migratory Bird Treaty Act
MCL	midline carapace length
MLA	Mineral Leasing Act
MSHCP	Multiple Species Habitat Conservation Plan
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAPCP	Nevada Air Pollution Control Program
NARA	National Archives and Records Administration
NDA	Nevada Department of Agriculture
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Department of Water Resources
NEA	Negative Exposure Assessment
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NH_3	ammonia
NHD	National Hydrography Dataset
NOA	naturally occurring asbestos
NO_x	oxides of nitrogen
NPS	National Park Service
NRCS	Natural Resource Conservation Service

NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NTP	Notice to Proceed
NWI	National Wetland Inventory
O_3	ozone
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
Pb	lead
PBO	Programmatic Biological Opinion
PE	polyethylene
PEL	Permissible Exposure Limit
PFYC	Potential Fossil Yield Classification
PGA	peak ground acceleration
PLS	pressure limiting station
PM_{10}	particulate matter less than 10 microns in size
$PM_{2.5}$	particulate matter less than 2.5 microns in size
POD	Plan of Development
ppb	parts per billion
ppm	parts per million
Project	Southern Transmission System Replacement Project
Proponent	Southwest Gas Corporation
psig	pounds per square inch gauge
PUP	Pesticide Use Proposal
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
ROW	right-of-way
R-U	Rural Open Land
SCNCA	Sloan County National Conservation Area
SHPO	State Historic Preservation Office
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SNDO	Southern Nevada District Office
SO_2	sulfur dioxide

SPCC	Spill Prevention, Control, and Countermeasure
SRMA	Special Recreation Management Area
SSS	Soil Survey Staff
SWG	Southwest Gas Corporation
SWPA	Source Water Protection Area
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TUP	temporary use permit
UDP	Unanticipated Discovery Plan
USACE	U.S. Department of Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTV	utility terrain vehicle
VOC	volatile organic compound
VRM	visual resource management
WEG	wind erodibility group
WOTUS	waters of the U.S.
WSA	Wilderness Study Area
WSS	Web Soil Survey

Chapter 1 Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental effects of constructing a linear right-of-way (ROW) for a steel natural gas pipeline in Clark County, Nevada (the Proposed Action). This EA will assist the Bureau of Land Management (BLM) Las Vegas Field Office (LVFO) in project planning, complying with the National Environmental Policy Act (NEPA), and determining whether any significant effects could result from the analyzed actions. Following the requirements of NEPA (40 CFR 1500), this EA describes the potential impacts of the Proposed Action and the No Action Alternative. If the BLM determines that the Proposed Action is not expected to have major effects, a Finding of No Significant Impact (FONSI) will be issued, and a Decision Record will be prepared. If significant effects are anticipated, the BLM will prepare an Environmental Impact Statement or select the No Action Alternative.

1.1 Location of the Proposed Action

Southwest Gas Corporation (SWG; the Proponent) is proposing to install 69.5 miles of new 24-inch-diameter steel natural gas pipeline within SWG existing permanent ROWs. The Southern Transmission System Replacement Project (Project) is expected to be constructed in three phases over the next 5 to 10 years and have an overall life of approximately 30 years. The Project inception point is located at SWG's existing pressure limiting station (PLS) near Laughlin, Nevada, and the proposed pipeline alignment runs parallel to existing SWG natural gas pipelines roughly following U.S. Highway 95, west of Searchlight, Nevada, terminating at SWG's existing PLS just south of Henderson, Nevada (**Figure 1; Appendix E**). The Project is located in Clark County, Nevada (on BLM, Boulder City, and County-administered lands).

The Project would require the installation of pipeline in Clark County, Nevada. The pipeline passes through or near portions of Searchlight, Boulder City, and Henderson, Nevada. The pipeline would be installed within a combination of BLM land grants, Clark County ROW, Boulder City ROW, and Nevada Department of Transportation (NDOT) ROW.

The total Project area is located on 1,450.69 acres of land, of which 1,012.61 acres are BLM-administered lands. This represents the total acres of land that would be used for the Project and includes existing permanent ROW, temporary use permit (TUP)/temporary easement workspace, TUP/temporary easement staging areas, and TUP /temporary easement access roads. The Project area is located on land previously disturbed for other projects including installation of the existing SWG pipelines as well as portions of land that was not disturbed or vegetation has recovered since the initial disturbance. Impacts on BLM-administered land per Project phase are summarized in **Table 1** including 478.71 acres of existing permanent ROW, 442.15 acres TUP/temporary easement workspace, 29.22 acres for TUP/temporary easement staging areas, and 62.53 acres for TUP/temporary easement access roads. The complete legal description for the Project on BLM-administered land is provided in **Appendix F**.

Table 1 Acres by Project Phase[a]

Disturbance Type	Total Project Area (acres) BLM-Administered Land and Non-BLM Land[b]			Total Project Area (acres) on BLM-Administered Land[c]			Project Area Ground Disturbance (acres) on BLM-Administered Land[d]		
	Phase I	Phase II	Phase III	Phase I	Phase II	Phase III	Phase I	Phase II	Phase III
Existing Permanent Pipeline Right-of-way	251.39	150.47	290.58	157.62	66.67	254.42	123.68	53.04	191.69
TUP /Temporary Easement Pipeline Workspace	242.80	113.06	258.95	160.59	49.55	232.01	159.36	49.55	231.97
TUP /Temporary Easement Staging Areas	17.68	7.48[e]	20.89	12.44	3.46	13.32	13.32	12.06	3.46
TUP /Temporary Easement Access Roads	26.18	25.16	46.05	12.74 [f]	4.18	45.61	0.00	4.04	3.21
Total Acreages by Phase	**538.05**	**296.17**	**616.46**	**343.39**	**123.87**	**545.36**	**295.1**	**110.1**	**440.19**
Totals Acreages	**1,450.69**			**1,012.61**			**845.39**		

Notes:

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends in this table.

b The Project area represents the total acres of land utilized for the Project and includes existing permanent ROW, TUP /temporary easement pipeline workspace, TUP /temporary easement staging areas, and TUP /temporary easement access roads on both BLM-Administered Land and Non-BLM Land.

c Project area ground disturbance consists of the portions of the Project area where vegetation would be removed and revegetated. The Project area includes a number of existing roads on BLM and private land that would be utilized during construction resulting in no additional ground disturbance or improvements and/or change in existing conditions. As such, it is anticipated that those portions of the Project area that are currently used as existing roads would either not be disturbed or would not require restoration as they will remain as access roads consistent with current condition and vegetation. Therefore, use of these existing roads are not included in the Project area ground disturbance calculation.

d Project area ground disturbance consists of the portions of the Project area where vegetation would be removed and revegetated. The Project area includes a number of existing roads on BLM and private land that would be utilized during construction resulting in no additional ground disturbance or improvements and/or change in existing conditions. As such, it is anticipated that those portions of the Project area that are currently used as existing roads would either not be disturbed or would not require restoration as they will remain as access roads consistent with current condition and vegetation. Therefore, use of these existing roads are not included in the Project area ground disturbance calculation.

e TUP/Temporary Easement Staging Area 1 would be used in Phase I and III. Acres of total Project Area associated with TUP/Temporary Easement Staging Area 1 is only included in Phase I. TUP/Temporary Easement Staging Area 8 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Staging Area 8 is only included in Phase I.

f TUP/Temporary Easement Access Road 1 would be used in Phase I and III. Acres of total Project area associated with TUP/Temporary Easement Access Road 1 is only included in Phase I. TUP/Temporary Easement Access Road 10 would be used in Phase I and II. Acres of total Project area associated with TUP/temporary Easement Access Road 10 is only included in Phase I.

The Project area includes a number of existing roads on BLM and private land that would be utilized during construction resulting in no additional ground disturbance or improvements or change in existing conditions. As such, it is anticipated that the portions of the Project area that are currently used as existing roads would either not be disturbed and/or would not require restoration as they would remain as access roads consistent with current conditions and vegetation.

Ground disturbance is not anticipated within the entire Project area. Ground disturbance within the Project area (Project area ground disturbance) would result in 845.39 acres of impacts to vegetation on BLM-administered land. This represents the total land area where ground disturbance (e.g. vegetation removal) is anticipated. The existing access roads (including the existing pipeline access road) where no new grading is anticipated are not included in the Project area ground disturbance calculation. The Project area ground disturbance on BLM-administered land includes approximately 368.41 acres of existing permanent ROW, 440.88 acres of TUP/temporary easement pipeline workspace, 28.84 acres of TUP/temporary easement staging areas, and 7.25 acres associated with TUP/temporary easement access roads.

1.2 Purpose and Need

Because of growing demand and existing pre-code vintage steel infrastructure, the SWG stated need is to replace old utilities with modern materials using current construction standards and practices. The purpose of the Project would be to improve reliability and safety while decreasing maintenance needs. Additionally, the Project would allow SWG to maintain operating flexibility

and take advantage of lower natural gas rates as they become available from other natural gas sources south of the Project.

The BLM's purpose is to respond to SWG request for use of public lands managed by the BLM for the construction, operation, maintenance, and termination of a natural gas pipeline to replace multiple outdated natural gas pipelines with a single natural gas pipeline. The need for the Proposed Action is established by the Mineral Leasing Act of 1920 (MLA), as amended (30 United States Code [U.S.C.] 181 et seq.) under the authority of the Secretary of the Interior, through the BLM.

1.2.1 Decision to be Made

The BLM will decide whether to deny the proposed ROW, grant the ROW, or grant the ROW with modifications. The BLM may include any terms, conditions, and stipulations it determines to be in the public interest and may modify the proposed use or change the route or location of the proposed facilities (43 CFR Part 2880). In the decision process, the BLM must consider how the BLM's resource management goals, objectives, opportunities, and/or conflicts relate to this non-federal use of public lands.

1.3 Conformance Summary and Relationship to Other Plans and Analyses

This EA has been prepared in accordance with the following statutes, regulations, policies, and procedures:

- National Environmental Policy Act of 1969, as amended (Public Law 91-190, 42 U.S.C. 4321 et seq.).
- National Historic Preservation Act and H-1780 Guidelines for Improving & Sustaining BLM-Tribal Relations.
- 40 Code of Federal Regulations (CFR) 1500 et seq.: Regulations for Implementing the Procedural Provisions of NEPA.
- BLM NEPA Handbook (H-1790-1; BLM 2008).
- MLA, as amended.
- Clark County Title 30 Development Code (Clark County 2000a).
- Clark County Multiple Species Habitat Conservation Plan (Clark County 2000b).
- Las Vegas Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS; BLM 1998).

1.3.1 Permits and Approvals

Table 3; Appendix A provides a list of federal, state, and local permits, authorizations, or interagency consultations that may be required for the Project.

Chapter 2 Proposed Action and Alternatives

This chapter describes and compares the Proposed Action and No Action Alternative considered for the Project. Alternatives considered but eliminated from detailed study are also discussed.

Only reasonable alternatives need be considered in detail, as specified in 40 CFR 1502.14(a). Reasonable alternatives must be feasible, and such feasibility must focus on the accomplishment of the underlying purpose and need (of the applicant or the public) that would be satisfied by the proposed federal action.

2.1 No Action Alternative

Under the No Action Alternative, the ROW grant would not be approved, and the gas line would not be installed, preventing the delivery of natural gas via a new, 24-inch, steel natural gas pipeline that would replace multiple existing lines. Additionally, the existing pipelines would not be abandoned in place and would remain in operation.

If the No Action Alternative is selected, a higher level of effort to maintain the existing lines would likely be necessary to ensure reliability and safety equal to that of a new replacement line. Leaving the existing lines in operation would not improve reliability or safety.

2.2 Proposed Action

SWG is proposing to install 69.5 miles of new, 24-inch-diameter, steel natural gas pipeline within SWG existing permanent ROW. No new permanent ROW is proposed. It is expected that the Project would be constructed in three separate phases (Phases I, II, and III), with Phase I constructed within the next 5 years. Additional phases are expected to be constructed following Phase I; however, construction timelines for additional phases are not precisely known. The order that the Phases are constructed may not follow numerical order and all phases could be constructed at one time. SWG is anticipating the construction of the three phases to occur within the next 5 to 10 years. SWG is applying for a TUP on BLM-administered land for the first phase of construction. SWG would apply for TUP on BLM-administered land associated with Phase II and Phase III when the construction schedules for those phases are determined. **Appendix B** describes the construction, operations, and maintenance of the proposed facilities.

The ROW amendment request would also consolidate the existing SWG collocated ROWs into one BLM authorization that would include the new pipeline and the existing pipelines. **Table 4; Appendix A** and **Figure 2; Appendix E** describe existing BLM authorizations and locations.

Before decommissioning the existing pipelines, SWG would request to abandon in place the existing pipelines, and BLM would issue a notice to proceed to SWG. Once the pipelines are decommissioned, SWG would notify BLM, and the pipelines would be removed from the grant.

2.2.1 Phase I: Searchlight Crossover to Eldorado Tap

Phase I of construction would begin south of Searchlight, at the Searchlight Crossover, at approximately Project milepost 29.0, and would end at the Eldorado Tap, approximately at Project milepost 56.2, for a total of approximately 27.2 miles (**Figure 3; Appendix E**). This phase crosses 18.0 miles of BLM-administered land, 0.3 mile of NDOT ROW, 8.1 miles of Boulder City land, and 0.9 mile of private land.

During Phase I, SWG would abandon in place the existing 650 pounds per square inch gauge (psig) pipeline between Project milepost 29 and milepost 56.2. Additionally, SWG would abandon in place a lower pressure pipeline that has an operating pressure of 500 psig from the Intersection Point Station to Horizon Ridge PLS (Project milepost 0.0 to milepost 69.5).

The new pipeline would be installed within SWG's existing BLM ROW. In addition, in order to continue to service a customer on the northern end of Searchlight, SWG would install a new 4-inch-diameter polyethylene (PE) pipe within SWG existing ROW, NVN-0060005. The new PE pipe would tap into the new 24-inch-diameter pipeline in Section 3 Township 28 South Range 63 East and terminate in Section 14 Township 28 South Range 63 East (**Figure 1–3**). The installation of the new PE pipeline would either be by open trench or insertion into the abandoned pipeline that is within NVN-0060005. The insertion method would require trenching bell holes approximately every 300 to 400 feet. A regulator station would also be installed near the tap site at the new 24-inch pipeline. The disturbance calculation shown in **Table 1** includes the maximum disturbance of a 50-foot wide disturbance for a length of 2.89 miles. Disturbance is not included where the PE pipe ROW overlaps with an existing road.

No new permanent ROW would be needed. The width of the existing permanent ROW varies from 50 to 86 feet throughout Phase I and is within portions of what has already been disturbed from the installation of the existing pipelines and the adjacent operations and maintenance road. Acreages of Project area ground disturbance, where vegetation may be removed, are shown in **Table 1; Section 1.1**.

TUP/temporary easement pipeline workspace is needed along the permanent ROW to facilitate safe construction and would be used for workspace, staging equipment, storing spoils, and providing a lane(s) of construction traffic. When fencing is encountered, the TUP/temporary easement pipeline workspace would be reduced to match the fence line.

Eight TUP/temporary easement staging areas are also planned for this phase. Six are located on BLM-administered land (12.44 acres total), and a portion of one is on NDOT ROW. Widths of the TUP/temporary easement staging areas vary. The proposed TUP/temporary easement staging areas are described below and shown on **Figure 3; Appendix E**).

- TUP/Temporary Easement Staging Area 1 (Project milepost 29.6): A TUP/temporary easement staging area, 3.13 acres (200 feet x 809 feet x 324 feet x 554 feet), will be located on the east side of U.S. Highway 95 on BLM-administered land.
- TUP/Temporary Easement Staging Area 2 (Project milepost 30.0): A portion of the TUP/temporary easement staging area, 1.62 acres (200 feet x 675 feet x 426 feet x 300 feet), will be located on the west side of U.S. Highway 95 on BLM-administered land and 0.62 acres on NDOT ROW.
- TUP/Temporary Easement Staging Area 3 (Project milepost 33.2): A TUP/temporary easement staging area, 1.71 acres (208 feet x 400 feet x 200 feet x 344 feet), will be located on the south side of Joshua Tree Highway (State Route 164) on BLM-administered land.
- TUP/Temporary Easement Staging Area 4 (Project milepost 34.2): A TUP/temporary easement staging area, 2.96 acres (220 feet x 553 feet x 273 feet x 645 feet), will be located in area that is previously disturbed on private land.

- TUP/Temporary Easement Staging Area 5 (Project milepost 37.8): A TUP/temporary easement staging area, 3.04 acres (225 feet x 825 feet x 522 feet x 474 feet), will be located on the south side of Access Road 5 on BLM-administered land.
- TUP/Temporary Easement Staging Area 6 (Project milepost 44.3): A TUP/temporary easement staging area, 1.84 acres (200 feet x 400 feet x 200 feet x 400 feet), will be located on the west side of U.S. Highway 95 on BLM-administered land.
- TUP/Temporary Easement Staging Area 7 (Project milepost 47.6): A TUP/temporary easement staging area, 1.11 acres (155 feet x 343 feet x 150 feet x 300 feet), will be located on the south side of Access Road 8 on BLM-administered land.
- TUP/Temporary Easement Staging Area 8 (Project milepost 56.2): A TUP/temporary easement staging area, 1.65 acres (489 feet x 150 feet x 500 feet x 142 feet), will be located south of Eldorado Valley Drive on Boulder City land.

Ten existing TUP/temporary easement access roads have been identified for construction of Phase I (**Figure 3; Appendix E**) and are described below. All, or portions, of seven TUP/temporary easement access roads are located on BLM-administered land and none of them would require any upgrades for construction.

- TUP/Temporary Easement Access Road 1/Tip Top Well Road (Project milepost 29.1): Existing road with soil surface. The road is approximately 18 feet wide and the proposed use of the road is approximately 1,007 feet long with approximately 834 feet located on BLM-administered land (0.34 acre).
- TUP/Temporary Easement Access Road 2 (Project milepost 30.0): Existing unnamed road with soil surface, located within NDOT ROW, that connects to U.S. Highway 95. The road is approximately 18 feet wide and the proposed use of the road is approximately 112 feet long (0.05 acre).
- TUP/Temporary Easement Access Road 3a/b Joshua Tree Highway (State Route 164; Project milepost 33.3): Existing paved road (access point east and west of highway). The road is approximately 18 feet wide and the proposed use of the road is approximately 5,658 feet long (2.33 acres).
- TUP/Temporary Easement Access Road 4 (Project milepost 35.3): Existing unnamed road with soil surface, located on BLM-administered land and private land. The road is approximately 18 feet wide and the proposed use of the road is approximately 4,360 feet long with approximately 1,419 feet located on BLM-administered land (0.59 acre).
- TUP/Temporary Easement Access Road 5 (Project milepost 37.8): Existing unnamed road with soil surface, located on BLM-administered land. The road is approximately 18 feet wide and the proposed use of the road is approximately 2,068 feet long, with approximately 2,050 feet located on BLM-administered land (0.84 acre).
- TUP/Temporary Easement Access Road 6 (Project milepost 44.3): Existing unnamed road with soil surface, located within NDOT ROW, that connects to U.S. Highway 95. The road is approximately 18 feet wide and the proposed use of the road is approximately 192 feet long all located on BLM-administered land (0.08 acre).

- TUP/Temporary Easement Access Road 7 (Project milepost 44.9): Existing unnamed road with soil surface that connects to U.S. Highway 95. The road is approximately 18 feet wide and the proposed use of the road is approximately 181 feet long all located on BLM-administered land (0.07 acre).
- TUP/Temporary Easement Access Road 8 (Project milepost 47.6): Existing unnamed road with soil surface, located on BLM-administered land, that connects to U.S. Highway 95. The road is approximately 18 feet wide and the proposed use of the road is approximately 180 feet long all located on BLM-administered land (0.07 acre).
- TUP/Temporary Easement Access Road 9 (Project milepost 53.9): Existing unnamed road with soil surface, located on Boulder City land and NDOT ROW. The road is approximately 18 feet wide and the proposed use of the road is approximately 4,423 feet long.
- TUP/Temporary Easement Access Road 10/Eldorado Valley Drive (Project milepost 56.2): Existing paved road located on Boulder City land and NDOT R O W. The road is approximately 18 feet wide and the proposed use of the road is approximately 7,380 feet long.
- TUP/Temporary Easement Access Road 22 (Project milepost 29.1): Existing road with soil surface. The road is approximately 18 feet wide and the proposed use of the road is approximately 37,895 feet long with approximately 26,013 located on BLM-administered land (10.74 acres).

The TUP/temporary easement access roads described above are the main access roads that would be used during construction of Phase I; however, TUP/temporary easement access roads identified in Phases II and III could also be used during construction of Phase I.

During operations, Access Road14/Horizon Ridge Parkway, Access Road 10/Eldorado Valley Drive, and Access Road 17/Christmas Tree Pass Road, and Access Road 22 would be used for access. These are the roads that SWG currently uses for operations as well.

2.2.2 Phase II: Eldorado Tap to Horizon Ridge Pressure Limiting Station

Phase II of construction would begin at the Eldorado Tap (at approximately Project milepost 56.2) and end at the Horizon Ridge PLS (at Project milepost 69.5) for a total of approximately 13.29 miles (**Figure 4; Appendix E**). This phase crosses 5.46 miles of BLM-administered land and 7.83 miles of Boulder City land.

Phase II of construction would replace the existing 650 psig pipelines with a new 24-inch-diameter pipeline. The existing 711 psig 24-inch-diameter pipeline would remain in place and operational.

The new pipeline would be installed within the existing BLM grant. No new permanent ROW is needed. The width of the existing permanent ROW varies from 86 to 100 feet and is within portions of what has already been disturbed from the installation of the existing pipelines and the adjacent operations and maintenance road. Acreages of Project area ground disturbance, where vegetation may be removed, are shown in **Table 1; Section 1.1.**

TUP/temporary easement pipeline workspace, needed along the permanent ROW to facilitate safe construction, would be used for workspace, staging equipment, storing spoils, and providing a lane(s) of construction traffic. When fencing is encountered, the TUP/temporary easement pipeline workspace would be reduced to match the fence line.

Five TUP/temporary easement staging areas are also planned for this phase, and two are located on BLM-administered land that occupy 3.46 acres. It would be located at the Horizon Ridge PLS within the 150-foot-wide TUP/temporary easement pipeline workspace. Widths of the TU P/temporary staging areas vary.

- TUP/Temporary Easement Staging Area 8 (Project milepost 56.2: A staging area, 1.65 acres (489 feet x 150 feet x 500 feet x 142 feet), will be located south of Eldorado Valley Drive on Boulder City land.
- TUP/Temporary Easement Staging Area 9 (Project milepost 59.5): A staging area, 1.65 acres (150 feet x 400 feet x 150 feet x 400 feet), will be located on Boulder City land.
- TUP/Temporary Easement Staging Area 10 (Project milepost 60.9): A staging area, 2.30 acres (284 feet x 400 feet x 200 feet x 602 feet), will be located south of an access road on Boulder City land.
- TUP/Temporary Easement Staging Area 11 (Project milepost 66.3): A staging area, 1.48 acres (155 feet x 450 feet x 412 feet x 150 feet), will be located south of an access road on BLM-administered land and (1.42 acres) and Boulder City land (0.06 acre).
- TUP/Temporary Easement Staging Area 12 (Project milepost 69.5): A staging area, 2.04 acres (150 feet x 576 feet x 612 feet x 175 feet), will be located at the Horizon Ridge PLS on BLM-administered land, and will be located within the 150-foot-wide temporary workspace.

Five existing TUP/temporary easement access roads, shown on **Figure 4; Appendix E**, have been identified for construction of Phase II. Two of the TUP/temporary easement access roads are located on portions of BLM-administered land. Roads that would require upgrade are noted as such below. All other roads would not require upgrade for construction.

- TUP/Temporary Easement Access Road 10/Eldorado Valley Drive (Project milepost 56.2): Existing paved road. The road is approximately 18 feet wide and the proposed use of the road is approximately 7,380 feet long.
- TUP/Temporary Easement Access Road 11 (Project milepost 58.7): Existing unnamed road with a paved surface, located on Boulder City land. The road is approximately 18 feet wide and the proposed use of the road is approximately 15,754 feet long.
- TUP/Temporary Easement Access Road 12 (Project milepost 61.0): Existing unnamed road with a soil surface, located on Boulder City land and private land. The road is approximately 18 feet wide and the proposed use of the road is approximately 25,335 feet long.
- TUP/Temporary Easement Access Road 13 (Project milepost 66.3): Existing unnamed road with a soil surface, located on BLM-administered land and private land. This road may need to be upgraded to accommodate construction vehicles. The road is approximately 18 feet wide and the proposed use of the road is approximately 19,429 feet long, with 9,778 feet on BLM-administered land (4.04 acres).
- TUP/Temporary Easement Access Road 14/Horizon Ridge Parkway (Project milepost 69.5): This paved road will be used to access the Project construction ROW. There is a portion of road, located on BLM-administered land, that is soil surface between the end of Horizon Ridge Parkway and the Project construction ROW. The road is approximately 18 feet wide and the proposed use of the road is approximately 340 feet long, all on BLM-administered land (0.14 acre).

The TUP/temporary easement access roads described above are the main access roads that would be used during construction of Phase II; however, TUP/temporary easement access roads identified in Phases I and III could also be used during construction of Phase II.

During operations, Access Road 14/Horizon Ridge Parkway, Access Road 10/Eldorado Valley Drive, and Access Road 17/Christmas Tree Pass Road would be used for access. These are the roads that SWG currently uses for operations as well.

2.2.3 Phase III: Intersection Point Station to Searchlight Crossover

Phase III of construction begins at the existing Intersection Point Station, east of Needles Highway (at Project milepost 0.0), and ends south of Searchlight, at the Searchlight Crossover (at Project milepost 29.0) for a total of approximately 29.0 miles (**Figure 5; Appendix E**). This phase crosses 2.81 miles of Clark County land, 25.93 miles of BLM-administered land, and 0.15 mile of NDOT ROW.

Phase III of construction would replace the existing 720 psig pipeline with a new 24-inch-diameter pipeline that would also operate at 720 psig. The new pipeline would be installed within the existing BLM grant. No new permanent ROW is needed. The width of the existing permanent ROW varies from 75 feet to 200 feet and is within portions of what has already been disturbed from the installation of the existing pipelines and the adjacent operations and maintenance road. Acreages of Project area ground disturbance, where vegetation may be removed, are shown in **Table 1; Section 1.1**.

TUP/temporary easement pipeline workspace would be needed along the permanent ROW to facilitate safe construction and would be used for workspace, staging equipment, storing spoils, and providing a lane(s) of construction traffic. When fencing is encountered, the TUP/temporary easement pipeline workspace would be reduced to match the fence line.

Eleven TUP/temporary easement staging areas are also planned for this phase, seven of which would be located on BLM-administered land that occupies 13.32 acres. Widths of the TUP/temporary easement staging areas vary. The proposed TUP/temporary easement staging areas are described below and shown on **Figure 5; Appendix E**.

- TUP/Temporary Easement Staging Area 13 (Project milepost 0.0): A staging area, 1.09 acres (502 feet x 103 feet x 434 feet 134 feet), will be located east of Needles Highway at Intersection Point Station on Clark County land.
- TUP/Temporary Easement Staging Area 14 (Project milepost 0.1): A staging area, 4.64 acres (333 feet x 985 feet x 180 feet x 1,261 feet), will be located west of Needles Highway on Clark County land.
- TUP/Temporary Easement Staging Area 15 (Project milepost 2.5): A staging area, 1.82 acres (200 feet x 400 feet x 200 feet x 395 feet), will be located on Clark County land.
- TUP/Temporary Easement Staging Area 16 (Project milepost 4.8): A staging area, 1.84 acres (200 feet x 400 feet x 200 feet x 400 feet), will be located on BLM-administered land.
- TUP/Temporary Easement Staging Area 17 (Project milepost 7.7): A staging area, 1.65 acres (180 feet x 400 feet x 180 feet x 400 feet), will be located on BLM-administered land.
- TUP/Temporary Easement Staging Area 18 (Project milepost 10.1): A staging area, 1.38

acres (150 feet x 400 feet x 150 feet x 400 feet), will be located on BLM-administered land next to SWG's Davis Dam Compressor Station.

- TUP/Temporary Easement Staging Area 19 (Project milepost 11.2): A staging area, 2.62 acres (201 feet x 150 feet x 51 feet x 490 feet x 206 feet x 781 feet), will be located on BLM-administered land next to SWG's Davis Dam Crossover and adjacent to Highway 163.
- TUP/Temporary Easement Staging Area 20 (Project milepost 18.2): A staging area, 2.15 acres (209 feet x 500 feet x 200 feet x 438 feet), will be located on BLM-administered land adjacent to Christmas Tree Pass Road.
- TUP/Temporary Easement Staging Area 21 (Project milepost 21.4): A staging area, 1.98 acres (200 feet x 400 feet x 210 feet x 464 feet), will be located on BLM-administered land adjacent to Loran Station Road.
- TUP/Temporary Easement Staging Area 22 (Project milepost 26.7): A staging area, 1.70 acres (150 feet x 400 feet x 150 feet x 400 feet), will be located on BLM-administered land.
- TUP/Temporary Easement Staging Area 1 (Project milepost 29.6): A staging area, 3.13 acres (200 feet x 809 feet x 324 feet x 554 feet), will be located on the east side of U.S. Highway 95.

Eight existing TUP/temporary easement access roads, shown on **Figure 5; Appendix E**, have been identified for construction of Phase III. All, or portions, of five of these would be located on BLM-administered land. Roads that would require upgrade are noted as such below. All other roads would not require upgrade for construction.

- TUP/Temporary Easement Access Road 15 (Project milepost 0.1): Existing unnamed road with a soil surface, located on Clark County land and within NDOT ROW. The road will not need to be upgraded for construction. The road is approximately 18 feet wide and the proposed use of the road is approximately 102 feet long.
- TUP/Temporary Easement Access Road 16a/b (Project milepost 11.2): Existing unnamed road with a soil surface, located within NDOT ROW, that connects to Highway 163 (access point north and south of highway). The road will not need to be upgraded for construction. Access road 16a is approximately 24 feet wide and the proposed use of the road is approximately 140 feet long. Access road 16b is approximately 18 feet wide and the proposed use of the road is approximately 108 feet long.
- TUP/Temporary Easement Access Road 17/Christmas Tree Pass Road (Project milepost 18.2): Located on BLM-administered land, existing road that will not need to be upgraded for construction. The road is approximately 18 feet wide and the proposed use of the road is approximately 10,519 feet long with 10,352 feet on BLM-administered land (4.28 acres).
- TUP/Temporary Easement Access Road 18/Loran Station Road (Project milepost 21.3): Located on BLM-administered land, existing road that will not need to be upgraded for construction. The road is approximately 18 feet wide and the proposed use of the road is approximately 7,662 feet long with 7,500 feet on BLM-administered land (3.10 acres).
- TUP/Temporary Easement Access Road 19 (Project milepost 24.2): Existing unnamed road with a soil surface located on BLM-administered land. This segment of road may need to be upgraded to accommodate construction vehicles. The road is approximately 18 feet wide and the proposed use of the road is approximately 5,022 feet long, with 4,957 feet on BLM-

administered land (2.04 acres).

- TUP/Temporary Easement Access Road 20/Golden Rod Snyder Road (Project milepost 26.6): Existing road with a soil surface located on BLM-administered land. This segment of road may need to be upgraded to accommodate construction vehicles. The road is approximately 18 feet wide and the proposed use of the road is approximately 2,944 feet long, with 2,816 feet on BLM-administered land (1.17 acres).
- TUP/Temporary Easement Access Road 21/Power Line Road from Project milepost 11.4 to 27.9: Located on BLM-administered land, runs parallel to the construction ROW, and will also be used as an access road. The road will not need to be upgraded for construction. The road is approximately 18 feet wide and the proposed use of the road is approximately 84,900 feet long (35.08 acres).
- TUP/Temporary Easement Access Road 1/Tip Top Well Road (Project milepost 29.1): Existing road with soil surface that will not need to be upgraded for construction. The road is approximately 18 feet wide and the proposed use of the road is approximately 1,007 feet long with approximately 834 feet located on BLM-administered land (0.34 acre).

The TUP/Temporary easement access roads described above are the main access roads that would be used during construction of Phase III; however, TUP/temporary easement access roads identified in Phases I and II could also be used during construction of Phase III.

During operations, Access Road 14/Horizon Ridge Parkway, Access Road 10/Eldorado Valley Drive, and Access Road 17/Christmas Tree Pass Road would be used for access. These are the roads that SWG currently uses for operations as well.

For each phase of construction, SWG and its contractors would use backhoes, trenchers, welding trucks, water trucks, side-booms, flat-bed semi-trucks, lowboy trucks, work trucks, and hoe rams. The work force would include 12 to 15 people per spread, and the number of spreads would be determined by the construction contractor. **Appendix B** describes the construction, operations, and maintenance of the proposed facilities.

2.2.4 Construction of the Facilities

SWG would design, construct, operate, and maintain the proposed facilities in accordance with the U.S. Department of Transportation (USDOT) regulations at Title 49 CFR Part 192 "Transportation of Natural Gas and Other Gas by Pipeline; Minimum Federal Safety Standards" and other applicable federal, state, and local regulations. The standards imposed are in accordance with the Natural Gas Pipeline Safety Act of 1968, as amended. **Appendix B** describes the construction, operations, and maintenance of the proposed facilities.

2.2.5 Design Features and Applicant Proposed Mitigation

Design Features typically address specific environmental policies, planning guidelines, or regulatory requirements. They are intended to reduce or eliminate effects of the Proposed Action, whether or not the effects are significant in nature. Design Features are applied, where applicable, to the Project as a whole, and are provided in **Appendix C**.

2.3 Alternatives Considered but Dismissed from Further Analysis

An alternative pipeline alignment on the eastern side of Searchlight was considered for analysis but eliminated from detailed study due to the alignment running within Searchlight and in proximity to population and buildings (**Figure 6; Appendix E**). The preferred alternative west of Searchlight is located in a less populated area and reduces the regulatory compliance requirements imposed on the pipeline.

Chapter 3 Affected Environment and Environmental Effects

This chapter describes the existing conditions and describes the potential direct, indirect, and cumulative impacts of the Proposed Action and the No Action Alternative described in **Chapter 2**. The Cumulative Effects Area (CEA) would vary among the resources considered and would be defined for each resource. In general, the broad area considered extends from Henderson and Boulder City south through the Searchlight area to the west side of the Colorado River south of Laughlin and across the Colorado River from Bullhead City, Arizona. The geographic areas included are:

- The McCullough Range
- The Eldorado Valley
- The Eldorado Mountains, west side
- The Highland Range
- The Piute Valley
- The Newberry Mountains, west and south sides
- The Piute Range
- The Mohave Valley, west edge

Projects are grouped as past, present, or reasonably foreseeable future actions (RFFAs). The projects included are generally large or extensive projects that, taken together, result in cumulative impacts to the respective CEAs. Small projects with minimal or only short-term impacts (such as off-road races, recreational trails, well improvements, bridges, fences, or fiber optic lines) are not considered as contributing to cumulative impacts. **Table 5; Appendix A** summarizes nearby projects activities and impacts.

3.1 Resource Evaluation

The BLM Southern Nevada District Office (SNDO) resource specialists reviewed the Proposed Action and found the resources to be present with potential for impact, present with no potential for impact, or not present.

Table 2 is a list of all resources considered in the evaluation of the Proposed Action and alternative(s). The resources found that may be affected by this proposal have been carried forward for analysis and are discussed further in this chapter. The resources that are not present or found to not be impacted by the Proposed Action because they would be completely mitigated with the implementation of standard stipulations will not be discussed further.

Most resources carried forward for analysis are analyzed based on the total Project area which represents the total acres of land that would be used for the Project and includes existing permanent ROW, TUP/temporary easement workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads. Two exceptions are the Vegetation (**Section 3.6**) and Threatened Endangered or Sensitive Species (**Section 3.8**) resource sections.

Impacts to vegetation analyzed in **Section 3.6** use the Project area ground disturbance which consists of the portions of the Project area where vegetation would be removed and revegetated or

where existing conditions would change. The existing access roads (including the existing pipeline access road) where no new grading is anticipated are not included in the Project area ground disturbance calculation.

Similarly, impacts to the Federally listed endangered species Mojave desert tortoise (*Gopherus agassizii*) discussed in **Section 3.8** is analyzed using a reduced Project area based on a field review of the Project area. On November 7, 2019, representatives from SWG, Arcadis U.S., Inc. (Arcadis, SWG's contractor), and BLM resource specialists met along the northern portion of the Project area to review the existing disturbance within SWG's permanent ROW and determine how disturbance should be accounted for in the description and calculation of the Project disturbance impacts. During the site visit, the group discussed how the Project disturbance should be analyzed and described in the Project NEPA analysis and Endangered Species Act (ESA) consultation. Discussions focused on two categories of habitat: previously disturbed (e.g., SWG's permanent ROW, which was disturbed more than 50 years ago for the installation of the existing pipelines) and undisturbed (e.g., areas of new disturbance). It was apparent during the site visit that portions of SWG's existing permanent ROW had recovered since the initial disturbance associated with the installation of the existing pipelines. As such, it was determined that these recovered areas would be classified as functional desert tortoise habitat. Therefore, this EA analyzes impacts to desert tortoise habitat based on the functional desert tortoise habitat that would be impacted by the construction of the Project (Arcadis 2020b).

Table 2 Resources Considered in the Evaluation of the Proposed Action

Resource	May be Impacted (carry forward for analysis)	Present and Not Impacted or Not Present	Rationale for Not Impacted	Digital Signature and Date
ACECs	X		Carried forward for analysis (3.10 Land Use and Access).	Kevin Bryan 10/16/2020
Air Quality	X		Carried forward for analysis (3.3 Air Resources, Climate, and Noise).	Lisa Christianson 9/04/2020
Conservation Lands		X	Resource not present.	Lee Kirk 10/16/2020
Cultural Resources		X	The proposed actions will have No Adverse Effect based on the results of the cultural inventory (5-2803) completed for this Project. BLM determination of all 22 new cultural sites is National Register of Historic Places (NRHP) ineligible, including the SWG pipelines. The SWG L- and R-pipelines fall under the 2002 Advisory Council on Historic Preservation (ACHP) Section 106 Exemption Regarding Effects to Historic Natural Gas Pipelines (Federal Register Vol. 67 No. 66, April 5, 2002) that "releases all Federal agencies from the Section 106 requirement of having to consider the effects of their undertakings on historic natural gas pipelines," which are defined as "natural gas pipelines that meet the criteria for listing on the National Register of Historic Places." A National Archives and Records Administration (NARA) Report accompanies the cultural resources report that documents the SWG pipelines to meet the exemption standards. A total of 23 previously recorded sources were identified in the literature search, but only seven located and updated. Three were originally recommended as eligible, but BLM determines that these sites do not fit the NHRP eligibility criteria based on the survey results. The BLM determines that six of the previously identified sites are NHRP ineligible and the Boulder Dam-San Bernardino Transmission Line that crosses into the project area is a non-contributing segment to the overall NHRP eligibility of the line. The Old Spanish National Historic Trail is previously identified as crossing the project at four points, but there was no material evidence of the trail during the survey. The BLM invited the Old Spanish National Historic Trail administrators (National Park Service and BLM co-administers of the trail) to participate in the Section 106 process as a consulting agency on 6/9/20 and 7/6/20. In addition, public outreach to the Old Spanish Trail Association was completed on 10/7/20. Neither the agency or the association expressed interest in further consultation or offered comments.	Kathrina Aben 10/23/2020

Table 2 Resources Considered in the Evaluation of the Proposed Action

Resource	May be Impacted (carry forward for analysis)	Present and Not Impacted or Not Present	Rationale for Not Impacted	Digital Signature and Date
Environmental Justice and Socioeconomics		X	The Proposed Action would not adversely or disproportionally impact minority populations, low-income communities, or Tribes. The Proposed Action would not have a disproportionately high or adverse effect that would place socioeconomic burdens on the citizens of Clark County and nearby cities due to the limited context and intensity of the proposal. No group of people, including racial, ethnic, or socioeconomic groups, would bear a disproportionate share of the negative environmental consequences resulting from the Proposed Action.	Lee Kirk 10/16/2020
Fish and Wildlife Excluding Federally Listed Species	X		Carried forward for analysis (3.7 Terrestrial Wildlife).	Kevin Bryan 10/16/2020
Floodplains	X		Carried forward for analysis (3.4 Water Resources).	Boris Poff 9/14/2020
Forestry	X		Cacti and yucca are considered forestry products. These species will be carried forward for analysis under the Section 3.6 Vegetation.	Lara Kobelt 2/9/2021
Fuels and Fire Management		X	The pipeline crossing land managed by the BLM LVFO would be located within areas of previous disturbance and co-located along existing pipeline corridors and roads, where feasible. During initial construction, SWG would grade the ROW. Thus, the ROW should be clear of vegetation during construction to reduce the availability of fuels and fire risk. Additionally, SWG would regularly use water as dust control in areas where construction is underway. During construction, operation, and maintenance, each construction crew would have at least one fire extinguisher available at all times. Additional fire controls would be used in association with welding. SWG would follow all required state and local guidance for fire prevention. Construction and operations and maintenance activities will comply with standard stipulations and compliance measures. Infrastructure that could be threatened by wildfire will be managed to reduce wildfire risk. During fire restrictions, specific non-compliant activities may be permitted in writing on a case by case basis by a line officer after review and approval by the Fire Management Officer (43 CFR 9212). See standard stipulations and mitigation measures for more information.	Sean McEldery 11/13/2020
Geology/Mineral Resources	X		Carried forward for analysis (3.2 Geology, Minerals, and Paleontology).	Jeremiah Wagener 10/16/2020
Green House Gas/ Climate Change		X	Currently there are no emission limits for suspected Greenhouse Gas (GHG) emissions, and no technically defensible methodology for predicting potential climate changes from GHG	Lisa Christianson 09/04/2020

Table 2 Resources Considered in the Evaluation of the Proposed Action

Resource	May be Impacted (carry forward for analysis)	Present and Not Impacted or Not Present	Rationale for Not Impacted	Digital Signature and Date
			emission. However, there are, and will continue to be, several efforts to address GHG emissions from federal activities, including BLM authorized uses.	
Hydrologic Conditions	X		Carried forward for analysis (3.4 Water Resources).	Boris Poff 9/14/2020
Invasive Species/ Noxious Weeds	X		Carried forward for analysis (3.6 Vegetation).	Sean McEldery 11/13/2020
Lands and Realty	X		Carried forward for analysis (3.10 Land Use and Access).	Eric Benavides 2/14/2021
Livestock Grazing		X	The land within the Project area does not currently support livestock grazing.	Lara Kobelt 9/2/2020
Migratory Birds	X		Carried forward for analysis (3.7 Terrestrial Wildlife).	Kevin Bryan 10/16/2020
Native American Concerns		X	Tribal consultation letters were mailed from the BLM on 10/5/20 to the Fort Mojave Indian Tribe, the Las Vegas Tribe of Paiute Indians, the Moapa Band of Paiute Indians, Twenty-Nine Palms Band of Mission Indians, Colorado River Indian Tribes (CRIT) and the Chemehuevi Indian Tribe. The letter was followed by e-mails from the BLM on 10/15/20 and 11/16/20. On 11/18/20 and 11/20/20 the Fort Mojave and the Colorado River Indian Tribes (CRIT) respectively contacted the BLM to express tribal interest in the Project and requested having a tribal monitor present for the Project and asked to review the cultural resource report. BLM followed up with Fort Mojave by phone and e-mail on December 29, 2020, as well as a January 8, 11, 19, 22, 25, and February 9, 2021 for a formal response with comments. BLM has not received a formal response. SWG would follow all measures deemed necessary to avoid and minimize impacts to Tribal resources.	Kathrina Aben 2/9/2021
Paleontological Resources		X	The propose activity falls within Class 1 and Class 2 of the BLM Potential Fossil Yield Classification GIS map. The paleontological resources for Class 1and Class 2 geological units are generally low and further assessment is usually unnecessary except in occasional or isolated circumstances. Please include standard stipulations.	Mary Ellis 8/11/2020
Recreation/Travel/ Wild and Scenic Rivers	X		Carried forward for analysis (3.10 Land Use and Access).	Kenny Kendrick 2/14/2021
Soils	X		Carried forward for analysis (3.5 Soils).	Boris Poff 2/12/2021
Threatened Endangered or Candidate Animal Species	X		Carried forward for analysis (3.8 Threatened, Endangered, or Sensitive Species). This Project will require Section 7 consultation with U.S. Fish and Wildlife Service (USFWS)	Kevin Bryan 10/22/2020

Table 2 Resources Considered in the Evaluation of the Proposed Action

Resource	May be Impacted (carry forward for analysis)	Present and Not Impacted or Not Present	Rationale for Not Impacted	Digital Signature and Date
			for the threatened Mojave desert tortoise. The consultation is pending and this section will be updated once the append process is complete.	
Threatened Endangered or Candidate Plant Species	X		There are no threatened and endangered plants within or near the Project area. Sensitive plant species are analyzed under Section 3.8 (Threatened, Endangered, or Sensitive Species).	Lara Kobelt 9/2/2020
Transmission Corridors		X	The Project will cross or be located within the following corridors: • WEC 39-231 West Wide Energy Corridor/Rainbow Gardens – Eldorado RMP/Legislative Designated Corridor • Boulder – McCullough Pass Legislative Corridor • Boulder – Primm South Legislative Corridor • WEC 47-231 West Wide Energy Corridor/Aztec RMP Designated Corridor • Boulder City – Searchlight RMP Designated Corridor • Searchlight – Laughlin RMP Designated Corridor • Fort Mohave RMP Designated Corridor • West Wide Energy Corridor 39-231 & 47-231 Consistent with Section 368 Section 368(a) of the 2005 Energy Policy Act (Public Law 109-58), and the 2009 Record of Decision for the West-wide Energy Corridor Programmatic Environmental Impact Statement and the 2012 settlement agreement, BLM established 5,000 miles of energy corridors throughout the Western United States for potential placement of future oil, gas, and hydrogen pipelines and electricity transmission and distribution infrastructure. West-wide energy corridors are considered preferred locations for energy transport projects on lands managed by the BLM and are intended to facilitate long-distance transport of oil, gas, or hydrogen via pipelines and transmission and distribution of high-voltage electricity via transmission and distribution lines. **Transmission Corridors (does not apply to privately owned surface)** • The applicant/proponent would be required to comply with applicable federal, state, and local laws and regulations for development, construction, operations, maintenance, decommissioning, restoration, and/or termination of actions. • Co-location and/or alternate routes may be required. • Interagency Operating Procedures (IOPs) identified in the Record of Decision for the West-wide Energy Corridor Programmatic Environmental Impact Statement would apply for future actions.	Lisa Moody 10/5/2020
Vegetation	X		Carried forward for analysis (3.6 Vegetation).	Lara Kobelt 2/9/2021

Table 2 Resources Considered in the Evaluation of the Proposed Action

Resource	May be Impacted (carry forward for analysis)	Present and Not Impacted or Not Present	Rationale for Not Impacted	Digital Signature and Date
Visual Resources	X		Carried forward for analysis (3.9 Visual Resources).	Steve Leslie 10/22/2020
Wastes (hazardous or solid)			Not present, however, do include standard stipulations into the final grant document(s).	Lisa Chrsitianson 9/04/2020
Water Resources	X		Carried forward for analysis (3.4 Water Resources).	Boris Poff 9/14/2020
Wetlands and Riparian Areas	X		Carried forward for analysis (3.4 Water Resources).	Boris Poff 9/14/2020
Wild Horse and Burros		X	The Proposed Action is not located within a herd management area and will not directly impact wild horse or burro populations.	Tabitha Romero 8/12/2020
Wilderness		X	No designated Wilderness Areas, Wilderness Study Areas (WSAs), or lands with wilderness characteristics (LWC) are present in the Project area. There are no Wilderness Areas within 50 miles of the Project area. The nearest WSA is approximately 52 miles from the northern tip of the proposed alignment. The nearest LWC (NV-050-0436) is located west of Searchlight, approximately 813 feet from the proposed alignment. Therefore, there will be no impacts to the wilderness character or wilderness characteristics from the Proposed Action.	Braydon Gaard 10/16/2020

3.2 Geology, Minerals, and Paleontology

3.2.1 Affected Environment

3.2.1.1. Existing Geologic Setting

The Project is located within the Basin and Range Province in Clark County, southern Nevada. Geologic units within the Project area are Miocene to early Pliocene aged bedrock overlain by Miocene and Quaternary age alluvial deposits. The Project originates near Henderson, Nevada and travels south through six hill and valley areas, terminating in the Colorado River Plain west of Bullhead City, Arizona (Error! Reference source not found. **Appendix E** and Error! Reference so urce not found. **Appendix E**). The region is characterized by abrupt topographic change containing narrow, faulted mountain chains and flat arid valleys between. These chains are a result of uplift during tectonic extension. Significant faulting can be found within the geology of these chains where bedrock is exposed.

Due to the scale of the Project and the absence of detailed geologic mapping in most Project areas, the descriptions below are general. They are based on the composite maps prepared by Crafford (2007). Generalized geologic maps are presented on **Figure 9; Appendix E** and **Figure 10; Appendix E**.

McCullough Range. The predominate rock type throughout the range is of Early Miocene to Early Pliocene aged basalt and andesite. Other rock types within the range include Late Eocene to Late Miocene tuffaceous sedimentary rocks, limestone, and sandstone (Crafford 2007).

Eldorado Valley. Surficial Quaternary aged alluvium has been mapped throughout the valley to a depth of 60 inches. Some minor areas of older Miocene to Quaternary aged alluvial deposits have been mapped in the southern limb of this area. All geologic units in this area are unconsolidated (Crafford 2007).

Searchlight Hills. Consolidated bedrock composed of Middle to Late Miocene aged andestite and latite are mapped in the upland areas of this region. In areas of lower elevation, Miocene to Quaternary aged alluvium has been mapped to a depth of 60 inches and contains areas of cementing at depths of 22 to 60 inches (Crafford 2007).

Piute Valley. Unconsolidated Quaternary aged alluvium has been mapped as the predominate rock type in this region to a depth of 60 inches and contains areas of cementing at 22 to 60 inches (Crafford 2007).

Newberry Mountains. Consolidated Early to Middle Miocene age granite and alkali-granite has been mapped as the predominate unit in this region. This region also contains Middle Proterozoic age granite and Early Proterozoic age gneiss and schist close to the Project (Crafford 2007).

Colorado River Plain. Unconsolidated Quaternary age alluvial deposits are the primary units in this region, have been mapped to a depth of 60 inches, and contain no cementing (Crafford 2007).

3.2.1.2. Faults and Seismicity

Quaternary Faults

Numerous normal faults have been mapped in the exposed bedrock of the McCullough Range, Searchlight Hills, and Newberry Mountains near the Project (**Figure 11; Appendix E** and **Figure 12; Appendix E**). However, most of these faults are pre-Quaternary, and are therefore considered

inactive.

The exception is Black Hills Fault Zone (**Figure 13; Appendix E**), which includes Quaternary faults. The faults within this zone have a general northeast-southwest orientation. These faults range in age from 15,000 to 750,000 years, but none have shown activity in the past 150 years.

Seismicity

The risk of seismic ground motions is highest at the northern terminus of the Project and steadily decreases to the south. The peak ground accelerations (PGAs) were estimated based on the 2014 National Seismic Hazard Map (USGS 2015) as follows:

- **Two percent chance of exceedance in 50 years.** This PGA corresponds to a recurrence interval of approximately 2,500 years. The maximum PGA is approximately 25 percent of standard gravity (g; or 0.25) at the northern Project terminus. The minimum PGA is approximately 0.11 g at the southern Project terminus.
- **Ten percent chance of exceedance in 50 years**. This PGA corresponds to a recurrence interval of approximately 475 years. The maximum PGA is approximately 0.085 g at the northern Project terminus. The minimum PGA is approximately 0.045 g at the southern Project terminus.

3.2.1.3. Existing Mineralogy Setting

Mineralogy and Elemental Distribution

The mineral assemblage of Clark County in the Project area is composed of minerals associated with source rock for the primarily alluvium-based landscape as well as associated minerals with bedrock outcrop. Some of the fractured bedrock outcrop also contain fracture fill of fibrous amphiboles such as actinolite (Buck et al. 2013). Except for the Tenwell series soil, all soils in the area are slightly to strongly alkaline, indicating that the mineral composition is alkaline-rich rocks and minerals such as silicon and sodium. There are no historical or current mineral exploration sites within the vicinity of the Project area.

Soils in the area support current sand and gravel quarries and have potential for much more extensive exploitation. Mineral materials within the Project area are public property administered by the BLM under the regulations at 43 CFR 3600 (Mineral Materials Disposal) and the Federal Aid to Highway Act. Mineral materials are authorized for disposal by the Las Vegas RMP and Final EIS (October 1998). The regulations at 43 CFR 3600 establish procedures for the exploration, development, and disposal of mineral material resources on public lands, and for the protection of the resources and the environment. The regulations apply to free-use permits and contracts for sale of mineral materials. The sale, free-use, or issuance of a material site ROW must conform with the RMP Minerals Management Section (Code MN), the Federal Aid to Highway Act, and the regulations at 43 CFR 3600. Any mineral materials extracted, severed, or removed from public lands without a contract, free-use permit, or material site ROW constitutes unauthorized use. Unauthorized users are liable for damages to the United States and are subject to prosecution for such unlawful acts.

Regional Natural Occurring Asbestos

The Project area has been identified in an area of naturally occurring asbestos (NOA). Asbestos is a mineral that occurs in locations throughout the U.S. and Canada. Persons disturbing NOA can be exposed to asbestos. Based upon available NOA studies performed in southern Nevada

(Buck et al. 2013), there is potential for NOA in native rock and associated erosional sediments throughout the entire Project area.

Arcadis, on behalf of SWG, performed an Occupational Safety and Health Administration (OSHA) NOA Exposure Assessment in preparation for on-site field assessment in the Project area (Arcadis 2017, 2018e). Activity-based Sampling (ABS) was conducted to assess workers' potential exposure to airborne asbestos during planned field survey activities (e.g., driving, driving following a grader, shoveling, walking, working near trenching) in the Project corridor. The ABS consisted of collecting air samples from a worker's breathing zone while performing specific defined field survey work activities and comparing them to the OSHA Permissible Exposure Limits (PELs). The exposures assessed during the ABS were below the OSHA PEL for asbestos, and a Negative Exposure Assessment (NEA) was established for the activities included in the ABS.

3.2.1.4. Existing Paleontology Setting

The Potential Fossil Yield Classification (PFYC) allows the BLM to predict the likelihood of a geologic unit to contain paleontological resources. The PFYC is based on a numeric system of 1 through 5, with PFYC 1 having little likelihood of containing paleontological resources, whereas PFYC 5 is a geologic unit known to contain abundant scientifically significant paleontological resources. The fossil resources of concern in this area are the remains of vertebrates, which include species of fish, amphibians, and mammals.

The Project would cross through the southern Las Vegas Valley, the McCullough Range, the Eldorado Valley, the Highland Range, the Piute Valley, the Newberry Range, and the Mojave Valley. The geology of these areas consists predominantly of late Neogene igneous bedrock and Quaternary alluvium. BLM (2016) lists the PFYCs as:

1. **Very Low.** These units are typically igneous or metamorphic and/or Precambrian in age.
2. **Low.** Field surveys have verified that paleontological resources are not present or very rare. These units are typically less than 10,000 years old or recent eolian deposits. They may also include sediments that have undergone significant physical and chemical changes that make fossil preservation unlikely.
3. **Moderate.** Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Paleontological resources may be intermittent or widely scattered.
4. **High.** Geologic units known to contain a high occurrence of paleontological resources. Significant paleontological resources have been documented but may vary in occurrence and predictability.
5. **Very High.** Highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources.

Most, if not all, of the Project area, includes a PFYC of 1 to 3 (BLM 2016).

3.2.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, there would be no direct or indirect impacts related to geology, mineralogy, or paleontology from the Project.

3.2.3 Environmental Effects of the Proposed Action

3.2.3.1. Geologic Hazards

SWG conducted a fault investigation study to investigate the younger fault strand of the Black Hills Fault Zone and determine if it crosses the Project alignment on Boulder City land. During the investigation, three parallel trenches were excavated in an attempt to expose the Black Hills fault, if present, crossing the permanent ROW. No fault-related offset or deformation of exposed soils was documented within these trenches. During the investigation, the trenches were not excavated deeper than 5 feet. It is possible that recent surface rupture has occurred in the trench locations deeper than 5 feet (InfraTerra 2019).

Liquefiable soils were not found within the Project area; therefore, earthquake-induced liquefaction is not a concern for the Project.

3.2.3.2. Minerals

The Proposed Action has the potential to produce excess mineral materials. These mineral materials would need to be used within the ROW or stockpiled within the ROW for future use at this or another location. If mineral materials are to be stockpiled within the ROW for future use, they must be obtained in accordance with the regulations at 43 CFR 3600 or under the Federal Aid to Highways Act in the form of a contract, free-use permit, or material site ROW before they can be removed from the ROW.

If a contract, free-use permit, or material site ROW is necessary for the export of excess mineral materials, the BLM would issue the required contract, free-use permit, or material site ROW so long as it falls within the analyzed area.

3.2.3.3. Naturally Occurring Asbestos

The exposures assessed during the ABS were below the OSHA PEL for asbestos, and an NEA was established for the activities included in the ABS (Arcadis 2017, 2018e). Before construction, SWG would review the ABS and determine if additional samples are needed to target construction activities.

3.2.3.4. Paleontology

Based on interpretation of the geologic deposits shown on the generalized Geologic Map of Nevada (Stewart and Carlson 1978), all phases of the Project pass through late Neogene igneous bedrock or unconsolidated late Neogene to Quaternary alluvium. All of these deposits have a very low to moderate potential (PFYC 1 to 3) for containing significant paleontological resources. The mountainous areas (McCullough Range, Highland Range, and Newberry Mountains) consist of various Neogene volcanic deposits, including flows, breccias, and ash falls, as well as Neogene intrusive rocks including diorites and granites. These areas have a very low potential (PFYC 1). The Eldorado and Piute Valley floor areas are dominated by Quaternary alluvium with some pockets of older alluvium. There are no published discoveries that would indicate a potential for important paleontological materials, but little systematic survey has been conducted in this area; the potential for significant fossils is unknown.

3.2.4 Cumulative Impacts of the Proposed Action

Geological resources vary according to the geological formations within which they occur; therefore, the impacts of the Proposed Action to geological hazards and resources would be

localized within the immediate ROW corridor. Incremental impacts to geological resources and from geologic hazards from other past, present, or reasonably foreseeable projects when combined with the Proposed Action are anticipated to be low.

3.2.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.2.6 Residual Impacts

Residual impacts are contingent on the adherence to best management practices (BMPs) and mitigation measures to minimize impacts to geological, mineralogical, and paleontological resources.

3.3 Air Resources, Climate, and Noise

3.3.1 Affected Environment

3.3.1.1. Air Resources

Existing Air Emissions

Existing air emissions for Clark County, Nevada are summarized in **Table 6; Appendix A**. Data were taken from the 2014 National Emissions Inventory (NEI) database for Tier 1 (Criteria Pollutants) in Clark County, Nevada.

National Ambient Air Quality Standards

The U.S. Environmental Protection Agency (USEPA) has promulgated National Ambient Air Quality Standards (NAAQS) for specific regulated air pollutants to protect human health and welfare. The NAAQS include primary standards designed to protect human health including the health of sensitive subpopulations such as children, the elderly, and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare including economic interests, visibility, vegetation, animal species, and other concerns not related to human health.

Each primary and secondary NAAQS is expressed in terms of a concentration level and an associated averaging period. The states are required to implement and enforce the NAAQS through State Implementation Plans (SIPs), which must be approved by the USEPA. The State of Nevada's SIP is managed by the Nevada Department of Environmental Protection (NDEP), Bureau of Air Quality Planning (BAQP). Generally, the SIPs are composed of air quality rules applicable to stationary sources that may emit criteria air pollutants and/or hazardous air pollutants (HAPs).

Under the provisions of the Clean Air Act (CAA), any state can have requirements more stringent than those of the national program and that are not addressed nationally. The national requirements still must be met, but the state's more stringent requirements must also be met. The current NAAQS for the criteria pollutants are summarized, along with additional Nevada standards, in **Table 7;** Error! Reference source not found.**Appendix A**.

Existing Ambient Air Quality and Attainment Status

An Air Quality Control Region (AQCR), as defined in Section 107 of the CAA, is a federally designated area where federal ambient air quality standards must be met. An implementation

plan, describing how ambient air quality standards would be achieved and maintained, is developed for each AQCR. Clark County, Nevada, where the Project is located, is part of the Las Vegas Intrastate AQCR.

According to the NDEP BAQP, the Nevada Air Pollution Control Program (NAPCP) operates an ambient monitoring network in nine Nevada locations. Washoe and Clark Counties operate and maintain monitoring networks separate from the state and publish their findings independently. The number of monitoring sites in Clark County varies from year to year.

The active air monitors in the general proximity of the Project area are located at Boulder City (particulate matter less than 10 microns in size [PM_{10}] and ozone [O_3]), approximately 25 miles southeast of Las Vegas; Green Valley (PM_{10}, particulate matter less than 2.5 microns in size [$PM_{2.5}$], and O_3), located in Henderson; and Jean (PM_{10}, O_3, and $PM_{2.5}$), located approximately 30 miles south of Las Vegas. The monitoring stations are in developed areas (Clark County 2017).

The Project area has also been identified in an area of NOA (refer to **Section 3.2**). Asbestos is a mineral that occurs in locations throughout the U.S. and can result in asbestos exposure for persons disturbing NOA. Based on available NOA studies performed in southern Nevada (Buck et al. 2013), the potential for NOA in native rock and associated erosional sediments is present throughout the entire Project area.

Applicable Laws, Regulations, Plans, and Standards

There are other federal air quality standards in addition to the NAAQS. These other standards are contained in 40 CFR Parts 50 through 99. In addition, Nevada has issued air quality regulations controlling air pollution in Nevada Administrative Code (NAC) Chapter 445B. The following sections briefly discuss requirements that potentially apply to the Project.

Fugitive Dust

SWG would comply with Clark County dust control requirements. A permit is required for soil-disturbing projects greater than or equal to 0.25 acre in Clark County. A permit is also required for trenching operations greater than or equal to 100 feet in length. Each Dust Control Permit application must have a Dust Mitigation Plan outlining control measures to prevent fugitive dust. A Supplement to the Dust Mitigation Plan is required for soil-disturbing or construction projects 10 acres or larger in size, trenching activities 1 mile or more in length, and structural demolition using implosive or explosive techniques. This required supplement details the Dust Mitigation Plan and includes the Project Description, Control Measures drawn from Construction Activities Best Management Practices, Site Plan, Soil Stabilization Measures, and Employee Dust Control Training and Compliance. Any construction project causing more than 50 acres of active disturbance to soil at any given time is required to operate under the oversight of a Dust Control Monitor (Clark County 2003).

State Minor Facility Permit Program and Stationary Source Air Quality Requirements

NAC 445B.187 defines “stationary source” to exclude temporary construction including, without limitation, the construction of emission units. When in operation, the Project would fall under the Standard Industrial Classification (SIC) Code No. 4922, Natural Gas Transmission. Because the operating Project belongs to this major industrial grouping in the SIC Manual, per NAC 445B.187, the facilities can be defined as a stationary source when in operation, and SWG would comply

with any operational air permitting requirements triggered by the Project. There are no other state regulations that apply to construction and new equipment.

State Mobile Source Air Quality Requirements
Requirements of Nevada's Heavy-Duty Diesel Emissions Control Program are specified in NAC 445B.589. The requirements apply to heavy-duty diesel vehicle engines and vehicles with a gross vehicle weight rating of 14,000 pounds. The requirements, which apply mostly to the vehicle manufacturers, apply to essentially all such vehicles that are brought into Nevada. This regulation adopts California exhaust emission standards and test procedures. Vehicles used during construction would comply with applicable requirements.

3.3.1.2. Noise

The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually composed of natural and manmade sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably during a day and throughout the week.

Clark County has a noise ordinance, but states that construction is exempt when operating during daytime hours. The City of Henderson has a general noise ordinance, but the ordinance does not apply to this Project. Bullhead City also has a general noise ordinance, but it does not apply to this Project. Searchlight does not have any established noise ordinance.

Existing noise levels vary, generally with population density. This Project would primarily take place in rural areas, but suburban areas near the Project are located south of Henderson, Nevada and west of Searchlight, Nevada. Residences are located in proximity to the north end of the Project at Horizon Ridge PLS. Noise at these residences is expected to be influenced by existing road networks and would generally be in the range of 40 A-weighted decibels (dBA) to 61 dBA, depending on how close a residence is to existing roads and time of day.

3.3.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, there would be no change to direct or indirect impacts related to air resources, climate, or noise from the Project. Existing maintenance operations would continue for the existing pipelines, which may result in temporary, minor impacts to air quality and noise.

3.3.3 Environmental Effects of the Proposed Action

3.3.3.1. Air Resources

Direct impacts of construction of the Proposed Action include temporary increases in particulate emissions from unpaved and paved roads, disturbed areas, and combustion-related construction.

Most air pollutants generated during construction would be fugitive dust (particulates, PM_{10}, and $PM_{2.5}$). Construction-related activities that have the potential for generating fugitive dust include, but are not limited to, soil disturbance, vegetation removal, clearing and grading, track-out onto roads, topsoil removal, cutting and filing, trenching, backfilling, bulk material loading, hauling, and unloading, movement of construction equipment on the construction site, and use of unpaved or paved roads.

3.3.3.2. Noise

Noise associated with conventional pipeline construction typically would occur only during daylight hours. During the construction phase, there would be four highway locations that would use horizontal directional drilling (HDD). The four identified HDD road crossings are at Needles Highway (Project milepost 0.05), Highway 163 crossing (Project milepost 11.1), U.S. Highway 95 (Project milepost 29.9), and Joshua Tree Highway (State Route 164; Project milepost 33.32). During construction, the Project is not expected to use blasting, piledriving, or dredging. There would be no noise or vibration impacts associated with the operation of the Project because there are no additional compression or metering stations proposed. Based on construction noise analyses conducted for other proposed pipeline projects (USEPA 1978), noise levels of 60 dBA or above could extend perpendicular to the centerline of the pipeline up to 1 mile from the source depending on surrounding conditions. These levels could occur sporadically during construction, and the zone of impact would be limited to the local area of construction as the construction chain moves along the ROW.

Phase I: Searchlight Crossover to Eldorado Tap

Phase I, at approximately Project milepost 33.4 and Project milepost 33.0, is adjacent to potential residential property. There are minimal noise sources established at these locations, currently estimated to be in the range of 40 dBA to 45 dBA during the day, when work would occur. These areas of Phase I are within 500 feet of the Project, and therefore would likely experience an increase in noise. The HDD operations would occur approximately 2,500 feet from the nearest potential residential location. Due to the distance, the HDD activity is not expected to have a noise impact on the residential location.

Phase II: Eldorado Tap to Horizon Ridge Pressure Limiting Station

The north end of Phase II, at approximately Project milepost 69.5, is adjacent to a residential neighborhood within the City of Henderson, Nevada. The established noise levels at this location (expected to be influenced by existing road networks) are anticipated to be in the range of 50 dBA to 55 dBA during the day, when work would occur. There is also a planned staging area at Project milepost 69.5; therefore, there could be increased noise associated with the staging area adjacent to the neighborhood.

Phase III: Intersection Point Station to Searchlight Crossover

Phase III, at approximately Project milepost 0.0, is adjacent to a residential property associated with Bullhead City, Arizona. The established noise levels at this location (expected to be influenced by existing road networks and water traffic) are anticipated to be in the range of 55 dBA to 61 dBA during the day, when work would occur. This area of Phase III is within 2,000 feet of the staging area at Project milepost 0.0, and therefore would experience a minimal increase in noise. The HDD operations at Needles Highway would occur approximately 2,000 feet from the nearest potential residential location (across the Colorado River). Due to the distance, the HDD activity is not expected to have a noise impact on the residential location. No noise sensitive areas were identified near the HDD at Highway 163.

The noise levels from the construction and existing road networks for all Phases would be below the Federal Transit Administration guidelines of 90 dBA for the daytime 1-hour L_{eq} (Equivalent Continuous Sound Level) in residential areas, and 100 dBA for the daytime 1-hour L_{eq} in commercial areas.

Operations and Maintenance
Continued operations and maintenance would result in similar, but negligible, increases in airborne dust, noise, and emissions as those discussed for Project construction. These impacts would be temporary.

3.3.4 Cumulative Impacts of the Proposed Action

The Proposed Action, in conjunction with other projects in the vicinity, would result in cumulative increases to fugitive dust, vehicle emissions, and noise. The severity of these impacts would be contingent on the use of BMPs and minimization techniques for each project. Particulate concentrations would be highest near the Project boundary and would decrease with distance; therefore, only projects close to the Proposed Action area would contribute to these cumulative effects.

3.3.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.3.5.1. Emissions

Nevada restricts visible emissions and idling for vehicles powered by gasoline or diesel fuel (specified in NAC 445B.576). Off-road and non-road vehicles are not subject to the Act. On-road vehicles used during construction (e.g., construction worker personal vehicles) would comply with applicable requirements.

3.3.5.2. Noise

To avoid disruptive noise, construction and operations would occur during daytime hours to the extent practicable.

3.3.6 Residual Impacts

Residual impacts are contingent on the adherence to BMPs and mitigation measures to minimize impacts to air resources, climate, and noise.

3.4 Water Resources

3.4.1 Affected Environment

3.4.1.1. Existing Surface Water Resources

The Project crosses the El Dorado and Piute Valleys. This area is West of the El Dorado Mountains and is characterized by an arid climate where most of the precipitation is from thunderstorms within the summer months (Rush and Huxel 1966). Average precipitation within the El Dorado and Piute Valleys is 6.5 and 7.8 inches, respectively (USGS 2005).

All streams within the Project area are classified as ephemeral or intermittent drainages, as they only carry water after snow or rain events (**Figure 14; Appendix E**). When the streams within the valleys flow, most of the water is absorbed by alluvial deposits present underneath valley slopes (Rush and Huxel 1966). Several drainages within the Project area flow into the Piute Wash. The drainages hydrologically connected to Piute Wash may be considered Waters of the U.S. (WOTUS), defined as all waters that are, were, or may be used in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. WOTUS generally include all interstate

waters as well as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds (see 40 CFR 232.3 for complete definition). The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into WOTUS under Section 404 of the Clean Water Act (CWA).

The Project crosses four unique watersheds. **Table 8; Appendix A** identifies the county and milepost location of each watershed crossed by the pipeline.

Floodplains

A review of online, publicly available Federal Emergency Management Agency (FEMA) floodplain maps revealed that most of the planned pipeline and associated ROWs are not located within the mapped 100-year floodplain (FEMA 2017). However, three segments of the pipeline (Project milepost 21.6-24, 28.6-30.4, 41.7-43.8) are located within the mapped FEMA floodplain (**Figure 15; Appendix E**). Development within floodplains is regulated under the National Flood Insurance Program of 1968, which sets national standards for regulating new development in floodplains and distributes responsibility for floodplain management to all levels of government and the private sector. As a result, many state and local government agencies have enacted regulations to manage development within floodplains.

The Clark County Regional Flood Control District (CCRFCD) was created in 1985 and is responsible for developing and implementing a comprehensive flood control masterplan to solve flooding problems, regulating land use within flood zone areas, and coordinating construction and operation of flood control facilities within Clark County (CCRFCD 2020).

Wetlands

Section 404 of the CWA (33 U.S.C §1344) prohibits discharges of dredge or fill material into W OTUS, including jurisdictional wetlands, without a Department of the Army Permit. Section 404 of the CWA is administered by the USACE with oversight by the USEPA.

A review of the online, publicly available USFWS National Wetland Inventory (NWI) identified riverine systems throughout the Project area; the Project area, including the locations of NWI-mapped riverine systems, was evaluated for the presence of wetlands (Arcadis 2018d). SWG evaluated the Project area for wetlands using the 1987 USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (USACE 2010). No wetlands were identified in the Project area (Arcadis 2018d).

3.4.1.2. Baseline Surface Monitoring Network, Applicable Water Quality Standards, and Description of Waterbodies

Section 303(d) of the CWA requires all states to develop a list of waterbodies that do not support their designated uses or meet their state water quality standards. The USEPA Water Quality Planning and Management Regulations (40 CFR Part 130) requires states to set total maximum daily loads (TMDLs) for all waters identified as not meeting their designated uses. The Project does not cross any 303(d) listed impaired waters.

Water quality regulations require states to specify appropriate water uses to be achieved and protected. The NDEP designates the beneficial uses of state waters. In the State of Nevada, streams are identified for their beneficial uses. NAC 445A.1239 (often referred to as the

"Tributary Rule") provides that, for any surface waters with designated beneficial uses, the same designations are applied from a given control point to all upstream and downstream reaches to the next control point, if any.

3.4.1.3. Existing Groundwater Resources

Hydrogeologic Setting

There are no USEPA-designated sole-source aquifers within the Project area or in the State of Nevada (USEPA 2017). The principal aquifer that underlies the Project area is the basin-fill aquifer, which is in the Basin and Range Physiographic Province. The unconsolidated and consolidated basin-fill deposits are the most productive aquifers in the region and are typically located in individual alluvial basins separated by low mountain ranges. Primary groundwater resources used in the area are available from the unconsolidated basin-fill aquifer. Basin-fill sediments are composed of primarily unconsolidated sand and gravel of Quaternary and Tertiary age.

In general, groundwater from basin-fill aquifers within the Project area has dissolved solids concentrations that range from 0 to 500 milligrams per liter; however, the water throughout the basin-fill aquifer within the valleys is generally fresh (USGS 1995). In Clark County, the average total groundwater withdrawals are 85 million gal/day, and most of the groundwater is used for public water supply (USGS 1995). The Nevada Department of Water Resources (NDWR) database was reviewed to identify wells within 150 feet of the Project area (NDWR 2017). The average depth to groundwater of the wells in the vicinity of the Project area is 300 feet.

3.4.1.4. Wellhead Protection Areas

The NDEP has established programs to protect surface and groundwaters of the state. One of these programs is the NDEP Integrated Source Water Protection Program (ISWPP), which is designed to better engage and support local communities in source water protection and protect and provide safe drinking water (NDEP 2010). As a part of this program, NDEP provides local support to communities to develop and implement Community Source Water Protection Plans (CSWPPs). Over the years, these state and local programs have expanded from a focus on wellhead protection for groundwater sources to an ISWPP that includes groundwater wells, springs, and surface water sources. Through the ISWPP, communities are actively engaged in every aspect of source water protection planning including the identification and protection of Source Water Protection Areas (SWPAs). Based on a review of the available information, there is one domestic water well within 150 feet of the Project (NDWR 2017).

3.4.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, there would be no new direct or indirect impacts related to water resources, both surface and groundwater, from the Project. SWG would continue to operate and maintain the existing pipelines.

3.4.3 Environmental Effects of the Proposed Action

3.4.3.1. Existing Surface Water Drainages

Direct impacts to surface drainages would occur from ground-disturbing or polluting construction activities in waterbodies within the Project area. SWG developed the Project to avoid waterbodies to the maximum extent possible. No perennial waterbodies would be crossed by the Project; however, construction of the Project could result in minor, temporary impacts to 73 drainages, estimated on mapped National Hydrography Dataset (NHD) waterbodies crossed

by the Project. The Project is planned to be constructed within three phases. Phase I crosses 37 drainages, Phase II crosses seven drainages, and Phase III crosses 29 drainages.

Indirect impacts may result from long-term erosion of surface drainages or sediment discharge into waterbodies from soil erosion.

3.4.3.2. Floodplains

A portion of the proposed Project would cross the mapped 100-year floodplain; however, the Project would not result in an impact on the floodplain because the Project area would be returned to pre-construction conditions to the extent feasible. The Project would not result in a ground elevation change; therefore, it would not impact the floodplain.

3.4.3.3. Wetlands

The Project would not result in direct or indirect impacts to wetlands, as no wetlands were identified in the Project area.

3.4.3.4. Groundwater, Wells, and Source Water Protection Areas

In general, shallow groundwater is not present within the Project area; thus, there would be no direct or indirect impact to groundwater resources.

Prior to construction SWG would review NDEP ISWPP well information and determine proximity of the Proposed Action to drinking water wells. If drinking water wells are within proximity (approximately 150 feet) to Project disturbance, SWG may develop a well monitoring plan to identify pre- and post- construction monitoring of drinking water wells that could be impacted by Project construction.

Operations and Maintenance

Operations and maintenance may result in temporary impacts to waterbodies. If work occurs near waterbodies, SWG would implement BMPs to minimize impacts to waterbodies.

3.4.4 Cumulative Impacts of the Proposed Action

Cumulative impacts on water resources would occur if multiple projects in the Project vicinity are impacting the same water sources when they are flowing. However, because the surface drainages in the Project area are ephemeral, and construction would take place when the streams are dry, cumulative impacts are anticipated to be minimal. In addition, because all drainages impacted during the Proposed Action would be restored after construction, the severity of cumulative impacts are further reduced.

3.4.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.4.6 Residual Impacts

Residual impacts are contingent on the use of BMPs and mitigation measures during construction. If construction occurs during the dry season, and all drainages are restored after construction, residual impacts are not expected.

3.5 Soils

3.5.1 Affected Environment

Detailed soil map units within the Project area were identified using the Natural Resource Conservation Service's (NRCS's) Web Soil Survey (WSS; NRCS 2017) and are detailed on **Figure 16; Appendix E** and in **Table 9; Appendix A**. The Project crosses 23 soil map units. Soil units 141 (Nipton-Haleburu-Rock outcrop association) and 532 (Seanna-Goldroad-Rock outcrop association) represent prominent rock outcrops within the corridor. The other 21 soil units are mostly deep and well drained except for petrocalcic precipitated deposits. These deposits express themselves in areas in which carbonate minerals have been leached, accumulated, and precipitate in the form of sharp, hardened outcrops. Texturally, most of soils are very gravelly sandy silts containing some loam and clay.

On average, soils in the Project area are lowly to moderately susceptible to wind erosion. Erosion potential of in-place soils by water is generally low due to the presence of well to excessively drained soils; however, erosion by water was observed during field studies in multiple locations throughout the Project corridor (Arcadis 2018b).

The presence of desert pavement and biocrust was evaluated during vegetation surveys in the Project area (Arcadis 2020a). Desert pavement was found to cover 1.18 percent of the surveyed area. Desert pavement was most often observed in the northern portion of the Project area (Phase II); it was observed less commonly in the central portion (Phase I) and least commonly in the southern portion (Phase III). Biocrust was found to cover 0.31 percent of the surveyed area; it was most often observed in the northern and southern portions of the Project area (Phases II and III), with relatively few observations in the more disturbed central portion (Phase I).

During the field review, evidence of potentially significant soil contamination (e.g., soil staining, trash piles) requiring sampling (i.e., staining of areas greater than 10 square feet) was not identified within the Project area (Arcadis 2018c). Evidence of infrastructure associated with the existing natural gas pipelines, solar farms, private junkyard or storage yards, and transmission lines was observed throughout the Project area. There was no evidence of spills or soil contamination in association with the above-mentioned existing infrastructure.

3.5.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, there would be no new direct or indirect impacts to the soil resources from the Project. SWG would continue to operate and maintain the existing pipelines.

3.5.3 Environmental Effects of the Proposed Action

Soil limitations and potential impacts were assessed using the NRCS WSS (NRCS 2017). **Table 10; Appendix A** summarizes the impacts for each soil map unit. Impacts are shown for characteristics such as the potential for erosion (from water and wind), restoration potential, resistance to compaction, drainage class, approximate depth to bedrock, and potential for trench caving.

The soil types within the Project area have variable potentials for wind and water erosion (**Table 11; Appendix A**). Construction in the construction ROWs would expose bare soil, increasing the potential for erosion by both wind and water. Wind erosion commonly occurs on dry, fine, sandy soils when vegetative cover is lacking and strong winds are prevalent. Erosion also is related to

the capacity for water to pass through the soil surface. Slope gradient, vegetation cover, and the amount of rainfall also influence erosion by water. Erosion from water is most severe on moderate to steep slopes during high-intensity rainfall or rapid snowmelt. Without adequate protection, erosion may result in the discharge of sediment into drainages.

Movement of heavy equipment within the construction ROWs can result in soil compaction. The potential for soil compaction would increase where heavy equipment operates on wet soils with high clay content. Compaction results in a loss of pore space in the soil, which restricts water penetration, development of vegetation roots, and the diffusion rate of oxygen into soils.

Operations and Maintenance

Operations and maintenance would result in temporary impacts to soil. SWG would implement BMPs described in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA to minimize impacts.

3.5.4 Cumulative Impacts of the Proposed Action

Similar to geological impacts, cumulative impacts of the Proposed Action resources depend on disturbance of the same soil region by multiple projects and would be localized within the immediate ROW corridor. Projects that involve significant ground disturbance, including the construction of solar farms, transmission lines, and utility corridors, directly adjacent to or within the Proposed Action are present; therefore, continued disturbance of the same soil units, and thus cumulative impacts, are likely.

3.5.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.5.6 Residual Impacts

Residual impacts include continued erosion, soil loss, and loss of the potential for desert pavement and biocrust. Severity of residual impacts on soil are contingent on adherence to all BMPs and mitigation measures described in **Section 3.5.5.**

3.6 Vegetation

3.6.1 Affected Environment

3.6.1.1. Vegetation Cover Types

The Project is primarily located within the Creosote Bush-Dominated Basins Ecoregion; however, the very southern portion of the Project is located within the Arid Valleys and Canyonlands Ecoregion of the Mojave Basin and Range. Vegetation mapping in the Project area (**Figure 17; Appendix E**) was initially identified based on a desktop review of the Nevada Vegetation Synthesis Map (Peterson 2008a) and then verified with on-site field work. The SynthMap is a geospatial reference layer that includes complied vegetation mapping data primarily from the Southwest Regional Gap Analysis Project (Prior-Magee et al. 2007) and LANDFIRE (2017). The vegetation classification in SynthMap follows the International Vegetation Classification Systems (Grossman et al. 1998). The Project area was mapped into 13 separate ecological communities. The names, total acres, and percentages of each community in the Project area are shown in **Table 12; Appendix A**.

The Project area is dominated by the ecological community type Sonora-Mojave Creosotebush-White Bursage Desert Scrub, identified in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012). Ecological community types observed in the Project area are described below. Special status plants species are discussed in **Section 3.8**.

3.6.1.2. Sonoran-Mojave Creosotebush-White Bursage Desert Scrub

There are approximately 755.38 acres (74.60 percent) within the Project area occurring on BLM-administered Land classified as Sonora-Mojave Creosote Bush-White Bursage Desert Scrub. This community is dominated by two widespread shrubs of creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). This ecological community covers valleys, plains, and low hills of the Mojave and lower Sonoran Deserts, and in addition to creosote bush and white bursage, a range of large shrubs, dwarf shrubs, herbaceous species, and cacti may be present in large numbers, comprising many associations within this shrubland alliance (Peterson 2008b, NatureServe 2017a). Observed cacti species included California barrel cactus (*Ferocactus cylindraceus*), Engelmann hedgehog cactus (*Echinocereus englemannii*), common fishhook cactus (*Mammillaria tetrancistra*), species of cholla (*Opuntia*), and others. Observed herbaceous species included desert mallow (*Sphaeralcea ambigua*), desert fiddleneck (*Amsinckia tessellata*), desert trumpet (*Eriogonum inflatum*), rigid spiny herb (*Chorizanthe rigida*), heliotrope phacelia (*Phacelia crenulata*), and many others.Sonora-Mojave Creosote Bush-White Bursage Desert Scrub contributes to the warm desert and mixed desert scrub habitat types identified in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012).

3.6.1.3. North American Warm Desert Riparian Systems

There are approximately 137.89 acres (13.62 percent) within the Project area occurring on BLM-administered Land classified as North American Warm Desert Riparian Systems, which includes North American Warm Desert Wash. This ecological community is present in low-elevation riparian corridors and washes (< 1200 meters [m]) in the southwestern U.S. The predominant feature is a substantial impact from fluvial factors including periodic flux in flooding, sediment transport, and water table levels. The vegetation that occurs in North American Warm Desert Riparian Systems and in Desert Washes is a mix of riparian and wash species, but the exact community composition varies depending on site-specific conditions including persistence of free water in the root zones of dominant plants (Peterson 2008a, NatureServe 2017b). The most common desert riparian vegetation observed in washes in the area included catclaw acacia shrublands (*Acacia [Senegalia] greggii* Shrubland Alliance), with occasional desert-willow shrublands (*Chilopsis linearis* Shrubland Alliance). Associated shrubs included cheesebush (*Ambrosia salsola*); desert senna (*Senna armata*); paperbag bush (*Scutellaria mexicana*); white rattany (*Krameria bicolor*); and goldenhead (*Acamptopappus sphaerocephalus*); along with herbaceous species of buckwheat (*Eriogonum* spp.), evening snow (*Linanthus dichotomus*), tansy mustard (*Descurainia pinnata*), and others. More information about wetlands in the Project area is presented in **Section 3.4.1.1.2**. North American Warm Desert Riparian Systems contribute to the warm riparian habitat type identified in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012).

3.6.1.4. Mojave Mid-Elevation Mixed Desert Scrub

There are approximately 38.57 acres (3.81 percent) within the Project area occurring on BLM-administered Land classified as Mojave Mid-Elevation Mixed Desert Scrub. The dominant species that occur in this ecological community include Joshua tree (*Yucca* [*Hesperoyucca*]

brevifolia) and blackbrush (*Coleogyne ramosissima*), which can occur together as an association (*Yucca brevifolia/Coleogyne ramosissima* Wooded Shrubland Association) or can form distinct stands. The observed associated species vary but include desert shrubs such as Cooper's boxthorn (*Lycium cooperi*), woolly bursage (*Ambrosia eriocentra*), cheesebush, species of horsebrush (*Tetradymia*), and herbaceous species such as desert marigold (*Baileya multiradiata*). Mojave Mid-Elevation Mixed Desert Scrub occurs in the transition zone between Sonora-Mojave Creosotebush-White Bursage Desert Scrub and lower montane woodlands Mojave Mid-Elevation Mixed Desert Scrub is found in the transition zone between Sonora-Mojave Creosotebush-White Bursage Desert Scrub and lower montane woodlands (Peterson 2008b, NatureServe 2017c). Mojave Mid-Elevation Mixed Desert Scrub contributes to the warm desert and mixed desert scrub habitat type as identified in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012).

3.6.1.5. Developed Land

Approximately 49.57 acres (5.25 percent) within the Project area occurring on BLM-administered Land are classified as Medium Intensity, Low Intensity, and Open Space developed lands that differ in intensity by the ratio of impervious surfaces to vegetation. These areas are mostly associated with areas directly adjacent to U.S. Highway 95 and in the BLM-administered land at the very northern end of the Project area frequently utilized by the public.

3.6.1.6. Other land cover types

Sonora-Mojave Mixed Salt Desert Scrub and Inter-Mountain Basins Semi-Desert Shrub Steppe together make up approximately 19.18 acres (1.89 percent) of the Project area occurring on BLM-administered Land. Sonora-Mojave Mixed Salt Desert Scrub is dominated by saltbush (*Atriplex spp.*), including allscale saltbush (*Atriplex polycarpa* Shrubland Alliance) and four-wing saltbush (*Atriplex canescens* Shrubland Alliance), both of which were observed on site, often in association with saltgrass (*Distichlis spicata*). Inter-Mountain Basins Semi-Desert Shrub Steppe is dominated (>25 percent cover) by grasses, but typically contains a woody layer of shrubs and dwarf shrubs. Exotic grasses such as red brome (*Bromus madritensis*) may be common in disturbed shrublands as well (NatureServe 2017e).

Approximately 8.20 acres (0.81 percent) of the Project area occurring on BLM Land are occupied by a combination of North American Warm Desert Pavement, North American Warm Desert Badland, North American Warm Desert Sparsely Vegetated Systems, and North American Warm Desert Bedrock Cliff and Outcrop. In most of these habitats, vegetation is sparse (2 percent) because the ground surface is primarily made up of bedrock or unconsolidated sediments (NatureServe 2017d).

3.6.2 Cacti and Yucca

The regulation of cactus and yucca species protection and removal is listed under State of Nevada statutes NRS 527.050 – 527.110. Guidelines and BMPs for protection and salvaging cacti and yucca in southern Nevada are published by BLM Sothern Nevada District Office.

As documented in the Botanical Resources Report (Arcadis 2020a) ten species of cactus and two species of yucca were observed in the Project area. For both cactus and yucca species, high densities (up to 57 plants per acre) occurred in Sonora-Mojave Mixed Salt Desert Scrub and in Inter-Mountain Basins Semi-Desert Shrub-Steppe (**Table 15; Appendix A**). In Sonora-Mojave

Creosote Bush-White Bursage Desert Scrub, North American Warm Desert Riparian Systems and Mojave Mid-Elevation Mixed Desert Scrub cacti and yucca occurred as intermediate densities (5 to 9 plants per acre – **Table 15; Appendix A**). Phase I Project areas support approximately 4 cactus or yucca individuals per acre. Phase II and Phase III support approximately 3 and 18 individuals per acre, respectively.

3.6.3 Noxious and Non-Native, Invasive Weeds

Under Executive Order (EO) 13112, Invasive Species, federal agencies are required to prevent the introduction and spread of invasive species and to support efforts to eradicate and control invasive species that are established. Additionally, noxious weeds are also regulated under the Federal Noxious Weed Act (7 U.S.C. 2801 et seq. 1974) and the Nevada Revised Statutes (NRS), Chapter 555.05, which mandates control measures for specific noxious weeds. Additionally, the Nevada Department of Agriculture (NDA) defines Category B noxious weeds as weeds that are generally established in scattered populations in some counties of the state (NDA 2019). The NDA defines Category C weeds as weeds that are generally established and generally widespread in many counties of the state (NDA 2019). BMPs for integrated weed management in southern Nevada are published by the LVFO.

Based on the Botanical Resources Report (Arcadis 2020a) and data from the BLM, common invasive species occur in the Project area. Seven taxa of invasive weeds were observed in the Project area (**Table 13; Appendix A**). The most common were Mediterranean (*Schismus arabicus*) grass species, with more than 96 million plants extrapolated across the Project area (**Table 14; Appendix A**). Red-stemmed filaree (*Erodium cicutarium*) and brome grasses (*Bromus madritensis* and *B. rubens*), at more than 20 million individuals and 3.5 million individuals, respectively, were also common in the Project area. The other weed species observed were much less common, with approximately 94,000 Sahara mustard (*Brassica tournefortii*) plants, an invasive non-native Category B noxious weed, and 3,000 plants each of Russian thistle and London rocket (**Table 14; Appendix A**). Additionally, an observed occurrence of puncturevine (*Tribulus terrestris*), an invasive non-native Category C noxious weed, was noted during the 2017 and 2018 preliminary field surveys.

3.6.4 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no new direct or indirect impacts to vegetation would occur as the result of the Project. SWG would continue to operate and maintain the existing pipelines.

3.6.5 Environmental Effects of the Proposed Action

The total Project area includes 1,012.61 acres of BLM-administered lands. Of this area Project area ground disturbance would result in direct impacts approximately 845.39 acres of various ecological community habitat types on BLM-administered lands including 368.41 acres of permanent ROW, 440.88 acres of TUP/temporary easement pipeline workspace, 28.84 acres of TUP/temporary easement staging areas, and 7.25 acres of TUP/temporary easement access roads. The details of Project impact on ecological communities by phase are shown in **Table 16; Appendix A**.

In all three phases, the primary vegetation type is Sonora-Mojave Creosotebush-White Bursage Desert Scrub. Therefore, the impacts to vegetation in all three phases are expected to be similar. Direct adverse impacts on local vegetative communities would primarily result from construction including cutting, clearing, and removing existing vegetation within the Project construction

workspace. As described in **Appendix B** Project impacts to vegetation would consist primarily of Overland Drive and Crush, Clear and Cut, and Clear and Cut with Soil Removal. Within the permanent pipeline ROW an 8-foot-wide corridor directly over the proposed pipeline within the permanent ROW would be cleared utilizing Clear and Cut with Soil Removal to allow for trench excavation and pipeline installation. The TUP/temporary easement pipeline workspace and TUP/temporary easement for three access roads where additional improvements are likely would require Clear and Cut for safe pipeline installation and equipment operation. The remaining portions of the permanent pipeline ROW and TUP/temporary easement staging areas are anticipated to utilize Overland Drive and Crush. Other direct impacts have the potential to occur from post-construction conditions including decreased density of desirable species and altered composition of vegetation, increased erosion potential and sediment runoff, and the introduction or spread of noxious weeds and other invasive species. Indirect impacts on vegetation may occur primarily from the potential spread of unwanted species on or adjacent to the ROW after construction.

Impacts on vegetation from construction of the Project would be lessened by implementing minimization strategies during pre-construction planning using specialized construction techniques and measures, implementing appropriate restoration techniques, including cacti and yucca salvaging, and conducting post-construction monitoring.

Indirect adverse impacts on vegetation include the slow re-establishment time of desert plants, and therefore potentially reduced reproductive and germination success for cleared species.

Operations and Maintenance

Operations and maintenance may result in temporary impacts to vegetation and continue to influence the introduction and spread of non-native species. SWG would implement BMPs described in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.to minimize impacts.

3.6.6 Cumulative Impacts of the Proposed Action

Sensitive plant species beyond the ROW of the proposed Project area may experience cumulative adverse effects due to the volume of projects in the immediate vicinity. Construction and ground-disturbing actions may lead to soil compaction, trampling, or removal of vegetation. Smaller population sizes due to Project-related vegetation removal, or an increase in distance between plant individuals, may decrease pollination and propagation rates for rare and sensitive plant species. In addition, ground disturbance and increased motor vehicle transport may facilitate the spread of invasive or noxious species, increasing competition with native species in and around the Project area. However, each project is required to minimize vegetation removal and implement restoration efforts, such as erosion control, topsoil salvage, and revegetation plans, to alleviate direct and indirect adverse cumulative effects on vegetative communities.

3.6.7 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.6.8 Residual Impacts

Residual impacts on vegetative communities within the Project area stem from the lag time between revegetation measures and actual vegetative regrowth. Even with re-seeding measures,

parts of the Project area may take longer to revegetate than others based on topography, water availability, and microclimate. In addition, the lag time between seeding and regrowth may vary based on the different life history traits and germination success of the different plant species.

3.7 Terrestrial Wildlife

3.7.1 Affected Environment

As discussed in **Section 3.6**, the dominant vegetation type in the Project area is desert scrub, particularly Mojave warm desert and mixed desert scrub. Mojave warm desert and mixed desert scrub is one of 22 key habitats identified in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012). Important elements of the Mojave warm desert and mixed desert scrub habitat for wildlife use include dwarf shrubs, yucca (*Yucca baccata*), and mesic blackbrush communities, as well as rocks and canyons, for cover and nesting structure; washes for foraging; and sandy soils for burrowing and creating dens (Wildlife Action Plan Team 2012). Other habitat and land cover types present include limited riparian areas associated with drainages, shrub-steppe, sparsely vegetated desert (e.g., badlands), and developed areas. These habitat and land cover types provide habitat for a variety of terrestrial wildlife species. The only water features present in the Project area are drainages, which do not have flow sufficient to support fish, amphibians, or other wildlife requiring aquatic habitat. Arcadis, under contract to SWG, conducted wildlife surveys in October and November 2017 to determine wildlife use of the Project area (Arcadis 2018f).

Desert ecosystems typically exhibit a low diversity of wildlife species relative to mountain or forest ecosystems. In general, the wildlife species and their habitats are common and widely distributed throughout the region. Wildlife discussed in this section include mammals (big game, predators, and bats), birds (upland game birds and migratory birds), and reptiles. Special status wildlife species, including USFWS Threatened, Endangered, Proposed, and Candidate Species and BLM Sensitive Species, are discussed in **Section 3.8**.

3.7.1.1. Mammals

Many mammalian species occur in the Project area and vicinity including big game, predators, and bats.

Big Game

Big game species with Nevada Department of Wildlife (NDOW)-designated habitat in the vicinity of the Project area include desert bighorn sheep (*Ovis canadensis nelsoni*) and mule deer (*Odocoileus hemionus*) (NDOW 2017a). One patch of occupied mule deer distribution is present within 4 miles of southern portions of the Project area, but no occupied mule deer distribution occurs in the Project area; therefore, mule deer would not be discussed further.

Portions of the Project area within Project Phase II are located within occupied desert bighorn sheep distribution; no portions of the Project area within Project Phases I and III are located in occupied desert bighorn sheep distribution, but portions of Project Phases I and III are within 4 miles of occupied desert bighorn sheep distribution (**Figure 18; Appendix E**). All occupied desert bighorn sheep distribution within the Project area is located on BLM land. Desert bighorn sheep have potential to occur in the Project area year-round (BLM 2014). The breeding season generally occurs from July through December in southern Nevada (NDOW 2017b). No desert

bighorn sheep or other big game species were observed during field surveys, but desert bighorn sheep scat and skeletons were observed during surveys (Arcadis 2018f).

Year-round hunting habitat for predator species is available throughout the Project area. Predators that may occur or are known to occur in the vicinity of the Project area include bobcat (*Lynx rufus*) and gray fox (*Urocyon cinereoargenteus*) (NDOW 2017a). No predator species were observed during field surveys, but coyote (*Canis latrans*) scat was observed (Arcadis 2018f).

Bats

Year-round foraging habitat for bat species is available throughout the Project area. Subsurface mines, caves, and other rock formations that bats could use for roosting and hibernation are not known to occur in the Project area but may be present in the surrounding area. Special status species of bats that may occur or are known to occur in the vicinity of the Project area are discussed in **Section 3.8**. Other species that may occur or are known to occur in the vicinity of the Project area include fringed myotis (*Myotis thysanodes*), Mexican free-tailed bat (*Tadarida brasiliensis*), silver-haired bat (*Lasionycteris noctvagans*), spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsendii*), and hoary bat (*Lasiurus cinereus*) (NDOW 2017a, 2013). No bats were observed during surveys (Arcadis 2018f).

3.7.1.2. Birds

Habitat for upland game birds and migratory birds, including raptors, is present throughout the Project area.

Upland Game Birds

The Project area is within Gambel's quail (*Callipepla gambelii)* year-round range (NDOW 2017c), and habitat is available throughout the Project area. No other NDOW-designated upland game bird species are known to potentially occur in the Project area (NDOW 2017c). The only NDOW-designated upland game bird species observed during surveys was Gambel's quail (Arcadis 2018f).

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA [16 U.S.C. 703-711]). Bald eagles and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). The MBTA prohibits the take of any migratory bird, part, nest, egg, or product thereof, with "take" defined as to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect. Most species of birds in the U.S. are legally protected under the MBTA. Exceptions to this statute include game and non-native species.

Birds of Conservation Concern (BCCs) are species (beyond those already designated as federally threatened or endangered) that represent the highest conservation priorities of the USFWS. In U SFWS (2008), BCCs are listed by Bird Conservation Regions (BCRs), which are broad, ecologically distinct geographic regions in North America that have similar bird communities, habitats, and resource management issues. The Project area is located within BCR 33 (Sonoran and Mojave Deserts U.S. portion only; USFWS 2008). BCCs for this BCR that have the potential to occur in the Project area are listed in **Table 17; Appendix A**.

Raptors identified during surveys include golden eagle (*Aquila chrysaetos*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), red-

tailed hawk (*Buteo jamaicensis*), and short-eared owl (*Asio flammeus*). Special status species of raptors that may occur or are known to occur in the vicinity of the Project area are discussed in **Section 3.8**. Other raptors that may occur or are known to occur in the Project area and vicinity include barn owl (*Tyto alba*), ferruginous hawk (*Buteo regalis*), northern goshawk (*Accipiter gentilis*), Swainson's hawk (*Buteo swainsoni*), and turkey vulture (*Cathartes aura*) (NDOW 2017a, 2013). While many raptors use trees and cliff walls for nesting sites, some species nest on the ground. Ground is the primary nesting site type available for raptors in the Project area. There are 341 raptor nests known to occur within 10 miles of the Project area (NDOW 2017a). Hunting habitat for raptors is available throughout the Project area.

Thirty-four species of non-raptorial migratory birds were identified during surveys (Arcadis 2018f). Special status species of non-raptorial migratory birds that may occur or are known to occur in the vicinity of the Project area are discussed in **Section 3.8**. Other species that may occur or are known to occur in the Project area and vicinity include ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-headed grosbeak (*Pheucticus melanocephalus*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), bushtit *(Psaltriparus minimus*), cactus wren (*Campylorhynchus brunneicapillus*), common wren (*Corvus corax*), house finch (*Carpodacus mexicanus*), ladder-backed woodpecker (*Picoides scalaris*), lesser goldfinch (*Spinus psaltria*), northern mockingbird (*Mimus polyglottos*), phainopepla (*Phainopepla nitens*), pinyon jay (*Gymnorhinus cyanocephalus*), ruby-crowned kinglet (*Regulus calendula*), sage thrasher (*Oreoscoptes montanus*), Say's phoebe (*Sayornis saya*), Scott's oriole (*Icterus parisorum*), song sparrow (*Melospiza melodia*), Virginia's warbler (*Vermivora virginiae*), and white-crowned sparrow (*Zonotrichia leucophrys*) (NDOW 2017a, 2013). Breeding and foraging habitat for non-raptorial birds is available throughout the Project area.

3.7.1.3. Reptiles

Reptiles observed during surveys included side-blotched lizard (*Uta stansburiana)*, zebra-tail lizard (*Callisaurus* sp.), desert horned lizard (*Phrynosoma platyrhinos*), and long-nosed leopard lizard (*Gambelia wislizenii*) (Arcadis 2018f). Special status reptile species that may occur or are known to occur in the vicinity of the Project area are discussed in **Section 3.8**. Other reptile species that may occur or are known to occur in the Project area and vicinity include desert iguana (*Dipsosaurus dorsalis*), desert rosy boa (*Lichanura trivirgata*), desert horned lizard (*Phrynosoma platyrhinos*), and desert night lizard (*Xantusia vigilis*) (NDOW 2017a, 2013). Breeding and foraging habitat for reptiles is available throughout the Project area.

3.7.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no new direct or indirect impacts on wildlife would occur as a result of the Project. SWG would continue to operate and maintain the existing pipelines.

3.7.3 Environmental Effects of the Proposed Action

Potential direct impacts on wildlife include the killing, injuring, harassing, and displacement of individuals within the Project area. Impacts on wildlife and their habitat would be similar for the three Project phases, except for occupied desert bighorn sheep distribution, which would only be impacted in Project Phase II. Impacts on the various vegetation communities that provide habitat for wildlife are described in **Section 3.6**.

Project construction would result in short-term habitat loss and fragmentation for wildlife species including mammals, upland game birds, migratory birds, and reptiles. In most instances, habitat loss would have minor impacts on wildlife species because the Project area is in previously disturbed areas adjacent to existing pipelines. Wildlife can also seek refuge in adjacent habitat of similar quality. Habitat reduction would have minimal effects on common habitat generalist species (i.e., rabbits, coyotes, ravens, rodents, and snakes) that are not tightly restricted to a specific habitat type.

Impacts would result from increased traffic levels, noise, and human presence during construction. These increases would be short-term and would subside once construction is complete. In developed areas, the amount of disturbance associated with construction would be similar in scale to current activities such as road maintenance and other utility installations and operations. Wildlife species in these areas are habituated to such activities and, therefore, are not likely to be affected.

Impacts on wildlife would be minimal because of the short-term and localized nature of construction as well as implementation of protective measures. No new aboveground facilities are planned. No major alterations to wildlife use and occurrence patterns, or to ecosystems or biodiversity, would occur from the construction and operation of this Project.

Operations and Maintenance

During pipeline operation and maintenance, there would be limited to infrequent traffic and human presence along the pipeline ROW, similar to the current level of activity associated with the existing pipelines.

3.7.4 Cumulative Impacts of the Proposed Action

Cumulative impacts on wildlife would occur as a result of the Proposed Action. Past and continued development and construction within the vicinity of the Project area leads to fragmentation and degradation of natural habitat for desert wildlife species. In addition, cumulative vegetation removal and disturbance in the vicinity of the Project area can further exacerbate habitat loss. The severity of the adverse cumulative impacts on wildlife is contingent on adherence to project-specific BMPs and mitigation measures.

3.7.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.7.6 Residual Impacts

Residual impacts on wildlife would occur as the result of vegetation clearing for construction. There would be a lag period between revegetation measures and the actual regrowth of plant species. For that time, available habitat in the Project area would be reduced. These impacts would be temporary, but the regrowth time would vary based on the life history traits of the different plant species.

3.8 Threatened, Endangered, or Sensitive Species

3.8.1 Affected Environment

The USFWS Information for Planning and Conservation (IPaC) website (USFWS 2017) identified southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo

(*Coccyzus americanus*), Mojave desert tortoise (*Gopherus agassizii*), bonytail chub (*Gila elegans*), Pahrump poolfish (*Empetrichthys latos*), and razorback sucker (*Xyrauchen texanus*) as the federal Threatened, Endangered, Proposed, or Candidate species that may occur in the vicinity of the Project area. However, based on review of the habitat available in the Project area, Mojave desert tortoise is the only federal Threatened, Endangered, Proposed, or Candidate species with potential to occur in the Project area. No aquatic habitat is available in the Project area to support bonytail chub, Pahrump poolfish, or razorback sucker; therefore, these species would not be discussed further. Both yellow-billed cuckoo and southwestern flycatcher require riparian habitat dominated by willows (*Salix* spp.) and other riparian shrubs and trees. The required habitat for yellow-billed cuckoo and southwestern flycatcher is not present in the Project area; therefore, these species are not discussed further.

3.8.1.1. Mojave Desert Tortoise

The Threatened Mojave desert tortoise inhabits flats and bajadas with soils ranging from sand to sandy gravel as well as rocky terrain and slopes. The desert tortoise primarily occupies creosote, creosote-bursage, and creosote-blackbrush communities in saltbush scrub, creosote scrub, and blackbrush scrub habitat types. Within these vegetation types, habitat requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow (BLM 2017).

The Project is primarily located within the Creosote Bush-Dominated Basins Ecoregion, with the southernmost portion of the Project located within the Arid Valleys and Canyonlands Ecoregion of the Mojave Basin and Range. Portions of the Project area are located within Piute-Eldorado Valley Area of Critical Environmental Concern (ACEC) as well as within areas of designated critical habitat for the Mojave desert tortoise. The Piute-Eldorado Valley ACEC was established in the 1998 BLM RMP specifically for desert tortoise management within the Northeastern Mojave and Eastern Mojave recovery units of the Tortoise Recovery Plan (BLM 1998, 2014). Approximately 693.42 acres of the Project area are located within the Piute-Eldorado Valley ACEC, and approximately 819.32 acres of the Project area within designated critical habitat for the Mojave desert tortoise. For the most part, Mojave desert tortoise critical habitat is located on BLM-administered lands within the Piute-Eldorado Valley ACEC; however, approximately 113.06 acres of Mojave desert tortoise critical habitat are located on lands managed by Boulder City,12.49 acres on NDOT ROW, and 0.06 acres on private land.

The habitat within the Project area for Phase I is discussed **Section 3.6**. Vegetation throughout the majority of the Project area consists of Mojave warm desert and mixed desert scrub, which is preferred habitat for Mojave desert tortoise. Soils within Phase I are discussed in **Section 3.5**. Mojave desert tortoise typically prefer sand to sandy gravel soils associated with scattered shrubs to provide cover and allow for space for the growth of key forage species. The Mojave population of the desert tortoise is generally associated with communities dominated by creosote bush, often with other shrubs such as white bursage (*Ambrosia dumosa*) or saltbush (*Atriplex* spp.) occurring as co-dominants with small cacti present (USFWS 2011). This population also prefers sandy loam or rocky soils in valleys, bajadas, and hills. They can be found at elevations up to approximately 5,500 feet above mean sea level (amsl; USFWS 2011). Mojave desert tortoise ranges may vary, but an average male can use up to 200 acres; connected areas of intact habitat are necessary for species viability (Berry 1986).

A presence or absence survey for the Mojave population of desert tortoise was conducted between October 13 and November 1, 2017 and between May 7 and 18, 2018 (Arcadis 2018a,g). Using geographic information system (GIS) tools, perpendicular (east/west) transects spaced 30 feet (10 m) apart were overlain on the approximate 69.5-mile, 500-foot-wide survey corridor along the proposed pipeline alignment. This survey corridor corresponds to the "action area" for the Project. A total of 4,407 acres (approximately 98 percent) of the total 4,482-acre action area were surveyed. The remaining 2 percent of the action area was not surveyed due to lack of landowner access approval. The surveys were conducted in accordance with and based on recommendations by the USFWS (USFWS 2017; Wise 2017; Arcadis 2018a).

Ten live Mojave desert tortoises were documented during the survey, observed inside and outside their burrows within the action area. Desert tortoises outside their burrows were observed from a safe distance (greater than 10 feet), from which tortoise activity and approximate midline carapace length (MCL) data were collected. Desert tortoises were located within their burrows by using a mirror or flashlight. Other signs of tortoises were observed. Twenty-five carcasses were documented, of which 13 were juveniles, nine were adult, and three were unknown due to their deteriorated condition. Other Mojave desert tortoise signs documented during the survey consisted of 572 burrows, 91 scats, five tracks, and 15 other signs (consisting of potential pallets and scutes; Arcadis 2018a).

3.8.1.2. BLM Sensitive Wildlife Species

BLM Sensitive Species are those that require special management consideration to avoid potential future listing under the ESA and are identified in accordance with procedures set forth in BLM Manual 6840 – Special Status Species (BLM 2008). **Table 17; Appendix A** identifies all BLM Sensitive Species for Nevada that occur or potentially occur in the Project area. In addition to identifying the species, the table summarizes the species' habitat preferences and the known or likely potential for occurrence. Habitat for species that are known to occur or have potential to occur is present throughout the Project area.

Of the species with potential to occur in the Project area, those observed during surveys include the loggerhead shrike (*Lanius ludovicianus)*, Le Conte's thrasher (*Toxostoma lecontei*), and the Mojave desert tortoise (*Gopherus agassizii*).

3.8.1.3. Special Status Plant Species

Appendix A; Table 17 is a summary list of state and federally listed plant species with potential to occur within the Project area or vicinity. While a number of different plant special species have the potential to occur within the Project area most are not known to occur and were not noted during surveys. On the request of the BLM surveys for the rosy two-toned beardtongue (*Penstemon bicolor ssp. roseus*) were completed in portions of the Project area containing potentially suitable habitat as identified by the BLM and previous vegetative surveys. No observations of rosy two-toned beardtongue were documented during the survey; however, this species has been identified within a mile of several segments of the Proposed Action and therefore the Project area contains potential habitat for the species (Arcadis 2020a).

3.8.1.4. BLM Programmatic Biological Opinion

In 2019, the USFWS finalized a programmatic biological opinion (PBO, USFWS 2019) with the BLM SNDO for potential effects on 19 federally listed species and critical habitat for 13 of these

species, including Mojave desert tortoise. The PBO includes potential effects from ROWs issued by the BLM consistent with the Proposed Action. Under the PBO, each BLM action that may result in an incidental take of a protected species must have an incidental take statement. For BLM actions that may result in impacts to desert tortoise, the PBO describes several mitigation and minimization measures.

The PBO allows the BLM and USFWS to "extend SNDO discretion to non-Federal lands" thus covering Project actions within the entire Project Area under the PBO if the private landowners agree and the BLM provides oversight of the Project to ensure compliance with the PBO.

3.8.1.5. Clark County Desert Conservation Program

In 2000 Clark County, Nevada prepared a Multiple Species Habitat Conservation Plan (MSHCP) to support the issuance of an incidental take plan for 79 species including Mojave desert tortoise (Clark County 2000b). The USFWS Section 10(a)(1)(B) incidental take permit associated with the Habitat Conservation Plan went into effect on February 1, 2001. Clark County is currently moving forward with plans to amend the MSHCP due to rapid growth in the county that has outpaced incidental take projections for disturbance. The MSHCP amendment processes is underway and is dependent on the establishment of proposed reserve units. Currently the draft MSHCP amendment and associated draft EIS are anticipated to be released for public review and comment by 2025.

The MSHCP is administered by Clark County and allows for the incidental take of listed species as well as other covered species and their habitat (including desert tortoise). The Clark County Desert Conservation Program implements the MSHCP's Section 10(a)(1)(B) incidental take permit for all non-Federal lands within Clark County. The MSHCP uses a reserve system consisting of public and private lands that are specifically managed for the maintenance of covered species.

The incidental take permit relies on the MSHCP reserve system which includes the Boulder City Conservation Easement (BCCE). The BCCE was established in 1995 by a partnership between Clark County and the City of Boulder City and is managed by the DCP. It was specifically created to protect habitat for desert tortoise as a mitigation effort for developmental impacts within Clark County. The BCCE is located on lands owned by Boulder City and includes portions of the Project Area on Boulder City lands south of the Boulder City Energy Zone. The BCCE includes specific restrictions and laws which are outlined under Boulder City Ordinance #972, Title 7, Chapter 5 (7-5-8).

3.8.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no new direct or indirect impacts to special status species would occur as a result of the Project. SWG would continue to operate and maintain the existing pipelines.

3.8.3 Environmental Effects of the Proposed Action

3.8.3.1. BLM Sensitive Wildlife Species

The loggerhead shrike and Le Conte's thrashers occupy similar habitat and have been observed within the Project area. Both species prefer open country with scattered trees and desert scrub communities. Le Conte's thrasher is particularly associated with saltbush flats and wash systems, which bisect the Project area.

Construction of the Project would result in short-term habitat loss, which would temporarily reduce habitat availability for both species. The Restoration and Revegetation Plan developed would address vegetation disturbances during construction. Following completion of construction, temporary impacts would be restored. In most instances, habitat loss would be minor for both species due to their high motility throughout their desired habitats and because the Project area is in previously disturbed areas adjacent to existing pipelines and roads. Following completion of construction, disturbed vegetation would be reseeded with native shrubs, grasses, and forbs to restore affected habitat unless otherwise directed by landowners.

3.8.3.2. Special Status Plant Species

Special status plant species, including the rosy two-toned beardtongue, were not identified during surveys. However, given that rosy two-toned beardtongue has been identified in previous surveys within a mile of the Project footprint and the short lifespan of this species (1-5 years), it is possible that this species may be present at the time of construction. Direct or indirect impacts could occur to sensitive plants as a result of the Proposed Action. Weed introduction or spread from the Proposed Action would have an indirect negative effect on beardtongue plants. The impacts would be localized and minor to the population of rosy two-toned beardtongue in southern Nevada.

3.8.3.3. Mojave Desert Tortoise

The Proposed Action has a may affect, likely to adversely affect determination for the federally threatened Mojave desert tortoise (*Gopherus agassizii*) and its designated critical habitat. Mojave desert tortoise is the only federal Threatened, Endangered, Proposed, or Candidate species to occur in the Project area. In general, construction of the Project would result in short-term habitat loss, which would temporarily reduce habitat availability for the desert tortoise. A Restoration and Revegetation Plan would be developed to address vegetation disturbance during construction. Following completion of construction, temporary impacts would be restored. In most instances, habitat loss would have minor impacts on desert tortoise because the Project area is in previously disturbed areas adjacent to existing pipelines and roads. Following completion of construction, areas of vegetation disturbed during construction would be reseeded with native shrubs, grasses, and forbs to restore affected habitat unless otherwise directed by landowners. After restoration is completed, desert tortoise are expected to reoccupy the affected areas to the extent that they currently use them.

Impacts to desert tortoise would result from increased traffic levels, noise, and human presence during construction. These increases would be short-term and would subside once construction is complete. In developed areas, the amount of disturbance associated with construction would be similar in scale to current activities such as road maintenance and other utility installations and operations.

A Desert Tortoise Monitoring, Mitigation, and Impact Minimization Plan would be developed before construction and in consultation with the USFWS and the BLM to further minimize the expected impacts to desert tortoise from the Project. This plan would include pre-construction, construction, and post-construction measures designed to limit direct impacts to desert tortoise during Project construction and operation.

Issuance of the BLM grant for the Proposed Action would include the issuance of an incidental take statement which would subsequently be appended to the BLM PBO under Section 7 of the ESA.

As described in **Section 3.1** the impact analysis to desert tortoise considers impacts to functional desert tortoise habitat which includes undisturbed desert tortoise habitat and previously disturbed desert tortoise habitat that has recovered and is now considered functional desert tortoise habitat. Each of the Project phases would have slightly different overall impacts on functional desert tortoise habitat, as each phase would impact areas with varying use by desert tortoise. In general, the quality of habitat within the Project area varies. Details on the phase-specific desert tortoise potential impacts are described below and shown in **Table 12** and **Table 18; Appendix A**.

Phase I: Searchlight Crossover to Eldorado Tap

Of the approximately 344.23 acres of functional desert tortoise habitat impacted for the construction of Phase I on both BLM and non-BLM land, 255.65 acres are located within designated Mojave desert tortoise critical habitat. Of these, 171.86 acres are located within critical habitat on BLM-administered land and within the Piute-Eldorado Valley ACEC, 77.62 acres are within designated Mojave desert tortoise critical habitat on land managed by Boulder City, and 6.17 acres are located within NDOT ROW (**Figure 19; Appendix E**).

During the presence or absence survey (Arcadis 2018a), evidence of human use, including unauthorized dumping on BLM and adjacent private land, was encountered in the survey area west of Searchlight from approximately Project milepost 31.4 to milepost 35.6. Due to steeper terrain substrate and signs of human use, this section would be considered reduced quality Mojave desert tortoise habitat and is not a part of designated critical habitat or the ACEC. Desert tortoise impacts in this area are anticipated to be minor due to currently existing disturbance and reduced habitat quality.

Phase II: Eldorado Tap to Horizon Ridge Pressure Limiting Station

Of the approximately 120.54 acres of functional desert tortoise habitat impacted for the construction of Phase II on BLM and non-BLM land, none is located within the Piute-Eldorado Valley ACEC or designated Mojave desert tortoise critical habitat. (**Figure 19; Appendix E**).

During the presence or absence survey (Arcadis 2018a), it was noted that the area 7 miles directly south of Henderson from milepost 62.0 to milepost 69.5 appeared to be more frequently used by people, with evidence of off-road vehicle use and unauthorized dumping of debris. This area is also characterized by steeper topography and more rocky terrain. Mojave desert tortoise signs and burrows were infrequently observed in this area, and while desert tortoise may use portions of this area, the habitat conditions were generally of reduced quality. This portion of the action area consists of a narrower valley between Black Hill and Black Mountains. Identified as part of the desert tortoise least cost corridor to provide connectivity between Mojave desert tortoise habitat areas, the soils in the northern portions of Phase II are more compacted and rocky; therefore, they are less conducive to use by burrowing animals including Mojave desert tortoise. In addition, the Phase II proposed pipeline alignment is directly adjacent to existing solar facilities and associated fencing, which in places runs on either side of the SWG existing pipeline ROW. Mojave desert tortoise exclusion fencing and tortoise guards are in place in association with the roads and entrances for the solar facilities.

Phase III: Intersection Point Station to Searchlight Crossover

Of the approximately 325.72 acres of functional desert tortoise habitat impacted for the construction of Phase III on BLM and non-BLM land, 238.80 acres are located within designated Mojave desert tortoise critical habitat. Of these, 237.85 acres are located within critical habitat

on BLM land and within the Piute-Eldorado Valley ACEC, and 0.95 acre is located within NDOT ROW (**Figure 19; Appendix E**).

During the presence or absence survey (Arcadis 2018a), habitat conditions and reduced habitat quality were noted in the southernmost portion of the survey area where the pipeline crosses Highway 163 from Project milepost 0.0 to milepost 5.8. As the proposed pipeline alignment approaches the Colorado River, it leaves Creosote Bush-Dominated Basins Ecoregion common to the action area and enters the Arid Valleys and Canyonlands Ecoregion. Mojave desert tortoise habitat in this southernmost portion of the action area is of lower quality compared to the designated critical habitat within the ACEC, likely due to changes in the vegetation community, reduced forage availability, and subtle changes to substrate that may be less conducive to burrowing. Desert tortoise impacts in this area are anticipated to be minor due to existing disturbance and reduced habitat quality.

Operations and Maintenance

Conditions during pipeline operation and maintenance would be consistent with the existing conditions with limited to infrequent traffic and human presence along the existing pipeline ROW and road. No new or expanded access would be needed for SWG to operate and maintain the new pipeline after completion. Maintenance and operation of the Project would result in long-term yet minor disturbance because similar disturbances already occur in association with the existing pipelines. Regular operations and maintenance would include routine visits to perform activities such as safety inspections and monitoring, pigging and integrity management activities, cathodic protection maintenance and repair, and replacement and maintenance of components such as regulators and valves (**Appendix B**). Major maintenance requiring surface disturbance could occur throughout the lifetime of the pipeline and could have potential impacts to habitat depending on the activity required. Activities considered major include repair or replacement of major facility elements such as cathodic protection systems, valves, and pipes. Additional maintenance includes ROW repair, below-grade pipe and coating inspections and repairs, maintenance/replacement of ground anode beds or cathodic protection rectifiers, installation of anode flex, and pipeline segment replacement. In the event of leaks, breaks, pipeline exposure due to erosion, and severe damaged cause by a severe storm or natural disaster, emergency repairs and leak excavation could occur. Pipeline leaks would involve equipment similar to that used for below-grade pipe and coating inspection or pipeline segment replacement.

Section 7 consultation for this Project is covered under the PBO (USFWS 2019) contingent on compliance with the terms and conditions. A copy of the terms and conditions has been provided for this Project (Sec 7 Log # NV-052-20-059).

3.8.4 Cumulative Impacts of the Proposed Action

Cumulative impacts for special status species are similar to those for wildlife discussed in **Section 3.7.4**. Cumulative impacts may be especially severe for Threatened and Endangered animal species, as they are more sensitive to even small changes in their populations or reproductive success than stable species. However, impacts would be reduced by all actions approved on BLM-administered land, which would follow the BLM PBO mitigation measures, as applicable.

3.8.5 Mitigation Measures

The Section 7 consultation for this Project is covered under the current PBO (USFWS 2019) contingent on compliance with the terms and conditions. A copy of the terms and conditions has been provided for this Project (Sec 7 Log # NV-052-20-059).

Mitigation Measures are included in Appendix C (Applicant Design Features) and Appendix D (BLM Standard Stipulations) of the EA.

3.8.6 Residual Impacts

Residual impacts would be similar for special status species as for other wildlife and plant species in the Project area. The lag time between vegetation removal and re-establishment would reduce high quality habitat in the area utilized by special status species. This lag-time length would depend on the life history traits of the reseeded vegetation species. Residual impacts would include edge effects and increased disturbance from off-road travel. Edge effects from the construction could result in increased disturbance resulting in habitat loss. Loss of habitat may result in the invasion of non-native plant species and reduce cover sites for desert tortoise. Standard stipulation and the desert tortoise terms and conditions should help decrease the likelihood of negative consequences from this action.

3.9 Visual Resources

3.9.1 Affected Environment

3.9.1.1. BLM Visual Resource Management

The BLM uses the visual resource management (VRM) system to identify and classify visual resources on BLM-administered as described in BLM Manual 8400 (BLM 1984). The VRM system classifies land based on visual appeal, public concern for scenic quality, and visibility from travel routes or observation points. The degree of visual modification allowed is specific for each VRM class. However, the goal of the VRM system is to minimize the visual impacts of all surface-disturbing activities regardless of the class in which they occur.

The Project area is located within several BLM-designated VRM Classes. These include Classes II, III, and IV as shown on **Figure 20; Appendix E**. The acreages within the four VRM Class within the LVFO Planning Area are listed in **Table 19; Appendix A**.

The objective for VRM Class II areas is to preserve the existing character of the landscape; therefore, the level of change to the characteristic landscape should be very low and must not attract attention. The objective for VRM Class III areas is to partially retain the existing character of the landscape; therefore, the level of change to the characteristic landscape should be moderate. The objective for VRM Class IV areas is to provide for management activities that require major modification of the existing character of the landscape; therefore, the level of change to the characteristic landscape can be high. Within a VRM Class IV area, management activities may dominate the view and be the major focus of viewer attention. Every attempt should be made to minimize the impact of these activities through careful location; minimal disturbance; and repeating the basic landscape elements of color, form, line, and texture for all VRM classes (BLM 2014).

3.9.1.2. Existing Landscape Character

No designated scenic trails, highways, or byways exist in or near the Project area; however, the Highland Range and the portions of the ACEC in McCullough Mountains contain exemplary scenic qualities due to dramatic relief, rugged nature of the landscape, and variation in color and texture. The topography within the Project area varies and ranges from valley floor elevations of around 1,150 feet near Laughlin/Bullhead City to mesas at around 2,500 feet and mountain elevations of more than 7,000 feet. The principal mountain ranges are the McCullough Mountains and Newberry Mountains. The broad valleys of the Basin and Range landscape trend generally north-south and can extend for more than 30 miles along this axis. With a typical width of 10 miles, these valleys afford panoramic vistas of the adjacent mountain ranges. The Project area is in the Mojave Desert with some influence in the transition zone to the Great Basin Desert and vegetation representative of the Sonoran Desert. The Project area is characterized by the Southern Clark County viewscape, which has a predominantly medium scenic quality, with some high and low scenic quality areas (BLM 2014).

Current and past human activities have resulted in changes to the existing landscape character. Current modifications to the landscape character include existing roads, pipelines, overhead powerlines, and solar farms and fences within the Project area. The existing colors of the landscape include tans and browns from the sandy soils and light and medium greens from the vegetation.

The existing pipeline alignment is visible from some segments of the Old Spanish Trail National Historic Trail; the Old Spanish Trail is discussed in detail in **Section 3.10.2**.

Most of the Project area is remote, rural, and isolated from major communities, and there are very few existing stationary light sources in the vicinity. Thus, the ambient light level in the Project area is low during the night, and the sky is considered to be very dark. The very low ambient light level allows visibility of astronomical features. Existing sources of artificial nighttime light in the vicinity of the Project area include traffic along existing roads, existing oil and gas facilities, and rural residences.

3.9.2 Visual Sensitivity

"Visual sensitivity" is a measure of public concern for scenic quality. Areas visible from many locations or at close range are more sensitive to modifications of the characteristic landscape. Tourists and recreationists make up large numbers of travelers on the major roads in the vicinity of the Project area. Areas of high visual sensitivity include the Piute/Eldorado and Keyhole Canyon ACECs, Ireteba Peaks Wilderness, the Old Spanish National Historic Trail, off-highway vehicle (OHV) recreation, and tourists traveling between Las Vegas and more remote areas (BLM 2014). In general, users of the Project area are accustomed to viewing pipelines, transmission lines, and associated facilities; however, visual quality is an important part of the recreational experience for many users. Recreationists who regularly visit the area are likely to value the scenic quality of the surrounding landscapes.

3.9.3 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no new direct or indirect impacts on visual resources would occur as a result of the Project.

3.9.4 Environmental Effects of the Proposed Action

Segments of the pipeline are partially located on private, state, or Boulder City- and County-administered lands that do not have a VRM designation. A total of 98.85 acres are partially located on BLM-administered lands designated as VRM Class II and may be visible to the public when traveling on State Highway 163. The objective for Class II VRM areas is to preserve the existing character of the landscape; therefore, the level of change to the characteristic landscape should be very low and must not attract attention. A total of 805.89 acres are partially located on BLM-administered lands designated as VRM Class III. The objective for Class III VRM areas is to partially retain the existing character of the landscape, and the level of change to the characteristic landscape should be moderate. A total of 39.34 acres are partially located on BLM-administered lands designated as VRM Class IV. Within Class IV VRM areas, moderate to major modification changes to the landscape are allowed.

During construction, long-term visual impacts to the color of the texture of the characteristic landscape would occur as a result of vegetation clearing and grading. In the short-term, the presence of workers, vehicles and vehicle lights, heavy equipment, the bustle of activities, and associated dust would detract from the visual quality of the landscape in the immediate vicinity of the proposed activities. Although slopes and vegetative screening would likely obscure direct views of some of the Project-related activities as seen from areas accessible to the public, at times, vehicle lights and dust raised by vehicle movements would be visible from publicly accessible locations. Some locations along the alignment are relatively remote and would be seen by a relatively small number of people.

The pipeline warning markers would cause minimal long-term changes to the viewshed, as there are currently warning markers for existing pipeline segments in or adjacent to the current ROWs.

For all three VRM classes in the Project area, the long-term visual impacts associated with the proposed Project would represent a minimal modification of the landscape relative to the surrounding landscape and are not expected to dominate the view of the casual observer.

Operations and Maintenance

Maintenance of the pipeline would occur periodically during operation, and trucks and equipment would be visible periodically.

3.9.5 Cumulative Impacts of the Proposed Action

The primary viewshed for the Project consists of the U.S. Highway 95 corridor and locations where the viewer could see the Proposed Action area as well as views of other projects. Compared to surrounding projects with large, permanent, aboveground structures, the impacts from the Proposed Action are minor. However, cumulative impacts may occur if the Project contributes to visual changes in the same areas and these changes are perceived by the public as a noticeable element. There are several existing and proposed industrial, manmade elements in the vicinity of the Project, which include solar farms and overhead electric transmission lines. The addition of the proposed Project would result in minor modification of the character of the landscape.

3.9.6 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.9.7 Residual Impacts

Long-term impacts should be minor and are contingent on the use of minimization and avoidance procedures to reduce disturbance during construction. Following restoration and successful revegetation of the Project-related disturbances, the pipeline ROW would represent a minimal long-term modification of the landscape and is not anticipated to dominate the view of the casual observer. The appearance of the ROW would be similar to that of existing conditions along the alignment.

3.10 Land Use and Access

3.10.1 Affected Environment

This section summarizes the existing land use resources, including recreation and special designation areas, within the Project area.

3.10.1.1. Land Status/Ownership

The existing pipeline ROW is located predominantly on public lands administered by the BLM. The existing pipeline crosses18 miles of BLM land, 0.9 mile of private property, 8.1 miles of land owned by the City of Boulder City, and 0.3 mile of NDOT ROW.

3.10.1.2. Land Use Regulations/Management

The Project is located within Piute-Eldorado Valley ACEC. The Sloan Canyon National Conservation Area (SCNCA), managed by the BLM, is approximately 1.5 miles west of the Project. The Project area does not include any national or state-designated or proposed wild and scenic rivers; national or state forests or nature preserves; designated natural, recreation, or scenic areas; or state, county, or local parks. There are no identified designated specialty crops, national or state forests, conservation land, scenic areas, or registered natural landmarks crossed by or within 0.25 mile of the Project ROW. The Project site is located in an unincorporated area of Clark County, Nevada. The private lands within Clark County are zoned Rural Open Lands (R-U) (CCDCP 2015).

3.10.1.3. Existing Land Uses

The existing land uses in the vicinity of the Project include rural residential, commercial, and industrial development, small site-type ROWs (e.g., communication sites, seismic exploration, and substations), linear ROWs (e.g., roads, transmission, fiber-optic, and gas lines), renewable energy projects, and dispersed recreation.

Recreation

There are no developed recreational areas in the vicinity of the Project. BLM-administered lands within and adjacent to Project area are available for dispersed recreation. Recreational uses include biking, motocross, hiking, hunting, camping, four-wheel use, sightseeing, night racing, and rockhounding, OHV, and all-terrain vehicle/utility terrain vehicle (ATV/UTV) use. Hunting (primarily upland bird and small game species) most commonly occurs during designated hunting seasons beginning mid-September through early February (NDOW 2019).

Designated recreation areas in the Project area include three BLM Special Recreation Management Areas (SRMAs) that provide for open space and trail connectivity with the local community, and competitive and permitted OHV events (BLM 2014). The Project is located within the Piute-Eldorado Valley ACEC. In the 2020 fiscal year there was 101,975 visitors to the Piute-Eldorado Valley ACEC (BLM 2020). Additional recreational opportunities in the vicinity

of the Project area also include historical mining resources, Newberry Mountains, Ireteba Peaks Wilderness Study Area, Eldorado Mountains, Keyhole Canyon ACEC, and dispersed recreation throughout the desert (BLM 1998).

Off-highway Vehicle and/or All-terrain Vehicle Use

An increasing number of OHV and ATV use is occurring throughout much of the Project area. The increasingly used networks of two-track roads and routes are creating conditions that have allowed OHV users and campers to expand surface disturbances within the area. Designated OHV areas on BLM lands are generally limited to designated trails unless on designated open areas. Within the Project area, OHV use is limited to designated routes or designated roads, trails, and dry washes (BLM 2014).

3.10.1.4. Special Designation Lands

Public lands with BLM Special Land Designations in the vicinity of the Project area are shown on **Figure 21; Appendix E**. An ACEC is defined as an area within public lands where special management attention is required to protect and prevent irreparable damage to important historical, cultural, and scenic values; fish and wildlife and other natural systems or processes; and life and safety from natural hazards. ACEC designation indicates that significant value or resources exist that must be accommodated for future management actions and land use proposals.

The Piute-Eldorado Valley ACEC was established in the 1998 RMP specifically for desert tortoise management within the Northeastern Mojave and Eastern Mojave recovery units of the Tortoise Recovery Plan (BLM 1998, 2014). Desert Tortoise are discussed in detail in **Section 3.8.1.1** of this EA. The ACEC meets the relevance and importance criteria, as it encompasses designated desert tortoise critical habitat and other suitable habitat not designated as critical. This ACEC also includes crucial habitat and winter range for bighorn sheep, which are discussed in **Section 3.7.1.1.1**. The RMP designates the ACEC as a ROW avoidance area except within existing utility corridors, imposes seasonal restrictions for activities such as off-road vehicle use, and requires temporary roads to be reclaimed. The Piute/Eldorado ACEC is located in the Piute and Eldorado Valleys between Boulder City and the Nevada-California state line and surrounds the communities of Searchlight and Cal-Nev-Ari.

Multiple existing BLM utility corridors cross the ACEC including designated utility corridors and existing ROWs. The BLM designs utility corridors to help reduce overall impacts to resources. Designation of corridors is also based on interest in having major pipelines, highways, and utility routes confined to ROW corridors to focus surface disturbances and protect other resources in adjacent areas.

Existing uses affecting habitat quality within the ACEC include unauthorized cross-country OHV use, highways, mining, utility corridors, and historical grazing activities. OHV use is currently authorized on designated routes only. Invasive weeds and grasses are becoming an increasing concern. The ACEC is bisected into four parts by U.S. Highway 95 and State Route 164 (BLM 2014). The diverse topography and vegetation may offer opportunities for desert tortoise populations to survive should climate changes occur. Approximately 828 miles of roads are designated within this ACEC in addition to the highways.

Three other ACECs are located within 15 miles of the Project area. The Keyhole Canyon ACEC is approximately 1.4 miles east of the existing alignment in the Nelson Hills and contains

archaeological and cultural resources including prehistoric habitation and cave art. The River Mountains ACEC and Rainbow Gardens ACEC are located approximately 4 and 7.6 miles from the proposed alignment (respectively) in Henderson. The River Mountains ACEC contains critical desert bighorn sheep habitat and is a scenic viewshed for Henderson and Boulder City (BLM 1998). OHV use, shooting, and dumping are increasing issues in this ACEC. The Rainbow Gardens ACEC contains important geological, scientific, scenic, cultural, and sensitive plant resources and is close to Boulder City (BLM 2014). The draft 2014 RMP revisions do not nominate any additional ACECs within 15 miles of the Project area.

3.10.1.5. Historical

Designated National Historic Trails in the Project area include the Old Spanish Trail. The existing pipeline ROW crosses the Old Spanish Trail multiple times. The Old Spanish Trail is co-administered by BLM and National Park Service (NPS), and a trail-wide comprehensive plan is being prepared by both agencies.

3.10.1.6. Special Designation Lands

BLM-designated SRMAs are areas that often have high levels of recreation activity, contain valuable natural resources, or require recreational settings that need special management. SRMAs are managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics (BLM 2014). Designated recreation areas in the Project area include three BLM SRMAs: the Las Vegas Valley SRMA, Nelson/Eldorado SRMA, and Laughlin SRMA. The Las Vegas Valley SRMA was established for open space and trail connectivity with the local community and is closed for OHV use; the Nelson/Eldorado and Laughlin SRMAs are managed for competitive and permitted OHV events, respectively (BLM 2014). SRMA management designation encourages preservation of recreational opportunities and requires other uses to be compatible with the intended recreation uses.

3.10.1.7. Access

Major roads in the proposed Project area include Laughlin Highway/Route 163, Nipton Road/Route 164, U.S. Highway 95, and Interstate 11. Existing pipeline and electrical transmission ROW access roads, state highways, local roads, and BLM roads also provide access to the Project area. In the vicinity of Searchlight, multiple local roads provide access to the portion of the existing ROW on private lands. On the southern terminus, the Project is accessible from the Needles Highway as well as existing pipeline and transmission access roads.

The existing pipeline ROW crosses numerous local roads including Christmas Tree Pass Road, Loran Station Road, Golden Rod Snyder Road, Laughlin Highway/Route 163, Nipton Road/Route 164, U.S. Highway 95, and numerous additional unnamed roads. Existing maintained dirt pipeline access roads provide access the entire length of the existing pipeline.

Table 20 (**Appendix A**) summarizes the annual average daily traffic for the primary roads providing access to the Project area.

3.10.1.8. Wilderness

No designated Wilderness Areas, WSAs, or LWCs are present in the Project area. There are no Wilderness Areas within 50 miles of the Project area. The nearest WSA is approximately 52

miles from the northern tip of the proposed alignment. The nearest LWC (NV-050-0436) is located west of Searchlight, approximately 813 feet from the proposed alignment.

3.10.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no direct or indirect impacts to land use resources would occur as a result of the Project.

3.10.3 Environmental Effects of the Proposed Action

3.10.3.1. Recreation

The Project would have no direct or indirect impacts to developed recreational facilities because there are none within the Project area. There are three BLM-designated SRMAs within the Project area: the Las Vegas Valley SRMA, Nelson/Eldorado SRMA, and Laughlin SRMA. The proposed pipeline alignment will cross 8.37 miles and impact 178.69 acres of these SRMAs. Temporary trail or partial area closures may occur during construction of the proposed Project; however, each SRMA would be restored to pre-construction conditions upon completion of each Project phase. Project-related construction activities are not anticipated to result in long-term impacts to the SRMAs.

To protect public safety during construction, the public would not be allowed access to the construction ROWs. No Project-related impacts to the safety of individuals using BLM-administered lands for dispersed recreation, including the local SRMAs, are anticipated.

During construction, a total of 1.012.61 acres of BLM-administered lands within the Project area, including portions of the SRMAs, would be unavailable for dispersed recreational uses. Short-term trail closures or temporarily rerouted trails may be associated with construction during all phases of the Project. Temporary detours or closures of designated camping or hunting areas may also occur. Recreational areas in the vicinity of the Project would be accessible via other access routes. Construction may result in short-term, indirect impacts, which would detract from the recreational experience in the immediate vicinity of the proposed activities. Indirect impacts may include the sights and sounds associated with the presence of workers, vehicles and vehicle lights, heavy equipment use, the bustle of activities, and associated dust during construction.

No long-term impacts to existing recreational uses, including OHV and/or ATV use, camping, biking, sightseeing, or other recreational activities, are anticipated to occur from the Project. No permanent closure or reroutes of recreational trails or areas would occur.

3.10.3.2. Special Designation Lands

Of the three Project phases, Phase I and Phase III are anticipated to have a portion of workspace located within the Piute-Eldorado Valley ACEC, which is designated as critical habitat for the Mojave desert tortoise. Portions of this ACEC are also designated as crucial habitat and winter range for the bighorn sheep.

Of the approximately 27.3 miles of the proposed pipeline alignment for Phase I, a total of 12.87 miles would be located within Piute-Eldorado Valley ACEC. The Project area within the ACEC consists of 248.26 acres and Phase I would include approximately 213.75 acres of temporary removal of vegetation and ground disturbances within the Piute-Eldorado Valley ACEC. Of the approximately 13.29 miles of the proposed pipeline alignment for Phase II, none of the construction-related ground disturbance would be located within the Piute-Eldorado Valley

ACEC; therefore, there would be no direct impacts to this ACEC. Of the approximately 28.9 miles of the proposed pipeline alignment for Phase III, a total of 20.77 miles would be located within the Piute-Eldorado Valley ACEC. the Project area within the ACEC consists of 445.16 acres and Phase III will include approximately 354.81 acres of temporary removal of vegetation and ground disturbance within the ACEC.

Operations and Maintenance

Operations and maintenance would have temporary impacts on land use and access. Operations and maintenance would result in additional traffic within the ACEC, which could introduce weeds or spread weeds within the ACEC. SWG would implement BMPs described in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) to minimize impacts.

3.10.4 Cumulative Impacts of the Proposed Action

Cumulative impacts on land use and access would result from current and reasonably foreseeable projects in the vicinity of the Proposed Action. Multiple energy projects have and are currently being constructed on BLM land adjacent to the Project area. Several of the projects use the same access roads and utility corridors. If project activities occurred at the same time as the Proposed Action, road closures from construction may impact recreational activities to a larger extent than the Proposed Action alone.

Additionally, continued and persistent activity within ACECs due to the Proposed Action and other project activities in the vicinity would further degrade critical habitat for special status species including the desert tortoise and bighorn sheep.

3.10.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.10.6 Residual Impacts

Residual impacts include potential spread of invasive species throughout the ROW and into the surrounding ACEC. Minimization of the residual impacts are contingent on the adherence to BMPs and minimization techniques to avoid significant impacts on special designation land use areas.

3.11 Cultural Resources

3.11.1 Affected Environment

This section summarizes cultural resources associated with the Project area including prehistoric, historical, and previously researched areas.

3.11.1.1. Prehistoric Context

Southern Nevada is culturally in an area of transition between the Great Basin and the Desert Southwest. Prehistoric cultural materials encountered in this general area have generally been consistent with the Mojave Desert Chronology. In the latter chronology, prehistoric cultural materials are classified into five broad cultural periods: Lake Mojave/Pre-Archaic (12,000 to 7,000 years ago); Pinto/Early Archaic (7,000 to 4,000 years ago); Gypsum/Middle Archaic (4,000 to 1,500 years ago); Saratoga Springs/Late Archaic (1,500 to 800 years ago); and Ethnohistoric (800 to 400 years ago). These cultural periods are distinguished by distinctive

diagnostic artifacts including but not limited to projectile points. They are also characterized by gradual trends in adaptive strategies over time. The Ethnohistoric Period is based on projections backwards in time from ethnographic and historical accounts and is presumed to be comparable to the cultural patterns that characterized the area at the time of European contact. The earliest historic descriptions of the native inhabitants of this region include Spanish descriptions from the later Alta California mission period including the account of Francisco Garcés in 1776, and the account of Francisco Dominguez and Silvestre Escalante, also written in 1776. By that time, there had been Spanish incursions and localized settlement into what would become the American Southwest for more than two centuries. The observations of the friars indicate that Spanish settlement and missionization had limited impact on native populations in this region.

In the accounts of early European contact, southern Nevada was occupied by Chemehueve and various bands of Southern Paiute. Existing Tribes that claim traditional ties to the area are (Arizona State Historic Preservation Office [SHPO] and Salt River Pima-Maricopa Indian Community 2017):

- Chemehueve Indian Tribe
- Colorado River Indian Tribes
- Fort Mojave Indian Tribe
- Hualapai Indian Tribe
- Kaibab Band of Paiute Indians
- Las Vegas Tribe of Paiute Indians
- Moapa Band of Paiute Indians
- Paiute Indian Tribe of Utah.

3.11.1.2. Historic Context

The Spanish missions in New Mexico made several expeditions in the late 1700s and early 1800s to establish a route from New Mexico to their missions in southern California. Spanish missionaries, fur trappers and traders, and immigrants passed through the area sporadically until the 1850s, many of them following the route of the Old Spanish Trail. Three routes of the Old Spanish Trail pass through Clark County: 1) the Armijo route established in 1829; 2) the northern route established in 1831; and 3) the southern route, part of which is roughly followed by U.S. Highway 95 (BLM and NPS 2012). The southern route, also known as the Mojave Road, is not attributed to any particular trader or explorer. This trail was a pack trail not considered suitable for wagons. Traditional trails and early wagon roads were not fixed tracks like later improved roads but were braided across the countryside in response to varying conditions. The Mojave Road route was used almost entirely by pack trains, and small cattle herds left even more dispersed traces. U.S. Highway 95, from Boulder City south to State Route 163, largely parallels portions of the southern route of the Old Spanish Trial. U.S. Highway 95 became part of the U.S. highway system in the 1940s.

The Project crosses through portions of several mining districts that were active in the late 1800s and early 1900s. These include the Alunite, Searchlight, and Newberry Mining Districts. Many of the prospects, mines, and associated sites are in the hills away from the pipeline, but the

pipeline passes through a portion of the Searchlight Mining District, where there are many abandoned mines and mining-related sites.

3.11.1.3. Previous Studies and Known Resources

A record search was completed for the Project corridor and a 0.5-mile radius (record search area) through the Southern Nevada Archaeological Archive in Las Vegas. Historic topographic maps of the route were also reviewed for evidence of historic sites that may not be recorded. The initial record search yielded 84 previous reports and 118 previously documented sites. The initial search did not include recent, in-process reports and forms. There were 21 previous reports within the past 20 years (1997 and later), which included one mitigation report, one monitoring report, one Class II sample of hazardous abandoned mines, and one sampling design. The previously recorded cultural resources in the records search area included four prehistoric sites eligible for the NRHP, 17 unevaluated prehistoric sites, three eligible historic sites, 16 unevaluated historic sites, and four unevaluated sites with both prehistoric and historic components. A total of 44 potential historic properties were identified in the record search area. Many of the ineligible resources were isolated artifacts or features. Many of the historic resources were mining-related materials and features in the Searchlight Mining District.

3.11.1.4. Class III Cultural Resource Inventory

A Class III Cultural Resource Inventory (#5-2803) was conducted for the Project direct area of potential effect (APE; Arcadis 2019b). The direct APE is defined as the proposed Project footprint plus 15 meters (approximately 50 feet) in all directions. The inventory identified 22 newly discovered sites, 23 previously recorded sites in or near the Project boundary, and 27 isolated finds. From this total, eight of the 23 previously recorded sites were found and seven updated. The SWG existing pipelines are included in the newly discovered sites, which the L- and R-pipelines are considered historic natural gas pipelines. In addition, the Mojave Road of the National Historic Old Spanish Trail is previously recorded as intersecting at four points in the Project area, but no material evidence of this trail was encountered during the survey. The BLM determines that the 22 new cultural sites are ineligible for the NRHP, including the SWG pipelines. From the seven previously identified sites, three were originally recommended as eligible. The BLM determines that six of the previously identified sites are NHRP ineligible and the Boulder Dam-San Bernardino Transmission Line that crosses into the Project area is a non-contributing segment to the overall NHRP eligibility of the line.

3.11.2 Environmental Effects of the No Action Alternative

In the absence of the Proposed Action, no direct or indirect impacts to cultural resources would occur as the result of Project activities.

3.11.3 Environmental Effects of the Proposed Action

The existing pipelines are historical pipelines associated with early expansion of natural gas pipelines in Nevada. The Advisory Council on Historic Preservation (ACHP) 2002 pipeline exemption requires that, if these pipelines are to be abandoned in place, they be documented and evaluated for eligibility as historic features. If the documented pipelines are evaluated as eligible, they would be exempt from consideration of adverse effects.

Elements of previously documented sites recommended as eligible are at the edges of or completely outside areas of proposed Project disturbance and can be easily avoided by construction. As a result, there would be minimal to no impacts to cultural resource sites.

Operations and Maintenance

Operations and maintenance would occur within the ROW and therefore would result to minimal or no impacts to cultural resources.

3.11.4 Cumulative Impacts of the Proposed Action

Cumulative impacts to cultural resources would occur if multiple projects damaged or disturbed known or unknown cultural artifacts in the Project area. The Proposed Action would take precautions to avoid any disruption to cultural resources; therefore, cumulative impacts from the Project are not expected.

3.11.5 Mitigation Measures

Mitigation Measures are included in **Appendix C** (Applicant Design Features) and **Appendix D** (BLM Standard Stipulations) of the EA.

3.11.6 Residual Impacts

Residual impacts would result from the permanent loss of cultural resources. These impacts are contingent on the adherence to the discussed BMPs and avoidance measures.

Chapter 4 Consultation and Coordination

4.1 Scoping and Public Participation

In May 2019, SWG sent a letter to stakeholders notifying them of the Proposed Action and solicited comments. The letters were sent to NDOT, NDOW, City of Henderson, Boulder City, Clark County, and Laughlin and Searchlight Town Advisory Boards. No specific comments were received, but SWG was invited to present at the Laughlin and Searchlight Town Advisory Board meetings on July 9, 2019 and July 10, 2019, respectively.

A Draft EA will be made available on the BLM National NEPA Register for a 30-day public review and comment period.

4.2 Summary of Consultation

In accordance with Section 7 of the ESA, BLM initiated consultation with the USFWS for the entirety of the Project (Phase I, II, III) to append this Project to the BLM PBO. If the disturbance acreage is reduced further before issuance of the Notice to Proceed (NTP) than analyzed in this EA, then the BLM would amend the consultation with USFWS to capture the updated disturbance acreage. BLM also consulted with the Clark County Desert Conservation Program on extending BLM and USFWS extending the PBO to non-federal lands.

BLM consulted with the SHPO in October 2020 and determined that the Project is under-threshold and will not require SHPO review. The BLM submitted the Cultural Resource Report (Arcadis 2019b) to SHPO for incorporation into the Statewide Inventory.

Tribal consultation letters were mailed from the BLM on October 5, 2020 to the Fort Mojave Indian Tribe, the Las Vegas Tribe of Paiute Indians, the Moapa Band of Paiute Indians, Twenty-Nine Palms Band of Mission Indians, Chemehuevi Indian Tribe, and Colorado River Indian Tribes (CRIT). The letter was followed by e-mails from the BLM on October 15, 2020 and November 16, 2020. On November 18 and 20, 2020 the Fort Mojave and the Colorado River Indian Tribes respectively contacted the BLM to express tribal interest in the Project and requested having a tribal monitor present for the Project and asked to review the Cultural Resource Report. A cultural resource summary was submitted to the Tribal Historic Preservation Officer (THPO) of the Colorado River Indian Tribes in advance of the Cultural Resources Report, who did not have any preliminary comments. BLM reached out to Fort Mojave by phone calls and emails on December 29, 2020, as well as a January 8, 11, 19, 22, 25, and February 9, 2021 to confirm that Fort Mojave remains interested in providing a formal response. BLM has not received a formal response from Fort Mojave.

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APPENDIX A

TABLES

Table 3 Federal, State, Local Permits, Authorizations, and Interagency Consultations

Administering Agency	Permit, Approval, or Clearance	Applicability
BLM, Las Vegas Field Office	ROW Application (SF-299)	A ROW application is required to carry out construction activities on public land. A ROW grant is an authorization to use a specific piece of public land for a specific project. Generally, a ROW is granted for a term appropriate for the life of the project.
	Section 106 of the National Historic Preservation Act, Consultation	As per the National Historic Preservation Act, Section 106 consultations are required when a project involving federal action, approval, or funding may affect properties that qualify for the National Register of Historic Places.
U.S. Department of Army Corps of Engineers (USACE), Sacramento District	Section 404 of the Clean Water Act, Nationwide Permit 12	Section 404 permitting is required for any impacts to waters of the U.S. (WOTUS), including jurisdictional wetlands, that could result in the discharge of dredged or fill materials into a waterbody or wetland. Nationwide Permit 12 (a general permit) is required for all utility line activities. A pre-construction notification (PCN) may be required.
U.S. Department of Interior, Fish and Wildlife Service (USFWS), Las Vegas Field Office	Section 7 of the Endangered Species Act, Informal/Formal Consultation	Any activity, such as displacement or habitat disturbance, that may affect listed or proposed Threatened and Endangered species.
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS), Las Vegas Service Center	Revegetation Seed Mix Consultations	Restoration seed mixes must be developed with the NRCS in order to restore disturbed work areas to their pre-construction states using native or non-invasive vegetation.
Public Utilities Commission of Nevada (PUCN)	Nevada Utility Environmental Protection Act (UEPA) Permit to Construct	Nevada Revised Statute 704.865 requires that any person, other than a local government, constructing a utility facility in the State of Nevada must obtain a UEPA permit from the PUCN. This process is meant to balance the potential environmental impacts of a proposed utility with the public interest served by such a facility. SWG is exempt from the UEPA process because SWG is replacing an existing facility with a like facility.
Nevada Division of Environmental Protection (NDEP) - Bureau of Water Pollution Control	Section 402 of the Clean Water Act, Temporary Discharge Permit[1]	This permit is required to cover discharges from dewatering and other discharges of a temporary nature that require immediate action. It is required before any discharge that may affect, directly or indirectly, WOTUS.
	Temporary Working in Waterways Permit	This permit is required to cover temporary working or routine maintenance in surface waters of the state. This is required before operating earth-moving equipment in any body of water.
	Construction Stormwater Discharge General Permit (National Pollution Discharge Elimination System [NPDES] Permit)	This permit is required for certain activities that discharge stormwater to WO TUS in order to reduce pollutants to WOTUS.
NDEP - Bureau of Water Quality Planning	Section 401 of the Clean Water Act, 401 Water Quality Certification	This certification is required for all activities requiring a federal permit to allow discharges or dredged or fill material to WOTUS.
Nevada State Historic Preservation Office (SHPO)	Section 106 of the National Historic	As per the National Historic Preservation Act, Section 106 consultations are required when a project involving federal action, approval, or funding may affect properties that qualify for the National Register of Historic Places.

Table 3 Federal, State, Local Permits, Authorizations, and Interagency Consultations

Administering Agency	Permit, Approval, or Clearance	Applicability
	Preservation Act, Consultation	
National Trails Intermountain Region, Old Spanish National Historic Trail	Consultation	Consultation should be provided to the National Historic Trails Association describing potential impacts to nearby trails and allowing the Agency to submit any comments.
Nevada Department of Wildlife (NDOW)	Consultations on sensitive species and habitats	Consultation with NDOW is required to determine if any state-listed Threatened or Endangered species are likely to be impacted by the project activities.
NDOW	Energy Planning and Conservation Fund	NDOW requires the owners/applicants of all proposed energy projects (of applicable size) to file a notice (application) and provide an initial fee to NDOW for evaluation of the project. Additional fees may be required depending on the scope of the project.
Nevada Natural Heritage Program (NNHP)	Consultations on sensitive species and habitats	List of Threatened and Endangered species and critical habitat that may occur in the project location and may be affected by project activities.
NDOT	ROW Occupancy Permit, permanent encroachment/ ROW	The NDOT grants permits for permanent installations within state ROWs and in areas maintained by the state. Installations requiring occupancy permits include utility installations.
Clark County Public Works	Consultation	A project description notifying the County of the proposed project.
Clark County Department of Air Quality (DAQ)	Dust Control Permit	Regulates construction activities that disturb soil in Clark County, Nevada. A Dust Control Permit for Construction Activities (Dust Control Permit) is required for soil-disturbing projects greater than 0.25 acre.
Boulder City	Consultations	A project description notifying Boulder City of the proposed project.
Bullhead City	Consultations	A project description notifying Bullhead City of the proposed project.
City of Henderson	Consultations	A project description notifying the City of Henderson of the proposed project.
Fort Mojave Indian Tribe	Tribal Consultations	For proposed actions with potential impacts on Tribes, regulations implementing NEPA require an Agency to consult with Tribes.
Kaibab Band of Paiute Indians	Tribal Consultations	For proposed actions with potential impacts on Tribes, regulations implementing NEPA require an Agency to consult with Tribes.
Las Vegas Tribe of Paiute Indians	Tribal Consultations	For proposed actions with potential impacts on Tribes, regulations implementing NEPA require an Agency to consult with Tribes.
Moapa Band of Paiute Indians	Tribal Consultations	For proposed actions with potential impacts on Tribes, regulations implementing NEPA require an Agency to consult with Tribes.
Paiute Indian Tribe of Utah	Tribal Consultations	For proposed actions with potential impacts on Tribes, regulations implementing NEPA require an Agency to consult with Tribes.

Notes:

1 A Temporary Discharge Permit is typically not required for the discharge of dust control water obtained from an established well source. Similarly, the discharge of hydrostatic test waters as dust control, when that water is obtained from an established well source, does not require a Temporary Discharge Permit. A Temporary Discharge Permit may be required for the discharge of groundwater, which may be encountered during trenching, as dust control. A Temporary Discharge Permit may also be required if hydrostatic test waters (or other waters) are to be discharged in higher volumes, such as into a dewatering structure.

Table 4 Existing BLM Authorizations, Diameter, and Length

BLM Serial Number	Diameter (inches)	Length (miles)
NEV-043645	16	36.61
NEV-043646	16	18.91
NEV-060166*	10.75	3.67
N-7841	12.75 and 16	59.28
N-15814*	10.75	52.73
N-25616	10.75 and 16	1.09
N-53117	20	5.76
N-54045	24	4.7
N-60005	16	12.9

Notes:
* Pipeline is no longer used and is abandoned in place.

Table 5 Past, Present, and Reasonably Foreseeable Future Actions in Cumulative Effects Areas

STS Phase	Project Name	Relation to STS	Description	Footprint	Status
1	Boulder Dam-San Bernardino Transmission Line	Crosses pipeline corridor southwest of Dry Lake near the corner of 24S/63E Sections 29, 30, 31, 32	Historic transmission line and at least two subsequent transmission lines follow the same utility corridor from the CA state line to Hoover Dam	Unknown	Built 1930
1	Mead-Davis-Parker 230 kV Transmission Line	Transmission line generally parallels pipeline for more than 35 miles from the southern part of T25S R63E to T32S R64E S 12, where it turns east to Davis Dam	140-mile transmission line from Boulder City, NV to Parker Dam, AZ by way of Davis Dam, NV	Unknown	built mid-1970s
2	Eldorado-Kaiparowits Transmission Line	Predominantly north of the pipeline, but includes a segment in the Dutchman's Pass area	Extensive transmission line including segments in existing utility corridors	Unknown	late 1970s
1	Victorville-McCullough Transmission Lines 1 and 2	Crosses pipeline south of Dry Lake in same corridor as Boulder Dam-San Bernardino transmission line	Conversion of existing 287 kV Transmission line to 500 kV along a 162-mile ROW from McCullough Switching Station to Victorville, CA. Minimal new disturbance	Unknown	1980
2	Navajo-McCullough Transmission Line	Crosses pipeline south of Dutchman's Pass and parallels the pipeline for ~3 miles to south	Approximately 100 miles of 500 kV transmission line extending north from McCullough Switching Station through northern Clark County and into Lincoln County	Unknown	1981
2	Intermountain Power Association Adelanto Line	Crosses the pipeline ~0.8 mile south of Dutchman's Pass. Portions of corridor parallel the Navajo-McCullough line	85-mile corridor extends north-northeast from Eldorado Junction to southwest Utah	Unknown	1983
1	Material Locations for US 95 North of Searchlight	Just east of US 95 and just ~9 to 11 miles north of Searchlight	Three material sources along US 95 ROW north of Searchlight	360 acres	1983
1	Mead-Phoenix 500 kV Direct Current Transmission Line	Crosses pipeline ~1 mile south of Dry Lake in same corridor as Boulder Dam-San Bernardino and Victorville-McCullough Transmission Lines	243-mile 500 kV DC transmission line from Mead Substation southwest of Boulder City northeast and then southeast into Arizona	Unknown	late 1980s
3	Forty-acre Material Pit near Laughlin	0.4 mile southeast of Intersection Point Station near east end of line	40-acre material pit	40 acres	1986
1,2	19-mile Gas Pipeline ROW in the Eldorado Valley	Along the pipeline corridor from the McCullough Range west of Dry Lake and SSE to NW of Searchlight (T24S R62E S6 NW/NE to T27S R63E S 3 NE/SW)	Two new pipelines - one on each side of the SWG existing pipeline	~346 acres	1991

Table 5 Past, Present, and Reasonably Foreseeable Future Actions in Cumulative Effects Areas

STS Phase	Project Name	Relation to STS	Description	Footprint	Status
	McCullough-Arden 230 kV Transmission Line	Parallel and ~1 to 2 miles west for pipeline from Dutchman's Pass to southwest of Dry Lake	New transmission line	581 acres	1991
	14-mile Powerline ROW in the Eldorado Valley	Crosses pipeline ~0.5 mile south of southern tip of Dry Lake in same corridor as Boulder Dam-San Bernardino, Mead-Phoenix, and Victorville-McCullough Transmission Lines	New transmission line	339 acres	1992
2	Valley Electric Association Boulder City to Pahrump Powerline	Crosses pipeline on Boulder City land in 24S/63E S 18 northwest of Dry Lake	88-mile by 100-foot transmission line corridor	1067 acres	1994
	Eldorado-Ivanpah Transmission Line	Ends at Eldorado Valley Substation about 2 miles west of pipeline. The original line was associated with the Boulder Dam-San Bernardino Transmission Line	Replace major portion of 115 kV transmission line built in 1930s with 230 kV transmission line from Ivanpah Substation, San Bernardino County, CA to Eldorado Substation, Clark County, NV	~50 miles	2011
2	Techren Boulder City Solar	Spans pipeline west of Dry Lake and extends to northeast along northwest side of Dry Lake	Extensive solar generation facility.	2,200-acre solar generation facility and 4.6 mile transmission line	2014
2	Copper Mountain North Solar Project	Spans pipeline ~1.7 miles west of Dry Lake. Solar facility and infrastructure extend to the northeast and additional infrastructure extends to the southwest	Extensive solar generation facility and infrastructure	1,400-acre solar site plus 1,490 acres of infrastructure including transmission lines and generation tie-ins	2014
	KOWEPO America Townsite Solar Project	Solar site is ~2 miles northeast of pipeline and east of US 95 north of Dry Lake. The main transmission line crosses the pipeline west of Dry Lake	884-acre solar site and associated transmission lines and infrastructure along the same utility corridor as the Valley Electric Boulder City-Pahrump Transmission line	884-acre solar site and ~360 acres of corridor for infrastructure	2014
	Komipo Boulder Solar Project	The solar facility is located on the southwest half of Dry Lake and spans the STS to the west of Dry Lake	Project includes a solar generation facility on 1,550 acres of private land and a transmission line to connect to the grid on BLM land	Unknown	2014
	Searchlight Wind Energy	Spans the STS approximately 1.6 miles northwest of Searchlight	A wind generation facility on 210 acres of private land	Unknown	2001
	Ivanpah Power Generation Project	The transmission line crosses the STS south of Dry Lake, most of the project elements are in a	The entire project includes a power plant, a substation, and 64 miles of transmission line	Unknown	2003

Table 5 Past, Present, and Reasonably Foreseeable Future Actions in Cumulative Effects Areas

STS Phase	Project Name	Relation to STS	Description	Footprint	Status
		large utility corridor shared by several other transmission lines west of the pipeline	and access corridors running from Mead Substation to six miles east of Jean, NV		
	Harry Allen to Mead 500 kV Transmission Line	Approaches the east side of the STS south of Dutchman's Pass and crosses again north of Dry Lake	Approximately 48 miles of transmission line from the Harry Allen Substation northeast of Las Vegas southerly around the east side of Henderson to Dutchman's Pass, then east to the Mead Substation south of Boulder City	Unknown	2004
2	Mead/McCullough-Victorville/Adelanto Transmission	Runs south from Mead Substation along the west edge of the Newberry Mountains east of the STS	243 miles of transmission line realignment, primarily in Arizona	Unknown	1986
	Techren Solar Expansion DOI-BLM-NV-S010-2018-0017-DNA	On northwest side of Dry Lake adjacent to the pipeline	Expansion of infrastructure associated with the Techren Solar generating facility including1,600-foot extensions of paved access and water pipelines, tortoise fencing along roads, and a 2,600-foot buried pipeline to the Nevada Solar One Substation	Unknown	2018
3	2017 Laughlin/Logandale DOI-BLM-NV-S010-2017-0128-EA	The Laughlin races would occur east of the Piute Valley in the southern Newberry Mountains	Permit to use BLM land in the Laughlin and Logandale areas for high-speed motorcycle and quad races	Unknown	2017
1,2	City of Boulder City Water Line DOI-BLM-NV-S010-2016-0120-EA	East of the pipeline from south of the junction of US 93 and 95 south-southwest to about 5 miles east of Copper Mountain Solar	29,676 feet (5.6 miles) of new waterline in existing ROW	Right-of-way ~34 acres	2018
2	Boulder City By-Pass Railroad Pass Casino DOI-BLM-NV-S010-2016-0117-CX	Along US 93 at Boulder City Bypass about 3 miles east of Dutchman's Pass	Relocation of overhead powerline to underground outside the ROW of the Boulder City Bypass	Short-term ROW 3.19 acres	2016
2	WC Quarry Investments Split Estate Mineral Material Contract DOI-BLM-NV-S010-2016-0103-EA	About 3.5 miles east of pipeline, east of McCullough Range and west of US 95 near US 93 interchange - T23S R63E S 15, 22	Mineral material contract	Unknown	2017
2	Grassmeier Abandoned Mine Lands Reclamation	Approximately 0.2 mile west of the APE near Dutchman's Pass	Reclamation of an abandoned mill site	Unknown	2016

Table 5 Past, Present, and Reasonably Foreseeable Future Actions in Cumulative Effects Areas

STS Phase	Project Name	Relation to STS	Description	Footprint	Status
	DOI-BLM-NV-S010-2016-0099-CX				
3	SWG Pipeline Underground Pipeline/Regulator Station DOI-BLM-NV-S010-2016-0038-CX	Extending west from project pipeline toward US 95 northeast of Cal-Nev-Ari	Installation of ~1.6 mi. of 4-inch natural gas pipeline and a regulator station	5.6 acres	2016
2	Boulder City By-Pass DOI-BLM-NV-S010-2015-0133-CX	T23S R63E Sections 2 and 11. About 3 miles east of pipeline near US 93.	663 feet and 150 feet of new electrical conduit in 30-foot ROW at two locations	<0.6 acre	2016
2	Boulder Solar Transmission Line to Nevada Solar One Substation DOI-BLM-NV-S010-2015-0123-DNA	About 6 miles east of pipeline near Dry Lake T24S R63E S 30, 31 and T25S R63E S 6	2.3 miles of 230 kV overhead transmission line and parallel paved road plus a 0.3-mile paved access road and adjacent waterline from US 95	~9 acres	2015
	Copper Mountain DOI-BLM-NV-S010-2014-0140-DNA	About 3 miles east of pipeline north of SR 165 at US 95	Underground power line to Copper Mountain Solar 3	~0.7 acre	2014
	Eastern Nevada Transmission Project DOI-BLM-NV-S010-2009-1014-EA	Extends north and east from Henderson about 4 miles northeast of the Horizon Ridge PLS	33 miles of 230 kV transmission line from Newport Substation to Silver Hawk Substation and 21 miles of 230 kV transmission line from Gemmill Substation to Tortoise Substation	42/26 acres, respectively	2016
	Crescent Peak Wind DOI-BLM-NV-S010-2017-0109-EIS	10 miles west of Searchlight and west of pipeline	Up to 500MW wind energy generation facility extending to west	Four turbine sites in a 22-mile by 5-mile (32,531 acre) area on public land	In planning; NOI for EIS 2018
	Copper Mountain Solar 5	Spans pipeline ROW south of Dry Lake near Eldorado Valley Drive	Expansion of Copper Mountain South Solar to south	1,116 acres	In planning

Table 6 2014 Clark County, Nevada Annual Air Emissions

Pollutant	Emissions (tons/year)
Sulfur Dioxide (SO_2)	7,165
Particulate matter (PM) with a nominal aerodynamic diameter of 10 microns or less (PM_{10})	31,973
PM with a nominal aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$)	11,432
Nitrogen Oxides (NO_x)	48,711
Carbon Monoxide (CO)	305,637
Ammonia (NH_3)	1,485
Volatile Organic Compounds (VOCs)	185,150

Source: USEPA 2018

Table 7 National and State Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS (µg/m³)	
		Primary	Secondary
SO_2	Annual[1,11]	80	--
	24-hour[2,11]	365	--
	3-hour[2]	--	1308
	1-hour[3]	196	--
PM_{10}	24-hour[4]	150	150
$PM_{2.5}$	Annual[5]	12	12
	24-hour[6]	35	35
NO_2	Annual[1]	100	100
	1-hour[7]	188	--
CO	8-hour[10,13]	10,500	10,500
	8-hour[10,14]	7,000	7,000
	1-hour[2]	40,500	--
O_3	8-hour[8]	150	150
	1-hour[10,12]	195	195
Lead (Pb)	3-month[9]	0.15	0.15
Hydrogen sulfide[10]	1-hour	112	112

Notes:
NV Standards: Nevada Administrative Code (NAC) 445B.22907 Standards of Quality for Ambient Air: https://www.leg.state.nv.us/nac/NAC-445B.html#NAC445BSec22097

1 Not to be exceeded.
2 Not to be exceeded more than once per year.
3 Not to be exceeded by the 3-year average of the 99th percentile of the daily maximum 1-hour averages at each monitor within an area (equivalent to 75 parts per billion [ppb]).
4 Not to be exceeded more than once per year on average over 3 years.
5 Not to be exceeded by the 3-year average of the weighted arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors as determined in accordance with Appendix N to 40 CFR Part 50.
6 Not to be exceeded by the 3-year average of the 98th percentile 24-hour concentration as determined in accordance with Appendix N to 40 CFR Part 50.
7 Not to be exceeded by the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area (equivalent to 100 ppb).
8 Not to be exceeded by the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area determined in accordance with Appendix P to 40 CFR 50 (equivalent to 75 ppb).
9 Not to be exceeded by the maximum arithmetic 3-month mean concentration for a 3-year period as determined in accordance with Appendix R to 40 CFR Part 50.
10 NDEP standards.
11 Revoked per June 2, 2010 rule but in effect until 1 year after final attainment designations are in place for 1-hour SO_2 NAAQS.
12 Applies to the Lake Tahoe Basin, #90.
13 Applies to carbon monoxide less than 5,000 feet above mean sea level.
14 Applies to carbon monoxide at or greater than 5,000 feet above mean sea level.

Source: NAAQS (40 CFR Part 50). Note that some values have been converted from parts per million (ppm) or ppb to micrograms per cubic meter (µg/m³).

Table 8 Watersheds Crossed by Project

Crossed	County	Watershed
1.49 miles	Clark County	Las Vegas Wash (hydrologic unit code [HUC] 15010015)
32.59 miles		Ivanpah-Pahrump Valleys (HUC 16060015)
26.88 miles		Piute Wash (HUC 15030102)
8.54 miles		Havasu-Mohave Lakes (HUC 15030101)

Source: ArcGIS 2018

Table 9 Soils Map Units within the Project[a]

Soil Map Unit	Map Unit Name	Total Project Area (acres) on BLM-administered Land[b]	Project Area Ground Disturbance (acres) on BLM-administered Land
100	Newera association	39.22	30.27
110	Tenwell-Crosgrain association	15.74	13.79
111	Tenwell-Shamock association	142.33	117.79
112	Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes	0.05	0.05
120	Crosgrain-Tenwell association	80.07	65.81
141	Nipton-Haleburu-Rock outcrop association	33.10	29.54
151	Bluepoint-Arizo association	9.24	6.58
160	Lanip-Kidwell association	120.23	95.16
170	Tenwell-Lanip association	36.62	33.03
180	Kidwell-Tenwell association	121.49	90.94
380	Tonopah-Arizo association	90.72	
430	Bluepoint-Tipnat-Grapevine association		80.51
450	Arizo association	63.21	
455	Arizo-Tenwell association		55.54
470	Filaree-Seanna association	55.68	
532	Seanna-Goldroad-Rock outcrop association	19.31	48.41
591	Riverbend-Carrwash association		16.90
620	Arizo-Lanip association	67.27	
650	Peskah-Crosgrain association	55.06	
691	Hoppswell-Jetmine association	16.40	58.33
820	Newera-Rock outcrop association	25.70	47.85
910	Carrwash-Riverbend association	21.18	13.42
911	Carrwash association		23.09
	TOTAL	1,012.62	845.39

Notes:

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends in this table.

b The Project area represents the total acres of land used for the Project and includes existing permanent ROW, TUP/temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads on both BLM-Administered Land and Non-BLM Land.

c The Project area represents the total acres of land used for the Project and includes existing permanent ROW, TUP /temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads only on BLM-Administered Land.

d Project area ground disturbance consists of the portions of the Project area where vegetation would be removed and revegetated or where existing conditions would change. The Project area includes a number of existing roads on BLM and private land that would be utilized during construction resulting in no additional ground disturbance or improvements and/or change in existing conditions. As such, it is anticipated that those portions of the Project area that are currently used as existing roads would either not be disturbed or would not require restoration as they would remain as access roads consistent with current land use and vegetation.

e TUP/Temporary Easement Staging Area 1 would be used in Phase I and III. Acres of total Project Area associated with TUP/Temporary Easement Staging Area 1 is only included in Phase I. TUP/Temporary Easement Staging Area 8 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Staging Area 8 is only included in Phase I.

f TUP/Temporary Easement Access Road 1 would be used in Phase I and III. Acres of total Project area associated with TUP/Temporary Easement Access Road 1 is only included in Phase I. TUP/Temporary Easement Access Road 10 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Access Road 10 is only included in Phase I.

Table 10 Soil Types and Limitations within the Total Project Area on BLM Land

Soil Map Unit	Soil Map Unit Name	Acres within Total Project Area on BLM Land[a]	Prime Farmland	Drainage Class	Water Erosion Hazard	Wind Erosion Hazard[b]	Restoration Potential	Resistance to Compaction	Depth to Bedrock (cm)[c]	Severe Potential for Trench Caving[d]
100	Newera association	39.22	Not Prime Farmland	Somewhat excessively drained	Slight	Moderately Low	Slight	Low	15	No
110	Tenwell-Crosgrain association	15.74	Not Prime Farmland	Well drained	Slight	Moderately High	Slight	Moderate	56	No
111	Tenwell-Shamock association	142.33	Not Prime Farmland	Well drained	Slight	Moderately High	Slight	Moderate	56	No
112	Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes	0.05	Not Prime Farmland	Excessively drained	Slight	Moderately High	Slight	Moderate	>200	Yes
120	Crosgrain-Tenwell association	80.07	Not Prime Farmland	Well drained	Slight	Low	Slight	Moderate	28	No
141	Nipton-Haleburu-Rock outcrop association	33.10	Not Prime Farmland	Somewhat excessively drained	Moderate	Low	Moderate	Low	13	No
151	Bluepoint-Arizo association	9.24	Not Prime Farmland	Somewhat excessively drained	Slight	High	Slight	Moderate	>200	Yes
160	Lanip-Kidwell association	120.23	Not Prime Farmland	Well drained	Slight	Moderately Low	Slight	Moderate	>200	No
170	Tenwell-Lanip association	36.62	Not Prime Farmland	Well drained	Slight	Moderately High	Slight	Moderate	56	No
180	Kidwell-Tenwell association	121.49	Not Prime Farmland	Well drained	Slight	Moderately Low	Slight	Moderate	>200	No
380	Tonopah-Arizo association	90.72	Not Prime Farmland	Excessively drained	Slight	Low	Slight	Moderate	>200	Yes
450	Arizo association	63.21	Not Prime Farmland	Excessively drained	Slight	Moderately High	Slight	Moderate	>200	Yes
470	Filaree-Seanna association	55.68	Not Prime Farmland	Well drained	Slight	Moderately Low	Slight	Moderate	>200	No
532	Seanna-Goldroad-Rock outcrop association	19.31	Not Prime Farmland	Well drained	Severe	Low	Severe	Low	25	No
620	Arizo-Lanip association	67.27	Not Prime Farmland	Excessively drained	Slight	Low	Slight	Moderate	>200	Yes
650	Peskah-Crosgrain association	55.06	Not Prime Farmland	Well drained	Slight	Low	Slight	Low	109	No
691	Hoppswell-Jetmine association	16.40	Not Prime Farmland	Well drained	Slight	Low	Slight	Low	>200	No
820	Newera-Rock outcrop association	25.70	Not Prime Farmland	Somewhat excessively drained	Moderate	Moderately Low	Moderate	Low	15	No

Table 10 Soil Types and Limitations within the Total Project Area on BLM Land

Soil Map Unit	Soil Map Unit Name	Acres within Total Project Area on BLM Land[a]	Prime Farmland	Drainage Class	Water Erosion Hazard	Wind Erosion Hazard[b]	Restoration Potential	Resistance to Compaction	Depth to Bedrock (cm)[c]	Severe Potential for Trench Caving[d]
910	Carrwash-Riverbend association	21.18	Not Prime Farmland	Excessively drained	Slight	Moderately Low	Slight	Moderate	>200	Yes

Notes:
a Acres are based on the total Project area on BLM-administered land.
b High = Wind Erodibility Group (WEG) 1-2; Moderately High = WEG 3; Moderate = WEG 4-5; Moderately Low = WEG 6; Low = WEG 7-8 (NRCS 2017)
c Depth to restrictive layer such as lithic or paralithic bedrock or duripan, if present (SSS 2018)
d Based on soil classification and SSS (2018) interpretation of unstable excavation walls for shallow excavations (numeric rating 0.5 or greater)

Table 11 Soil Erodibility Characteristics

MUSYM	MUNAME	Wind Erodibility Group[1] (WEG)	Wind Erodibility Index[2] (WEI)	Hydrologic Group[3]
100	Newera association	6	48	D
110	Tenwell-Crosgrain association	3	86	C
111	Tenwell-Shamock association	3	86	C
120	Crosgrain-Tenwell association	8	0	D
140	Haleburu extremely gravelly sandy loam, 4 to 15 percent slopes	8	0	D
141	Nipton-Haleburu-Rock outcrop association	8	0	D
150	Hypoint gravelly sandy loam, 0 to 4 percent slopes	5	56	A
151	Bluepoint-Arizo association	2	134	A
160	Lanip-Kidwell association	6	48	C
170	Tenwell-Lanip association	3	86	C
180	Kidwell-Tenwell association	6	48	C
380	Tonopah-Arizo association	8	0	A
430	Bluepoint-Tipnat-Grapevine association	2	134	A
450	Arizo association	3	86	A
455	Arizso-Tenwell association	8	0	A
470	Filaree-Seanna association	6	48	A
505	Pits, gravel	5	56	NA
532	Seanna-Goldroad-Rock outcrop association	8	0	D
591	Riverbend-Carrwash association	8	0	A
620	Arizo-Lanip association	8	0	A
650	Peskah-Crosgrain association	8	0	C
660	Crosgrain extremely gravelly loam, 4 to 15 percent slopes	8	0	D
663	Crosgrain-Kidwell-Arizo association	8	0	D
691	Hoppswell-Jetmine association	6	48	C
820	Newera-Rock outcrop association	5	56	D
910	Carrwash-Riverbend association	6	48	A
911	Carrwash association	6	48	A

Notes

1 A wind erodibility group (WEG) is a grouping of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to blowing. WEGs are not officially defined with respect to soil blowing susceptibility or potential. However, WEGs 1 and 2 are typically considered to have the highest susceptibility, WEGs 3 through 6 moderately high to moderately low susceptibility, and WEGs 7 and 8 have low susceptibility.

2 The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

3 **Group A** is sand, loamy sand, or sandy loam types of soils. It has low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission.
Group B is silt loam or loam. It has a moderate infiltration rate when thoroughly wetted and consists chiefly or moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures.
Group C soils are sandy clay loam. They have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure.
Group D soils are clay loam, silty clay loam, sandy clay, silty clay or clay. This group has the highest runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

Source: NRCS 2017

Table 12 Summary of Impacts to Ecological Communities[a]

Ecological Communities	Total Project Area[b] (acres) on BLM-Administered Land	Project Area[c] (acres) BLM-Administered Land and Non-BLM Land	Functional Desert Tortoise Habitat[d] (acres) on BLM-administered Land
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	755.38	629.46	419.01
North American Warm Desert Riparian Systems	137.89	116.85	85.92
Developed-Low Intensity	49.57	39.51	24.78
Mojave Mid-Elevation Mixed Desert Scrub	38.57	33.41	26.15
Sonora-Mojave Mixed Salt Desert Scrub	16.16	14.56	6.99
North American Warm Desert Badland	1.72	1.49	2.41
North American Warm Desert Pavement	5.16	4.39	
Inter-Mountain Basins Semi-Desert Shrub-Steppe	3.02	2.42	1.33
Developed-Open Space	3.61	1.85	1.17
North American Warm Desert Sparsely Vegetated Systems	0.79	0.76	0.51
North American Warm Desert Bedrock Cliff and Outcrop	0.53	0.51	0.34
Microphytic Playa Sparse Vegetation	0.21	0.17	0.06
Developed-Medium Intensity	0.01	0.01	0.00
TOTAL	**1,012.62**	**845.39**	**569.46**

Notes:

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends in this table.

b The Project area represents the total acres of land utilized for the Project and includes existing permanent ROW, TUP/temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads on both BLM-Administered Land and Non-BLM Land.

c The Project area represents the total acres of land utilized for the Project and includes existing permanent ROW, TUP/temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads only on BLM-Administered Land.
Project area ground disturbance consists of the portions of the Project area where vegetation will be removed and revegetated or where existing conditions will change. The Project area includes a number of existing roads on BLM and private land that will be utilized during construction resulting in no additional ground disturbance or improvements and/or change in existing conditions. As such, it is anticipated that those portions of the Project area that are currently used as existing roads will either not be disturbed or will not require restoration as they will remain as access roads consistent with current land use and vegetation.

d TUP/Temporary Easement Staging Area 1 would be used in Phase I and III. Acres of total Project Area associated with TUP/Temporary Easement Staging Area 1 is only included in Phase I. TUP/Temporary Easement Staging Area 8 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Staging Area 8 is only included in Phase I.

e TUP/Temporary Easement Access Road 1 would be used in Phase I and III. Acres of total Project area associated with TUP/Temporary Easement Access Road 1 is only included in Phase I. TUP/Temporary Easement Access Road 10 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Access Road 10 is only included in Phase I.

Source: Prior-Magee et al. 2007

Table 13 Weed Species Observed in the Project Area

Scientific Name	Common Name	State of Nevada Noxious Weed?
Brassica tournefortii	Sahara mustard	Yes - Category B
Bromus madritensis	Compact brome	No
Bromus rubens	Red brome	No
Erodium cicutarium	Red-stemmed filaree	No
Salsola spp	Russian thistle	No
Schismus spp	Mediterranean grass	No
Sisymbrium irio	London rocket	No
Tribulus terrestris	Puncturevine	Yes – Category C

Source: Arcadis 2020a

Table 14 Extrapolated Maximum Estimate of Weed Species in the Project Area within BLM-administered Land by Vegetation Community

Vegetation Community	Total Area of each Vegetation Community in the Project Area on BLM-administered Lands (acres)	Extrapolated Total Number of Weeds within BLM Land[1]						
		Sahara mustard	Red-stemmed filaree	Compact brome	Russian thistle	Red Brome	Mediterranean grass	London Rocket
Sonora-Mojave Creosote Bush-White Bursage Desert Scrub	755.4	57,197	9,223,043	1,180,347	1,873	123,761	54,736,499	1,686
North American Warm Desert Riparian Systems	137.9	4,425	5,546,060	504,486	0	501,663	11,592,716	229
Mojave Mid-Elevation Mixed Desert Scrub	38.6	797	2,043,714	662,650	0	4,541	499,576	398
Other Vegetated[1]	3.0	571	88,131	1,838	97	0	92,785	19
Other Sparsely Vegetated or Non-Vegetated	8.4	428	23,414	566	0	0	573,760	0
Total	**943.3**	**63,417**	**16,924,362**	**2,349,886**	**1,970**	**629,964**	**67,495,335**	**2,332**

Notes:
1 Estimates based on the average density in surveyed areas multiplied by the total hectares in the Project area
2 Includes both Sonora-Mojave Mixed Salt Desert Scrub and Inter-Mountain Basins Semi-Desert Shrub Steppe
3 Includes North American Warm Desert Pavement, North American Warm Desert Badland, North American Warm Desert Sparsely Vegetated Systems, and North American Warm Desert Bedrock Cliff and Outcrop
Weed abundances were estimated using pre-determined count categories (e.g., 1–5, 5–10, 10–50). These estimates assume the maximum values of those categories.
Source: Arcadis 2020a

Table 15 Extrapolated Cacti and Yucca on BLM-administered Land

Vegetation Community	Total Area of each Vegetation Community Occurring on BLM Land (acres)	Extrapolated Total Number of Cacti/Yucca on BLM Land[1] (Individuals per acre)											
		Buckhorn cholla	**Teddy-bear cholla**	**Silver cholla**	**Pencil cholla**	**Cottontop cactus**	**Hedgehog cactus**	**Desert barrel cactus**	**Common Fishhook Cactus**	**Beavertail cactus**	**Johnson pineapple cactus**	**Joshua Tree**	**Mojave yucca**
Sonora-Mojave Creosote Bush-White Bursage Desert Scrub	755.4	612	1,036	1,111	1,286	100	50	25	62	1,036	0	25	1,711
North American Warm Desert Riparian Systems	137.9	31	0	275	214	31	0	0	15	92	15	122	183
Mojave Mid-Elevation Mixed Desert Scrub	38.6	0	0	16	64	0	0	0	0	32	0	64	32
Other Vegetated[2]	3.0	27	2	4	76	0	2	0	0	15	0	0	46
Other Sparsely Vegetated or Non-Vegetated[3]	8.4	0	0	5	10	0	0	0	0	0	0	0	0
Total	**943.3**	**670**	**1,038**	**1,411**	**1,649**	**130**	**52**	**25**	**78**	**1,175**	**15**	**211**	**1,972**

Notes:

1 Estimates based on the average density in surveyed areas multiplied by the total acres on the BLM Land

2 Includes both Sonora-Mojave Mixed Salt Desert Scrub and Inter-Mountain Basins Semi-Desert Shrub Steppe

3 Includes North American Warm Desert Pavement, North American Warm Desert Badland, North American Warm Desert Sparsely Vegetated Systems, and North American Warm Desert Bedrock Cliff and Outcrop

Table 16 Vegetation Types within the Project Area Ground Disturbance[a]

Ecological Community	Vegetation Disturbance (acres)[b] on BLM-administered Land			
	Phase I	Phase II	Phase III	Total
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	155.71	98.05	375.70	629.46
North American Warm Desert Riparian Systems	65.11	10.27	41.48	116.85
Developed-Low Intensity	38.90	0.61		39.51
Mojave Mid-Elevation Mixed Desert Scrub	33.17		0.24	33.41
Sonora-Mojave Mixed Salt Desert Scrub			14.56	14.56
North American Warm Desert Badland			1.49	1.49
North American Warm Desert Pavement			4.39	4.39
Inter-Mountain Basins Semi-Desert Shrub-Steppe	2.21		0.22	2.42
Developed-Open Space		1.17	0.68	1.85
North American Warm Desert Sparsely Vegetated Systems			0.76	0.76
North American Warm Desert Bedrock Cliff and Outcrop			0.51	0.51
Microphytic Playa Sparse Vegetation			0.17	0.17
Developed-Medium Intensity	0.01	0.00	0.00	0.01
Total	**295.10**	**110.10**	**440.19**	**845.39**

Notes:

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends in this table.

b Project area ground disturbance consists of the portions of the Project area where vegetation would be removed and revegetated or where existing conditions would change. The Project area includes a number of existing roads on BLM and private land that would be utilized during construction resulting in no additional ground disturbance or improvements and/or change in existing conditions. As such, it is anticipated that those portions of the Project area that are currently used as existing roads would either not be disturbed or would not require restoration as they would remain as access roads consistent with current land use and vegetation.

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
PLANTS								
Alkali mariposa lily	*Calochortus striatus*	FS, NS	Occurs in moist locations, such as seeps and meadows, and in alkaline soils in chaparral, chenopod scrub, and Mojave desert scrub at elevations ranging from 70 to 1,595 meters(m) above mean sea level (amsl).	No	Recorded in Clark and Nye Counties. Potential habitat occurs in mixed shrub communities in the proposed Project area; however, no seeps or meadows were observed within the Project area.	Flowering April through early June.	Not Applicable	NNHP 2001a
Antelope Canyon goldenbush	*Ericameria cervina*	NS	Occurs in rocky crevices and talus in shadscale and Douglas fir/bristlecone pine forest communities at elevations ranging from 1,600 to 2,685 meters amsl.	No	Recorded in Clark and Lincoln Counties. Potential habitat not present in proposed Project area.	Flowering summer to early fall	Not Applicable	NNHP 2001b
Ash Meadows sunray	*Enceliopsis nudicaulis* var. *corrugata*	FT, NS	Occurs in dry to slightly moist locations, in strongly alkaline silty to clay soils in springs and seeps in creosote-white bursage, and shadscale scrub at elevations ranging from 670 to 720 meters amsl.	No	Recorded in Clark, Lincoln, and Nye Counties. Potential habitat occurs in seeps within Sonora-Mojave Creosotebush-White Bursage Desert Scrub Ecological Community in the Project area; however, no seeps or springs were observed within the Project area.	Flowering early spring	Not Applicable	NNHP 2001c, Peterson 2008a
Beaver Dam breadroot	*Pediomelum castoreum*	FS, NS	Occurs in sandy washes and road cuts within Joshua tree woodland and creosote bush scrub vegetation communities at elevations ranging from 610 to 1,525 meters amsl.	Yes	Recorded in Clark and Lincoln Counties. No NHHP records near the Project area; however, potential habitat occurs in washes in the Sonora-Mojave Creosotebush-White Bursage Desert Scrub Ecological Community in the proposed Project area.	Flowering in spring	Not Applicable	NNHP 2001d, Peterson 2008a
Black woollypod	*Astragalus funereus*	FS, NS	Occurs on volcanic tuff in dry open scree, talus, or gravelly alluvium in sagebrush and pinyon and juniper habitat at elevations ranging from 975 to 1,908 meters amsl.	No	Recorded in Clark, Lincoln, and Nye Counties. Clark County record not verified. Potential habitat could occur in Mojave Mid-Elevation Mixed Desert Scrub Ecological Community at an elevation of 975 meters.	Flowering early spring	Not Applicable	NNHP 2001e, Peterson 2008a
Blue Diamond cholla	*Cylindropuntia* [*Opuntia whipplei* var.] *multigeniculata*	NS	Occurs in dry open carbonate ledges, crevices, and rocky colluvium, near where gypsum occurs upslope in creosote and blackbrush vegetation communities at elevations ranging from 1,093 to 1,295 meters amsl. Likely endemic to the Blue Diamond Hills of Spring Mountain.	No	Recorded in Clark and Nye Counties. Listed as endemic to the Spring Mountains (west of Las Vegas); moreover, elevational range higher than Project area.	Flowering June through July	Not Applicable	NNHP 2001f
Clokey buckwheat	*Eriogonum heermannii* var. *clokeyi*	NS	Occurs in carbonate outcrops, talus, and scree slopes; gravelly washes and banks in creosote-white bursage, shadscale, and blackbrush vegetation communities at elevations from 1,219 to 1,830 meters amsl.	No	Recorded in Clark, Lincoln, and Nye Counties. Potential habitat occurs throughout the proposed Project area; however, likely at higher elevation than Project area.	Flowering May through September	Not Applicable	NNHP 2001g
Gold Butte moss	*Didymodon nevadensis*	NS	Occurs on or near gypsum soil deposits and limestone outcrops with other moss and lichen at elevations ranging from 400 to 700 meters amsl.	No	Recorded in Clark, Eureka, Lincoln, and Lander Counties. Potential habitat occurs throughout the proposed Project area; however, no significant gypsum soil areas were observed within the Project area.	Non-vascular. Seasonal growth starts in autumn and ends in following spring	Not Applicable	NNHP 2001h
Halfring milkvetch	*Astragalus mohavensis* var. *hemigyrus*	FS, NS	Occurs on carbonate gravels on terraced hills and ledges, and along washes in creosote-bursage, blackbrush, and mixed shrub vegetation communities at elevations ranging from 914 to 1,707 meters amsl.	Yes	Recorded in Clark, Lincoln, and Nye Counties. Not recorded within proposed Project area. Potential habitat occurs northwest of Searchlight in the Highland Range.	Flowering early spring	Not Applicable	NNHP 2001i
Jaeger beardtongue	*Penstemon thompsoniae* ssp. *jaegeri*	NS	Occurs in limestone soils on gravelly slopes and small drainages in pinyon and juniper vegetation communities at elevations between 1,700 and 2,700 meters amsl.	No	Known only to Clark County. No potential habitat and outside of Project elevational range.	Flowering May to August	Not Applicable	NNHP 2001j
Jaeger ivesia	*Ivesia jaegeri*	FS, NS	Occurs on carbonate and rocky soils within pinyon-juniper woodland and upper montane coniferous forest vegetation communities at elevations ranging from 1,830 to 3,600 meters amsl.	No	Known only from Clark County. Potential habitat not present and occurs outside of elevational range of the proposed Project area.	Flowering June through July	Not Applicable	NNHP 2001k
Las Vegas bearpoppy	*Arctomecon californica*	FS, NS	Open, dry, spongy, or powdery, often dissected ("badland") or hummocked soils with high gypsum content in creosote bush scrub, black brush scrub vegetation	No	Recorded in Clark County, Nevada. Potential habitat occurs in creosote bush scrub south of Henderson in the McCullough Range and El Dorado Valley;	Flowering March through May	Not Applicable	NNHP 2001l

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
			communities at elevations ranging from 323 to 1,110 meters amsl.		however, no significant gypsum soil areas were observed within the Project area.			
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	FC, NS	Occurs on and near gypsum soils in washes or drainages in vegetation communities with creosote bush and white bursage at an elevational range of 576 to 1,170 meters amsl.	Yes	Recorded in Clark County. Potential habitat occurs throughout the proposed Project area.	Flowering August through November	Not Applicable	NNHP 2001m
Mokiak milkvetch	*Astragalus mokiacensis*	FS, NS	Occurs on loose, sandy to gravelly soils in creosote-bursage, blackbrush, and mixed shrub vegetation communities at elevations ranging from 750 to 1,189 meters amsl.	Yes	Recorded in Clark County. No records within Project area. Potential habitat occurs throughout the proposed Project area.	Flowering March through early May	Not Applicable	NNHP 2001n
New York Mountains catseye	*Cryptantha tumulosa*	NNHP	Occurs in gravelly or clay, granitic or carbonate soils typically associated with Mojave desert scrub and pinyon and juniper woodland vegetation communities. Species has not been systematically surveyed in Nevada.	No	Recorded in Clark County. No records within Project area. Potential habitat occurs throughout the proposed Project area.	Flowering April through June	Not Applicable	NNHP 2001o
Nevada willowherb	*Epilobium nevadense*	FS, NS	Occurs in limestone outcrops in pinyon and juniper woodland vegetation communities at elevations ranging from 1,820 to 2,720 meters amsl.	No	Recorded in Clark, Eureka, Lander, and Lincoln Counties. Potential habitat not present in proposed Project area.	Flowering June to August	Not Applicable	NNHP 2001p
Pahrump Valley buckwheat	*Eriogonum bifurcatum*	FS, NS	Occurs on barren, saline, heavy clay or silty hardpan soils, on or near playas, low terraces, and stabilized sand dunes. In saltbush scrub and desert willow vegetation communities at an elevational range of 750 to 845 meters amsl.	Yes	Recorded in Clark and Nye Counties. Potential habitat occurs in the Sonora-Mojave Mixed Salt Desert Scrub and Semi-Desert Shrub-Steppe Ecological Community throughout the proposed Project area.	Flowering mid-May through mid-June	Not Applicable	NNHP 2001q, Peterson 2008a
Parish phacelia	*Phacelia parishii*	FS, NS	Occurs along dry lake beds and playa communities with clay or alkaline soils surrounded by saltbush vegetation at elevations ranging from 535 to 885 meters amsl.	Yes	Recorded in Clark, Lincoln, White Pine, and Nye Counties. Potential habitat occurs in Sonora-Mojave Mixed Salt Desert Scrub Ecological Community near the Big Bend Recreational Area southwest of Laughlin in the Project area.	Flowering April through June	Not Applicable	NNHP 2001r, Peterson 2008a
Polished blazingstar	*Mentzelia polita*	NS	Occurs on limestone and gypsum-rich soils in washes within creosote bush scrub vegetation communities at elevations ranging from 576 to 1,580 meters amsl.	Yes	Recorded in Clark, Lincoln, and Esmeralda Counties. Potential habitat occurs in the Sonora-Mojave Creosotebush-White Bursage Desert Scrub Ecological Community in the proposed Project area.	Flowering April and May	Not Applicable	NatureServe 2017f, Peterson 2008a
Red Rock Canyon aster	*Ionactis caelestis*	NS	Occurs in crevices of Aztec sandstone in pinyon and juniper forest vegetation communities at 2,075 meters amsl.	No	Known only from Clark County. Potential habitat not present in proposed Project area.	Flowering in summer	Not Applicable	NNHP 2001s
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	FS, NS	Occurs in creosote- white bursage scrub, blackbrush scrub, and juniper woodland vegetation communities in calcareous or carbonate soils. It is typically associated with washes, roadsides, or similar places receiving enhanced runoff at elevations between 780 and 1,735 meters amsl.	Yes	Recorded in Clark and Nye Counties. Potential habitat occurs throughout the proposed Project area.	Flowering in May	Not Applicable	NNHP 2001t
Scrub lotus	*Acmispon* [*Lotus*] *argyraeus var. multicaulis*	NS	Occurs in sandy washes, ledges, or clay slopes in canyons in blackbrush, mixed shrub, sagebrush, or lower pinyon juniper vegetation communities at elevations ranging from 1,200 to 1,500 meters amsl.	Yes	Recorded in Clark County, Nevada. Potential habitat occurs at high elevations in Mojave Mid-Elevation Mixed Desert Scrub Ecological Community northwest of Searchlight in the Highland Range.	Flowering in early April through June	Not Applicable	NatureServe 2017g, Peterson 2008a
Sheep fleabane	*Erigeron ovinus*	FS, NS	Occurs in pinyon juniper and montane conifer zones within crevices of carbonate cliffs and ridgeline outcrops. In the pinyon juniper and montane conifer zones. Recorded at 1,097 meters amsl.	No	Recorded in Clark and Lincoln Counties. Potential habitat not present within the proposed Project area and at the elevational limit of the known range.	Flowering late-spring to summer	Not Applicable	NNHP 2001u
Silverleaf sunray	*Enceliopsis argophylla*	NS	Occurs in dry, relatively barren areas on gypsum badlands, volcanic gravels, and loose sands in creosote bush - white	Yes	Recorded in Clark County. Potential habitat occurs south of El Dorado Substation.	Flowering spring through summer	Not Applicable	NNHP 2001v

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
			bursage vegetation communities at elevations from 355 to 725 meters amsl.					
Smooth dwarf greasebush	*Glossopetalon pungens* var. *glabrum*	NS	Occurs in crevices of carbonate cliffs in pinyon juniper, mountain mahogany, and montane conifer zones at elevations from 1,830 to 2,375 meters amsl.	No	Recorded in Clark and Nye Counties. Potential habitat not present in proposed Project area.	Flowering mid-April to early June	Not Applicable	NNHP 2001w
Spring Mountains milkvetch	*Astragalus remotus*	FS, NS	Occurs on rocky, gravelly, sandy calcareous soils in washes, drainages, hillsides, and rocky ledges in desert shrub and desert wash vegetation communities at elevations ranging from 1,036 to 1,707 meters amsl.	No	Recorded in Clark County. No records in proposed Project area. Outside of elevational range of proposed Project.	Flowering April through early June.	Not Applicable	NNHP 2001x
Sticky buckwheat	*Eriogonum viscidulum*	FS, NS	Occurs in deep, loose, sandy soils in washes and flats, roadsides, steep slopes, and stabilized dunes in creosote bush-white bursage vegetation communities at elevations from 365 to 760 meters amsl.	Yes	Recorded in Clark and Lincoln Counties. Potential habitat occurs throughout the proposed Project area.	Flowering April through June	Not Applicable	NNHP 2001y
Sticky ringstem	*Anulocaulis leiosolenus var. leiosolenus*	NS	Occurs in calcareous clays and shales, potentially on gypsum in creosote bush scrub and mixed shrub vegetation communities at elevations ranging from 400 to 1,200 meters amsl.	Yes	Recorded in Clark County, Nevada and Mojave National Preserve. Potential habitat occurs at all elevations in creosote bush scrub.	Flowering late spring through early fall.	Not Applicable	NatureServe 2017h
Stream stippleback lichen	*Dermatocarpon luridum*	NS	Occurs on wet rocks, usually along stream edges at the waterline along shaded streams where moderately clean water is known to occur at 1,122 meters amsl.	No	Recorded in Clark County. Potential habitat not present in the proposed Project area.	Non-vascular	Not Applicable	NatureServe 2017i
Threecorner milkvetch	*Astragalus geyeri var. triquetrus*	FS, NS	Occurs on open, deep, sandy soil or dunes at elevations ranging from 335 to 756 meters amsl.	No	Recorded in Clark and Lincoln Counties. No dune habitat in Project area.	Flowering late winter early spring	Not Applicable	NNHP 2001z
Torrey milkvetch	*Astragalus calycosus* var. *monophyllidius*	NS	Occurs on limestone on open gravelly hillsides in pinyon and juniper forest habitat at elevations ranging from 1,631 to 2,275 meters amsl.	No	Recorded in Clark, Elko, Eureka, Lincoln, and Nye Counties. No habitat exists and outside of elevational range of proposed Project area.	Flowering May through June, but not verified for this subspecies.	Not Applicable	NNHP 2001aa
Virgin River thistle	*Cirsium mohavense*	FS, NS	Occurs in moist soils around springs, canyons, and streams in creosote bush scrub vegetation communities at elevations ranging from 250 to 2,800 meters amsl.	Yes	Recorded in Clark, Esmeralda, Eureka, Lander, Lincoln, Mineral, and Nye Counties. Potential habitat occurs the Big Bend Recreational Area southwest of Laughlin in the Project area.	Flowering July through October	Not Applicable	NatureServe 2017j
White bearpoppy	*Arctomecon merriamii*	NS	Occurs on a multiple soil types including alkaline clay, sand, gypsum, rocky calcereous, and carbonate rock outcrops in creosote-bursage, blackbrush, and mixed shrub vegetation communities at elevations ranging from 610 to 1,914 meters amsl.	Yes	Recorded in Clark, Lincoln, and Nye Counties. Potential habitat occurs throughout the proposed Project area.	Flowering in spring	Not Applicable	NNHP 2001ab
White-margined beardtongue	*Penstemon albomarginatus*	FS, NS	Occurs in loose desert sand on stabilized dunes in the Mojave Desert at elevations ranging from 700 to 900 meters amsl.	No	Recorded in Clark and Nye Counties. No dune habitat occurs within the proposed Project area.	Flowering in May	Not Applicable	NNHP 2001ac
Yellow twotone beardtongue	*Penstemon bicolor* ssp. *bicolor*	FS, NS	Occurs in creosote-bursage scrub, blackbrush scrub, and juniper woodland vegetation communities in calcareous or carbonate soils. It is typically associated with washes, roadsides at elevations between 180 and 1,735 meters amsl.	Yes	Recorded in Clark County. Potential habitat occurs throughout the proposed Project area.	Flowering in May	Not Applicable	NNHP 2001ad
AMPHIBIANS								
Amargosa toad	*Anaxyrus nelsoni*	NS, SWAP_SoCP	Habitat requirements for breeding and population recruitment include the presence of open, ponded, or flowing water, with riparian vegetative cover forming a partial canopy for shade.	No	This species is not likely to be present due to the Project area being outside of the species' known range.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012b

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Relict leopard frog	*Rana onca*	FC, NNHP, NS, SP, SWAP_SoCP	Relict leopard frogs occupy spring, spring outflow, and associated marsh and wetland habitats generally in close proximity to river systems.	No	This species is not likely to be present due to lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012b
BIRDS								
Non-raptor Birds								
American white pelican	*Pelecanus erythrorhynchos*	MBTA, NNHP, SP, SWAP_SoCP	Habitat is primarily rivers, lakes, reservoirs, estuaries, and marshes. Rests and nests on islands and peninsulas in brackish or freshwater lakes.	No	Not likely to occur due to the lack of suitable habitat in the Project area. American white pelicans were observed during the 2017 field verification flying well above the Project area, and actual use of the Project area is not expected.	Not Applicable. Observed flying over the Project area during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012c
American pipit	*Anthus rubescens*	MBTA	Winter migrants found in cropland, grassland, sand/dune habitats. Forages on insects and seeds.	Yes	The Project area is within the species winter range.	May use the project area in winter. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Hendricks and Verbeek 2012
Ash-throated flycatcher	*Myiarchus cinerascens*	MBTA, SP	Semi-arid country, deserts, brush, mesquites, pinyon-juniper, dry open woods. Found in a wide variety of lowland habitats, usually open and rather arid, avoiding mountains and forests. It may live in wide-open grassland if nest sites are available.	Yes	The Project area is within the species' breeding range, and suitable breeding habitat may be present.	May breed in the Project area.	Cavity	Cardiff and Dittmann 2002
Bendire's thrasher	*Toxostoma bendirei*	MBTA, BCC, NNHP, NS, SWAP_SoCP	Uses a variety of desert habitats with fairly large shrubs or cacti and open ground or open woodland with scattered shrubs and trees.	Yes	The Project area is within the species' breeding range, and suitable breeding habitat may be present.	May breed in the Project area.	Shrub, tree	Wildlife Action Plan Team 2012c
Bewick's wren	*Thryomanes bewickii*	MBTA, SP	Favors brushy areas, scrub and thickets in open country, or open woodland. Bewick's wrens normally breed in areas that contain a mixture of thick, scrubby vegetation and open woodland.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area.	Cavity	Kennedy and White 2013
Black-headed grosbeak	*Pheucticus melanocephalus*	MBTA, SP	Occupies deciduous and mixed woods. Breeds mainly in oak woodland, streamside groves of cottonwood and willow, pine-oak woods in mountains, pinyon-juniper woodland; not usually in purely coniferous forest. During migration, occurs in any kind of open woods, streamside trees, suburbs, mesquite groves, and desert washes.	Yes	The Project area is within the species' migratory range, and suitable habitat may be present.	May migrate through the Project area.	Shrub, tree	Ortega and Hill 2010
Black-necked stilt	*Himantopus mexicanus*	MBTA, SP	Prefers grassy marshes, mudflats, pools, and shallow lakes (fresh and alkaline). Found during all seasons at the margins of shallow water in very open country, especially where there is much marsh growth.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Robinson et al. 1999
Black-tailed gnatcatcher	*Polioptila melanura*	MBTA, SP	Associated with desert brush, ravines, dry washes, and mesquites. Found in many dry, scrubby habitats.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Shrub	Farquhar and Ritchie 2002
Black-throated sparrow	*Amphispiza bilineata*	MBTA, SP	Lives in a variety of dry, open habitats from Sonoran Desert with its mix of shrubs and cacti to very barren flats of creosote bush or saltbush. Also, locally in grassland with scattered cacti, sagebrush flats, and open pinyon-juniper woods.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Portions of the Project area may occur in year-round habitat and others may occur in breeding habitat only. Evidence of Project area use was noted during 2017 surveys.	Shrub, cactus	Johnson et al. 2002
Blue-gray gnatcatcher	*Polioptila caerulea*	MBTA	Prefers shorter woodlands and shrublands including pinyon-juniper and oak woodlands.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Portions of the project area may occur in year-round habitat and others may occur in breeding habitat only. Evidence of Project area use was noted during 2017 surveys.	Shrub, tree	Kershner and Ellison 2012

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Bushtit	*Psaltriparus minimus*	MBTA, SP	Associated with oak scrub, chaparral, mixed woods, pinyons, and junipers. Avoids high mountains and hot desert regions, but may appear in cottonwood-willow groves along desert streams in winter.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	May breed and winter in the Project area.	Tree, shrub	Sloane 2001
Common poorwill	*Phalaenoptilus nuttallii*	MBTA	Scrubby and bushy areas, prairie, desert, rocky canyons, open woodland, and broken forest, primarily in arid or semi-arid habitats. Found in valleys and foothills, mixed chaparral-grassland, and pinyon-juniper habitat. Nests in open areas on a bare site.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.		Woods et al. 2005
Common raven	*Corvus corax*	MBTA	Various situations from lowlands to mountains, open country to forested regions, and humid regions to desert; most frequently in hilly or mountainous areas, especially in vicinity of cliffs. Nests usually on cliff ledges or in coniferous trees, also on man-made structures.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May breed in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cliff, tree, man-made structures	Boarman et al. 1999
Crissal thrasher	*Toxostoma crissale*	MBTA, SWAP_SoCP	Desert scrub, mesquite, tall riparian brush and, locally, chaparral, usually beneath dense cover.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May breed in the Project area. Evidence of Project area use was noted during 2017 surveys.	Shrub	Wildlife Action Plan Team 2012c
Dark-eyed junco	*Junco hyemalis*	MBTA	During winter associated with open woodlands, fields, parks, roadsides, and backyards.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May use the Project area. Evidence of Project area use was noted during 2017 surveys.	Ground	Nolan et al. 2002
Gambel's quail	*Callipepla gambelii*	GS	Found in brushy desert and canyons.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Ground	NDOW 2017c
Gila woodpecker	*Melanerpes uropygialis*	MBTA, BCC	Found in desert washes, saguaros, river groves, cottonwoods, and towns. Generally, in dry country, but requires suitable sites for nesting cavities: cottonwood groves along rivers, large mesquites or willows, palms, and giant cactus such as saguaro.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cavity, tree, cactus	Edwards and Schnell 2000
Gilded flicker	*Colaptes chrysoides*	MBTA, NNHP, BCC, SWAP_SoCP	Habitat includes stands of giant cactus (saguaro), Joshua tree, and riparian groves of cottonwood and tree willows in warm desert lowlands and foothills.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area.	Cavity in saguaro cactus	Wildlife Action Plan Team 2012c
Greater roadrunner	*Geococcyx californianus*	MBTA	Desert scrub, chaparral, edges of cultivated lands, and arid open situations with scattered brush, locally in cedar glades and pine-oak woodland, usually nests low (3-15 ft from ground) in tree, shrub, or clump of cactus. Rarely nests on ground. The nest is made of sticks lined with leaves grasses, feathers, snakeskin, dry pieces of livestock manure, and other items.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Low in tree, shrub or cactus	Hughes 2011
Horned lark	*Eremophila alpestris*	MBTA	Grassland, tundra, sandy regions, areas with scattered low shrubs, desert playas, grazed pastures, stubble fields, open cultivated areas, and (rarely) open areas in forest. Nests in hollows on ground often next to grass tuft or clod of earth or manure.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Ground	Beason 1995

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House finch	*Haemorhous mexicanus*	MBTA	Arid scrub and brush, thornbush, oak-juniper, pine-oak association, chaparral, open woodland, towns, cultivated lands, savanna. Nests on ledge; on branch of tree, shrub, and cactus; and in hole in tree or wall. May use nest of other species (e.g., grosbeak, cliff swallow); also may use bird house, building ledge, hanging plant, or other areas. Not a competitive threat to native cavity nesting birds in the eastern North America.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Tree, shrub, cactus, man-made structures	Badyaev et al. 2012
Le Conte's thrasher	*Toxostoma lecontei*	MBTA, NNHP, NS, BCC, SP, SWAP_SoCP	Inhabits desert scrub. In Nevada, the species is particularly associated with saltbush flats and wash systems.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cholla, saltbush, small tree, shrub	Wildlife Action Plan Team 2012c
Lesser goldfinch	*Spinus psaltria*	MBTA	Partly open situations with scattered trees, woodland edge, second growth, open fields, pastures, and around human habitation. Found in areas where water is available. Nest is built by female in tree or shrub.	Yes		Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Tree	Watt and Ernest 1999
Lincoln's sparrow	*Melospiza lincolnii*	MBTA, SP	Winters in dense thickets and overgrown fields.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area.	Not Applicable	Ammon 1995
Loggerhead shrike	*Lanius ludovicianus*	MBTA, BCC, NS, SS, SWAP_SoCP	Found in open country with scattered trees and shrubs, in savannas, desert scrub, and occasionally in open juniper woodlands.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Shrub, small tree	Wildlife Action Plan Team 2012c
Marsh wren	*Cistothorus palustris*	MBTA, SP	Breeds in many fresh and brackish marsh situations, usually with a large area of cattails, bulrushes, or cordgrass; also in other kinds of low-rank growth along shallow water. Winters in a wider variety of large and small marshes, including salt marshes and brushy edges of ponds or irrigation ditches.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Kroodsma and Verner 2013
Phainopepla	*Phainopepla nitens*	MBTA, SWAP_SoCP, NNHP	Desert scrub, mesquite, juniper and oak woodland, tall brush, riparian woodland, and orchards. Nests in trees or shrubs.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Tree	Wildlife Action Plan Team 2012c
Ridgway's rail	*Rallus obsoletus*	FE, SE, SWAP_SoCP	Lives in saltmarsh swamps with extensive vegetation.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c
Rock wren	*Salpinctes obsoletus*	MBTA, SP	Breeds in a variety of rocky places. Found at elevations from low canyons to high in mountains, wherever surroundings are very open and arid, but scarce in hot desert regions in summer. Winters in rocky places at low elevations; sometimes on rock levees or on stone riprap below dams. In the absence of rocks, it may establish winter territory around stacks of hay bales, pieces of farm equipment, or other landmarks.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Lowther et al, 2010
Ruby-crowned kinglet	*Regulus calendula*	MBTA, SP	Winters in a wide variety of habitats, mainly in open deciduous woods, also in coniferous and mixed woods, mesquite brush, and streamside thickets.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Swanson et al. 2008
Sagebrush sparrow	*Artemisiospiza nevadensis*	MBTA, BCC, SP, SWAP_SoCP	Strongly associated with sagebrush for breeding. Also found in salt-bush brushland, shadscale, antelope brush, rabbitbrush, mesquite, and chaparral.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the Project area.Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012c

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Sage thrasher	*Oreoscoptes montanus*	MBTA, NS, SWAP_SoCP, BCC	Occupies sagebrush, brushy slopes, and mesas; in winter, also deserts. Breeds almost entirely in sagebrush areas, either in wide open flats or where sagelands meet open pinyon-juniper woods. More widespread in migration and winter, occurring in grassland with scattered shrubs, desert, pinyon-juniper woods, and other semi-open areas.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the Project area.	Not Applicable	Reynolds et al. 1999
Sandhill crane	*Grus canadensis*	MBTA, NNHP, SWAP_SoCP	Prefers open grasslands, marshes, marshy edges of lakes and ponds, and river banks. Roosts at night along river channels or natural basin wetlands. Often feeds and rests in fields and agricultural lands.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable. Observed flying over the Project area during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012c
Say's phoebe	*Sayornis saya*	MBTA, SP	Occupies scrub, canyons, and ranches. Found in open or semi-open terrain, often in dry country, avoiding forested areas. Often in farmland, savannah, or prairie in south, dry upland tundra in northern part of range.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Ledge, cavity (artifical and natural sites)	Schukman and Wolf 1998
Scott's oriole	*Icterus parisorum*	MBTA, SP, SWAP_SoCP	Associated with Joshua tree (yucca), pinyon-juniper, arid oak scrub, and palm oases.	Yes	The Project area is within the species' breeding range, and suitable habitat may be present.	May breed in the Project area.	Tree	Wildlife Action Plan Team 2012c
Song sparrow	*Melospiza melodia*	MBTA, SP	In most areas, found in brushy fields, streamsides, shrubby marsh edges, woodland edges, hedgerows, well-vegetated gardens. Nests in dense streamside brush in southwestern desert.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area.	Ground, shrub, tree	Arcese et al. 2002
Southwestern willow flycatcher	*Empidonax traillii extmus*	MBTA, FE, NNHP, NS, SE, SWAP_SoCP	Breeds in relatively dense riparian tree and shrub vegetation communities associated with rivers, swamps, and other wetlands including lakes and reservoirs.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c
Vesper sparrow	*Oreothlypis virginiae*	MBTA, SP	In all seasons, favors open grassy or weedy fields, often in rather dry situations with much open soil.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area.	Not Applicable	Jones and Cornely. 2002
Verdin	*Auriparus flaviceps*	MBTA, SWAP_SoCP	Desert and arid brush, primarily in mesquite and creosote bush. Nests in a shrub, small tree, or cactus, usually nests near the end of a branch.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Shrub	Webster 1999
Virginia's warbler	*Vermivora virginiae*	MBTA, SWAP_SoCP	Prefers arid montane woodlands, oak thickets, pinyon-juniper, coniferous scrub, and chaparral.	Yes	The Project area is within the species' breeding and migratory ranges, and suitable habitat may be present.	May breed in and migrate through the project area.	Ground	NDOT 2013b
Western meadowlark	*Sturnella neglecta*	MBTA	Habitat includes grasslands, savannas, cultivated fields, and pastures in lowland and mountain valleys, foothills, and open mountains. Female builds nest on dry ground. Nest is a large domed structure of woven grasses and ground vegetation.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Ground	Davis and Lanyon 2008
White-crowned sparrow	*Zonotrichia leucophrys*	MBTA, SP	Found in boreal scrub, forest edges, thickets, chaparral, gardens, parks; in winter, also found on farms and desert washes.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the project area. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Chilton et al. 1995
White-faced ibis	*Plegadis chihi*	MBTA, NNHP, SP, SWAP_SoCP	Primary habitat is marshes, swamps, ponds, and rivers, mostly in freshwater habitats.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c
Yellow-billed cuckoo (Western Distinct Population Segment)	*Coccyzus americanus*	FT, NS, SWAP_SoCP, BCC, NNHP, MBTA	Obligate riparian species for breeding including dense cottonwood-willow forested tracts. Uses cottonwoods extensively for foraging.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Hughes 2015
Yellow-rumped warbler	*Setophaga coronata*	MBTA	Nests in forests or open woodlands. During migration and winter found in open forests, woodlands, savanna, roadsides, pastures, and scrub habitat. May be seen in parks and gardens. Nests on branches.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident of the Project area. Evidence of Project area use was noted during 2017 surveys.	Tree	Hunt and Flaspohler 1998

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Yuma clapper rail	*Rallus longirostris yumanensis*	FE, MBTA, NNHP, NS, SE, SWAP_SoCP	Generally found in freshwater and alkali marshes dominated by stands of emergent vegetation interspersed with areas of open water and drier, upland benches. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the water edges with stable water levels.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c
Raptors								
American kestrel	*Falco sparverius*	MBTA	Occupies open country, farmland, cities, and wood edges. Breeding habitat includes semi-open habitats, meadows, grasslands, deserts, agricultural fields, urban and suburban areas.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cavity	Smallwood and Bird 2002
Bald eagle	*Haliaeetus leucocephalus*	SE, NNHP, NS, SWAP_SoCP, MBTA, BGEPA, BCC	Usually nests in tall trees or on cliffs near large water bodies. Conifers are preferred as winter roost sites.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Portions of the Project area may occur in year-round habitat and others may occur in wintering habitat only.	Tree, cliff	Wildlife Action Plan Team 2012c
Barn owl	*Tyto alba*	MBTA	Occupies woodlands, groves, farms, barns, towns, and cliffs. Typically, in open or semi-open country in lowlands. May nest in forest or city if nearby area has good open foraging territory, such as farmland, marsh, prairie, or desert.	Yes	The Project area is within the species' breeding and wintering ranges, and suitable habitat may be present.	May breed and winter in the Project area.	Cavity	Marti et al. 2005;
California spotted owl	*Strix occidentalis occidentalis*	MBTA, NNHP, SWAP_SoCP	Typical habitat is dense, multi-layered evergreen forest that includes a diversity of tree species, large trees (some greater than 83 centimeters [cm] diameter at breast height [DBH]), some trees with evidence of decadence, and open areas under the canopy; most often on lower, north-facing slopes of canyons, usually within 0.3 km of water.	No	This species is unlikely to be present due to the Project area being outside of the species' known range.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c
Cooper's hawk	*Accipiter cooperii*	MBTA	Occupies mature forest, open woodlands, wood edges, and river groves. Nests in coniferous, deciduous, and mixed woods, typically those with tall trees and with openings or edge habitat nearby. Also found along trees along rivers through open country, and increasingly in suburbs and cities where some tall trees exist for nest sites. In winter, may be in fairly open country, especially in the west.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area.	Not Applicable	Curtis et al. 2006
Elf owl	*Micrathene whitneyi*	MBTA, BCC	Found in any lowland habitat providing cover and good nesting cavities. Most common in deserts with many tall saguaro cactus or large mesquites, and in canyons in the foothills, especially around sycamores or large oaks.	Yes	The Project area is within the species' breeding range, and suitable habitat may be present.	May breed in the Project area.	Cavity in tree or cactus	Henry and Gehlbach 1999
Ferruginous hawk	*Buteo regalis*	NS, SWAP_SoCP, MBTA, NNHP	Inhabits open country including grasslands and shrublands, while avoiding forests, steep terrain, and high elevations. Most likely to be found in sagebrush scrub, but may also occur in salt desert scrub and sagebrush steppe. May also be associated with pinyon-juniper blocks.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the Project area.	Not Applicable	Wildlife Action Plan Team 2012c
Flammulated owl	*Otus flammeolus*	MBTA, SWAP_SoCP	Occupies montane forest, usually open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement ponderosa pine forests). Shows a strong preference for "yellow pine" (i.e., ponderosa pine) throughout its range.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012c

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Golden eagle	*Aquila chrysaetos*	NS, SWAP_SoCP, MBTA, BGEPA	Nests in crags, canyons, cliffs, and mountains. Forages in areas surrounding nest sites and can be found in any habitat type. Generally found in open country, including prairie, shrubland, open woodland, and barren areas.	Yes	The Project area is within the species' wintering and breeding ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cliff, rocky outcrop, and tree	Wildlife Action Plan Team 2012c
Merlin	*Falco columbarius*	MBTA	Prefers semi-open areas near forest openings, often near rivers.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area.	Not Applicable	Warkentin et al. 2005
Northern goshawk	*Accipiter gentilis*	SS, NNHP, NS, SWAP_SoCP, MBTA	Nests in various forest types with a preference for taller, mature stands with significant canopy cover. In Nevada, aspens are a key habitat feature, though conifers are used for nesting as well. Also occur in shrub-dominated habitats likely used for foraging.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area.	Tree	Wildlife Action Plan Team 2012c
Northern harrier	*Circus cyaneus*	MBTA	Occupies marshes, meadows, agricultural fields, and arid sagebrush or shadscale shrublands.	Yes	The Project area is within the species' wintering range, and suitable habitat may be present.	May winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Smith et al. 2011
Osprey	*Pandion haliaetus*	MBTA	Occurs in a wide range of habitats, as long as there is an adequate supply of accessible fish within commuting distance (10 to 20 km).	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Bierregaard et al. 2016
Peregrine falcon	*Falco peregrinus*	SE, NNHP, NS, SWAP_SoCP, MBTA, BCC	May be found in a variety of habitat types. Known nest sites in Nevada have occurred on cliff ledges or high buildings. Nests in Nevada generally occur near lakes, wetlands, or river systems.	Yes	The Project area is within the species' wintering and breeding ranges, and suitable habitat may be present.	May breed and winter in the Project area.	Cliff	White et al. 2002
Prairie falcon	*Falco mexicanus*	MBTA, BCC, SWAP_SoCP	Preferred landscapes are cliffs adjacent to arid valleys with low vegetation. Often observed foraging over a variety of sagebrush, salt desert, and Mojave scrub shrublands throughout the year, and they also occur in agricultural lands, especially during the winter months.	Yes	The Project area is within the species' wintering and breeding ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Cliff (cavities and ledges)	Wildlife Action Plan Team 2012c
Red-tailed hawk	*Buteo jamaicensis*	MBTA	Typically breeds in semi-open habitats, coniferous and deciduous woodlands, grasslands, shrublands, deserts, agricultural and urban landscapes with elevated nest-perch sites.	Yes	The Project area is within the species' wintering and breeding ranges, and suitable habitat may be present.	May breed and winter in the Project area. Evidence of Project area use was noted during 2017 surveys.	Tree, shrub, outcrop, manmade structures	Preston and Beane 2009
Short-eared owl	*Asio flammeus*	SWAP_SoCP, MBTA	Preferred habitat types include fresh and saltwater marshes, grassy plains, old fields, river valleys, meadows, and open woodland.	Yes	The project area is within the species' wintering range, and suitable habitat may be present.	May migrate through the Project area. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012c
Swainson's hawk	*Buteo swainsoni*	NS, MBTA, NNHP	Uses open grasslands and shrublands and is well adapted to agricultural areas. Typically nests in scattered trees near open areas for foraging, usually in large, deciduous trees, often in riparian areas.	Yes	The Project area is within the species' migratory range, and suitable habitat may be present.	May migrate through the Project area.	Not Applicable	Wildlife Action Plan Team 2012c
Turkey vulture	*Cathartes aura*	MBTA	Open habitats, especially farmland and rangeland, near forested areas or rock outcrops for nesting.	Yes	The Project area is within the species' breeding range, and suitable habitat may be present.	May breed in the Project area.	Cliff, tree	Kirk and Mossman 1998
Western burrowing owl	*Athene cunicularia hypugaea*	BCC, NNHP, NS, SWAP_SoCP, MBTA	Uses a variety of habitats that are open, arid, and treeless with low vegetation. Most common where mammal burrows are available for nesting. Will often breed near agricultural lands, golf courses, and roadsides, but will not tolerate highly disturbed areas.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Portions of the Project area may occur in year-round habitat and others may occur in breeding habitat only.	Burrow	Wildlife Action Plan Team 2012c

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MAMMALS								
Allen's big-eared bat	*Idionycteris phyllotis*	NNHP, NS, SP, SWAP_SoCP	Inhabits mountainous areas and uses a variety of habitats including Mojave Desert scrub, coniferous forests, and riparian woodlands. Roosts in rocks, cliffs, snags, and mines throughout its range but known roosts in Nevada consist only of snags and abandoned mines. Maternity colonies are generally found in mines. In the winter, they may move from higher elevations to lower elevations.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Bobcat	*Lynx rufus*	GS	Bobcats of Nevada tend to select areas that offer protection from severe weather, have large prey abundance, are free from human disturbance, and provide coverage such as vegetation and rocks. These cats choose rocky areas near the mouths of canyons and fissures. Bobcats in the desert valley select broken rocky ledges about 30 meters above the desert floor since these holes offer rest, shade, and refuge for young.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	NDOW no date
Big free-tailed bat	Nyctinomops macrotis	NS	Primarily inhabit rugged, rocky habitats in arid landscapes. It has been observed in a variety of plant associations, including desert shrub, woodlands, and evergreen forests. It appears to be associated with lowlands primarily below 5,900 feet in the southwestern U.S.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	U.S. Forest Service no date
California leaf-nosed bat	*Macrotus californicus*	NNHP, NS, SS, SWAP_SoCP	Roosts in caves and mines. Night roosting can occur in a variety of places, including buildings, cellars, porches, bridges, rock shelters, and mines. Because this species does not hibernate or migrate long distances, they will move to specific, warm winter roosts, such as geothermally heated abandoned mines.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
California myotis	*Myotis californicus*	NS	Habitat includes semi-arid desert regions of the Southwest, arid grasslands, forested regions of the Pacific Northwest, humid coastal forests, and montane forests. Summer roosts include crevices in rocky hillsides, rocky outcrops, buildings, trees with exfoliating bark, and cavities in snags.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Arroyo-Cabrales and Perez 2017
Cave myotis	*Myotis velifer*	NNHP, NS	Day roosts in caves, mines, and buildings. Night roosts in caves, mines, buildings, culverts, and bridges. Hibernates, but winter habitat is poorly understood.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Colorado River cotton rat	*Sigmodon arizonae plenus*	NNHP	The species is restricted to grassy habitats, including edges of ponds, along drainages, in riparian habitats, adjoining agricultural fields, and in arid grassy patches.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Álvarez-Castañeda et al. 2016

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Desert kangaroo rat	*Dipodomys desert*	NNHP, SWAP_SoCP	Desert kangaroo rats are found in low deserts, in sandy soil with sparse vegetation, or in alkali sinks. They are found in shadscale scrub and creosote bush scrub in the Lower and Upper Sonoran life zones. They are mostly restricted to deposits of deep wind-blown sand (sometimes including deposits formed as result of human activity). They nest in burrows dug in mounds, usually under vegetation.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012d
Desert pocket mouse	*Chaetodipus penicillatus*	NNHP, SWAP_SoCP	The desert pocket mouse occurs on sparsely vegetated sandy desert floors. They have a strong affinity for areas with creosote bush and saltbush and appear to prefer level terrain with fine, sandy, or light gravely soils. They have been found on rock-free bottomland soils along rivers and streams.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Fringed myotis	*Myotis thysanodes*	SP, SWAP_SoCP	Fringed myotis have been found day and night roosting in mines, caves, trees, and buildings. They are found in a wide range of habitats from low desert scrub to high elevation coniferous forests. This species hibernates in mines and caves but is capable of periodic winter activity.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Gray fox	*Urocyon cinereoargenteus*	GS	In western North America, it is commonly found in mixed agricultural/woodland/chaparral/ riparian landscapes and shrub habitats. Gray foxes occur in semi-arid areas of the south-western U.S. and northern Mexico where cover is sufficient. They appear to do well both within and on the margins of some urban areas.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Roemer et al. 2016
Great western mastiff bat	*Eumops perotis californicus*	NS	Inhabits various types of open, semi-arid to arid habitats. Rock outcroppings, cliff faces, tunnels and tall buildings are used as roosting sites.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Barquez and Diaz 2015
Hoary bat	*Lasiurus cinereus*	NNHP, NS, SWAP_SoCP	Hoary bats are a tree-roosting species, found primarily in forested upland habitats such as pinyon-juniper and conifers, as well as in gallery forest riparian zones. In Nevada, the species is known to occur at elevations between 570 and 2,520 meters amsl. Hoary bats day roost in trees 3 to 12 meters above ground and are protected by good leaf cover, but open below to facilitate flying in/out of the roost. Usually winters out of the state, but hibernating individuals have been found on tree trunks, in a tree cavity, in a squirrel's nest, and in a clump of Spanish moss.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Mexican free-tailed bat	*Tadarida brasiliensis*	NNHP, NS, SP, SWAP_SoCP	Habitat ranges from lowland deserts, shrublands, woodlands, and forests to high mountains. Major roosts are primarily in caves in the southwestern U.S.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Hibernation and foraging habitat	Not Applicable	Barquez et al. 2015

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Pale kangaroo mouse	*Microdipodops pallidus*	NNHP, NS, SP, SWAP_SoCP	This species is a highly specialized sand-obligate. It is typically restricted to fine, loose, sandy soils (with little or no gravel overlay) in valley bottoms dominated by saltbush and greasewood. It may also be found near sagebrush at its higher elevation range.	No	This species is unlikely to be present due to the Project area being outside of the species' known range.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012d
Spotted bat	*Euderma maculatum*	NNHP, NS, ST, SWAP_SoCP	Spotted bats are found in a wide variety of habitats from low-elevation desert scrub to high-elevation coniferous forests if suitable roosting habitat exists. This species primarily roosts in cracks and crevices associated with cliff faces but there is some indication that mines and caves may be occasionally used, especially in winter. This species hibernates during the winter, but periodically arouses to forage and drink.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Townsend's big-eared bat	*Corynorhinus townsendii*	SS, NS, SWAP_SoCP, NNHP	Found primarily in rural settings from deserts to lower, mid, to high-elevation mixed coniferous-deciduous forest. Distribution strongly correlated with availability of caves and abandoned mines. In Nevada, all known roost sites are in abandoned mines. Telemetry studies in northern Nevada have revealed more than 95% of foraging activity to be concentrated in open forest habitats of pinyon, juniper, mahogany, white fir, aspen and cottonwood. As a moth specialist, may travel large distances for suitable foraging area. Foraging associations include the edges of habitats along streams, adjacent to and within a variety of wooded habitats.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.	Not Applicable	Wildlife Action Plan Team 2012d
Western red bat	*Lasiurus blossevillii*	SWAP_SoCP, NNHP, NS, SS	Western red bats are primarily found in wooded habitats, including mesquite bosque and cottonwood/willow riparian areas. This species roosts in tree foliage and possibly in leaf litter on the ground. The seasonal behavior of this species is not well understood. Summer residents have been documented in the Fallon and Muddy River areas.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012d
Yuma myotis	*Myotis yumanensis*	NS	This species is found in a variety of habitats, ranging from juniper and riparian woodlands to desert regions near open water. When not near water over which to forage, they can be found roosting in caves, attics, buildings, mines, underneath bridges, and other similar structures.	No	Not likely to occur due to the lack of suitable habitat in the Project area.	Not Applicable	Not Applicable	Arroyo-Cabrales, and Álvarez-Castañeda 2008
Big Game								
Mule deer	*Odocoileus hemionus*	GS, SWAP_SoCP	Habitat use varies by season; generally, summer at higher elevations and winter at lower elevations. Mule deer prefer arid, open areas and rocky hillsides, including areas with bitterbrush and sagebrush.	No	This species is unlikely to be present due to the Project area being outside of occupied mule deer distribution.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012d
Bighorn sheep	*Ovis canadensis*	GS, SWAP_SoCP	Bighorn sheep use mesic to xeric, alpine to desert grasslands or shrub-steppe in mountains, foothills, or river canyons. Many of these grasslands are fire-maintained. Suitable escape terrain (e.g., cliffs, talus slopes) is an important feature of the habitat.	Yes	The Project area is within the NDOW-designated occupied distribution.	May occur in the Project area year-round. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	Wildlife Action Plan Team 2012d
REPTILES								

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Mojave shovel-nosed snake	*Chionactis occipitalis*	NS, SWAP_SoCP	Habitat consists of sparsely vegetated (mesquite-creosote bush, desert grasses, cactus) desert, including rocky slopes, dunes, washes, and sandy flats. Prefers flat areas with sandy soils. Feeds on various life stages of invertebrates including spiders, scorpions, and centipedes.	Yes	May occur in Project area where flat areas and sandy habitats with low densities of creosote bushes are encountered.	May occur in the Project area year-round. This species is nocturnal and much of its activity is subterranean.	Not Applicable	NatureServe 2017k
Desert glossy snake	*Arizona elegans eburnata*	NS	Habitats include barren to sparse shrubby desert, sagebrush flats, grassland, sandhills, coastal scrub, chaparral slopes, and sometimes oak-hickory woodland, generally in open areas with sandy or loamy soil.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May breed and forage in the Project area.	Not Applicable	IUCN 2017
Western banded gecko	*Coleonyx variegatus*	SWAP_SoCP	Creosote bush and sagebrush desert, pinyon-juniper belt, catclaw-cedar-grama grass association in the eastern part of range, chaparral areas in west. In rocky areas and in barren duFnes, they occur from below sea level in desert sinks to about 1,500 meters amsl.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. This species is nocturnal. It is most active just after dark, with activity declining gradually until ceasing at dawn (.	Not Applicable	NDOW no date
Mojave desert sidewinder	*Crotalus cerastes*	NS, SWAP_SoCP	Habitat includes open desert terrain with fine windblown sand, desert flats with sandy washes, or sand dunes sparsely vegetated with creosote bush or mesquite. Sometimes it occurs in rocky or gravelly sites. The sidewinder preys mainly on lizards, pocket mice, kangaroo rats, and other small mammals. In many areas, lizards are most important. Occasionally, it takes small birds and snakes. It is an active forager, but it also waits under bushes for prey, partially buried in sand.	Yes	May occur in Project area where desert flats with sandy washes or sand dunes in sparse vegetation occur.	May occur in the Project area year-round. It is primarily nocturnal, but in the early spring it is active at dusk and even occasionally during the day.	Not Applicable	NDOW no date
Great Basin collared lizard	*Crotaphytus bicinctores*	SWAP_SoCP	Occurs mainly in xeric, sparsely vegetated, rocky areas on alluvial fans, lava flows, hillsides, rocky plains, and in canyons. It perches atop rocks and hides under rocks or in rodent burrows. It can be found from sea level to about 2,280 meters amsl .	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. Inactive during cold winter weather; duration of inactive period varies with local climate. Activity among populations in northwest NV by mid-April . Evidence of Project area use was noted during 2017 surveys.	Not Applicable	NatureServe 2017k
Ring-necked snake	*Diadophis punctatus*	SWAP_SoCP	Occurs in forests, woodlands, grassland, chaparral, and riparian corridors in arid regions. Habitats are moist, at least seasonally. One or multiple individuals often are found near abandoned buildings and in junk piles in wooded areas.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. Ring-necked snakes are primarily nocturnal or highly crepuscular, though some diurnal activity has been observed.	Not Applicable	NatureServe 2017k
Desert iguana	*Dipsosaurus dorsalis*	NNHP, SWAP_SoCP	Inhabits creosote bush desert with hummocks of loose sand and patches of firm ground with scattered rocks. Its northern limit appears to coincide with that of creosote bush. Feeds mainly on vegetable matter (e.g., leaves, buds, flowers) but also eats insects and carrion. Occurs from below sea level in desert sinks to about 1,500 meters amsl.	Yes	May occur in Project area. Restricted to sandy habitats with low densities of creosote bushes.	May occur in the Project area year-round. This species is inactive during cold weather and more tolerant of high temperatures than other lizards. Desert iguanas are most active on hot, sunny days. Remains close to hatching site (usually within 40 m after 3 years).	Not Applicable	NatureServe 2017k
Long-nosed leopard lizard	*Gambelia wislizenii*	SWAP_SoCP	Found in sandy and gravelly desert and semi-desert areas with scattered shrubs or other low plants (e.g., bunch grass, alkali bush, sagebrush, creosote bush), especially areas with abundant rodent burrows. The long-nosed leopard lizard avoids densely vegetated areas that can	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. Typically not active in cold weather Evidence of Project area use was noted during 2017 surveys.	Not Applicable	NatureServe 2017k

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
			interfere with running. Occurs from sea level to approximately 1,800 meters amsl.					
Mojave desert tortoise	*Gopherus agassizii*	FT, NNHP, NS, SP, SWAP_SoCP	Occupies a variety of habitats from flats and slopes dominated by creosote bush scrub at lower elevations to rocky slopes in blackbrush and juniper woodland ecotones (transition zone) at higher elevations. Requires soils that are friable enough for digging burrows, but firm enough so that burrows do not collapse. Also uses caliche caves as shelters. Eats a wide variety of herbaceous vegetation, particularly grasses and the flowers of annual plants. They also forage on perennial grasses, woody perennials, cacti, and non-native species such as red brome and red-stem filaree.	Yes	Suitable habitat is well dispersed throughout the Project area. Can be found in vicinity where flats and slopes dominated by creosote bush are present at lower elevation and where rocky slopes in blackbrush and juniper woodlands are present at higher elevation.	Year-round resident. Much of their life is spent in burrows. In late winter or early spring, they emerge from their overwintering burrows and remain active through the fall. Evidence of Project area use was noted during 2017 surveys.	Burrow, underground.	NDOW no date, USFWS 2011a
Desert rosy boa	*Lichanura trivirgata*	NNHP, SP, SWAP_SoCP	Associated with arid and semi-arid scrublands, hillsides, rocky deserts, desert oases, canyons, talus, and other such rock-strewn regions. Often occurring near canyon and desert land streams, but they are by no means restricted to such locales. The rosy boa primarily feeds on small rodents (especially nestling mice), and occasionally shrews, nestlings of ground-dwelling birds, lizards, smaller snakes, salamanders, and anurans.	Yes	Very limited potential to occur. Can be found in vicinity where scrublands, hillsides, rocky deserts, desert oases, canyons, talus, and other such rock-strewn regions are encountered. Distribution is not fully known in Nevada.	May occur in the Project area year-round. Rosy boas are largely crepuscular and nocturnal but may be active by day during the breeding season.	Not Applicable	NatureServe 2017k
Gila monster	*Heloderma suspectum*	NNHP, NS, SP, SWAP_SoCP	Usually found in desert scrub habitats, semi-desert grassland and (more rarely) woodland communities along mountain foothills. Gila monsters frequent canyons or adjacent rocky slopes and occasionally open valleys. Their presence depends on microhabitat features such as rock crevices, boulders, burrows, and packrat middens, which this species uses for shelter.	Yes	May occur in Project area. Can be found in vicinity with desert scrub, woodland communities along mountain foothills, or adjacent rocky slopes and occasional open valleys.	May occur in the Project area year-round. It is most active from late April through June; activity rapidly declines in July. Although active, as much as 97% of its time is spent in shelters, and less than 13% of its energy budget is spent on above-ground activities.	Not Applicable	NDOW no date
Western threadsnake	*Rena humilis*	SWAP_SoCP	Habitat ranges from deserts and desert-grasslands to brush-covered mountain slopes, including rocky hillsides, canyon bottoms or washes near stream courses, riparian zones, areas near springs, and sometimes gardens and farmland. This secretive, fossorial snake sometimes can be found under rocks, wood, or debris, among plant roots, or in crevices, often in loose, damp soil.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round. This snake appears on the surface at night but may be active underground at other times. Greatest seasonal activity occurs from April to August.	Not Applicable	NatureServe 2017k
Western red-tailed skink	*Plestiodon gilberti rubricaudatus*	NNHP, SWAP_SoCP	Specimens in Nevada have been encountered in sagebrush with widely scattered junipers, the blackbrush/sagebrush ecotone, and creosote bush; all have been encountered far from permanent water.	Yes	The Project area is within the species' range, and suitable habitat may be present.		Not Applicable	NatureServe 2017k
Desert horned lizard	*Phrynosoma platyrhinos*	SWAP_SoCP	Found on sandy flats, alluvial fans, along washes, and at the edges of dunes. Sometimes found on hardpan or among rocks, but patches of sand are generally present. Associated with sagebrush, saltbush, and greasewood in the Great Basin. Generally, an ant specialist, and the bulk of their diet is made up primarily of large-bodied harvester ants. However, other items are also eaten including insects, spiders, and vegetative material. Vulnerable to impacts of	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident. Duration of active season varies with local climate. Remains underground during hot or cold weather. Hibernates in loose soil, usually emerging in April. Most active from April to July. Evidence of Project area use was noted during 2017 surveys.	Not Applicable	NatureServe 2017k

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
			habitat transition to annual grasses and weeds and the concomitant impacts to ant species composition.					
Spotted leaf-nosed snake	*Phyllorhynchus decurtatus*	SWAP_SoCP	Habitat of the spotted leaf-nosed snake generally consists of rocky, gravelly, or sandy desert plains or dunes with creosote bush.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May occur in the Project area year-round.It is active in the early evening during mild to warm weather. Greatest activity occurs from April to July.	Not Applicable	NatureServe 2017k
Common Chuckwalla	*Sauromalus ater*	NNHP, NS, SWAP_SoCP	Found in large boulder piles, lava flows, and outcrops in the Mojave Desert. Chuckwallas are strict herbivores but may unintentionally ingest insects that are on their food plants. They appear to prefer flower heads or moist leaves; annuals are preferred over perennials, but they will consume both.	Yes	May occur in Project area and vicinity where sagebrush habitat or rocky areas are present.	Year-round resident. Active March through August, emerging from brumation in spring.	Not Applicable	NDOW no date
Long-tailed brush lizard	*Urosaurus graciosus*	SWAP_SoCP	Occurs in desert washes and drainages and flat areas with loose sand and gravel from near sea level to approximately 1,070 meters amsl. It is often found on the branches of shrubs and trees including creosote bush, desert willow, palo verde, smoke tree, salt bush, galleta grass, mesquite, and catclaw acacia. May also utilize introduced fan palms and tamarisk.	Yes	The Project area is within the species' range, and suitable habitat may be present.	Year-round resident. Is usually found on branches of trees and shrubs and may dig into sand or use a burrow at night.	Not Applicable	NatureServe 2017k
Desert night lizard	*Xantusia vigilis*	SWAP_SoCP	Found primarily in desert habitats but may also range up into adjacent chaparral and lower pine woodland. It lives in and under decaying Joshua trees and various other species of yucca, Nolina, prickly pear, and pine logs. Also found under rocks and in rock crevices, beneath cow chips, soil-matted dead brush and other debris, and woodrat nests.	Yes	May occur in Project area and vicinity where fallen leaves, trunks of yuccas, agaves, cacti or other large plants or crevices of rock outcroppings are present.	Year-round resident. They are diurnal and crepuscular, but nocturnal during the warmest summer months. They are seldom found in the open away from cover.	Not Applicable	NatureServe 2017k
FISH								
Bonytail chub	*Gila elegans*	FE, NS, SS, SWAP_SCoP, NNHP	Bonytail chub are found in the main stream of the Colorado River and large tributaries, usually in or near deep swift water, in flowing pools and backwaters, over mud or rocks. They are most frequently associated with eddies just outside the main current and have a high tolerance for turbidity. They also occupy mainstem Colorado River reservoirs. Available data suggest that habitats required for conservation include river channels and flooded, ponded, or inundated riverine habitats, especially those where competition from non-native fishes is absent or reduced.	No	There are no suitable aquatic habitats for this species in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012e
Parhrump poolfish	*Empetrichthys latos*	FE, NS, SS, SWAP_SCoP, NNHP	Habitat consists of shallow warm springs, such as alkaline mineral springs and outflow streams. In natural habitat, larger individuals frequent more open deeper waters, whereas young occupy shallower more weedy areas. Females move to remote areas of springs during the breeding periods.	No	There are no suitable aquatic habitats for this species in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012e

Table 17 Habitat Evaluations for Special Status Species

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)	Potential to Occur in Project Area or Vicinity? Yes/No*	Reasoning for Occurrence Determination	Habitat Use (see explanation below)**	Nest type (ground, grass, shrub, tree, burrow, etc.)	Citations
Razorback sucker	*Xyrauchen texanus*	FE, NS, SS, SWAP_SCoP, NNHP	Habitats required by adults in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring; runs and pools often in shallow water associated with submerged sandbars in summer; and low-velocity runs, pools, and eddies in winter. Spawning in rivers occurs over bars of cobble, gravel, and sand substrates during spring runoff at widely ranging flows and water temperatures. Spawning also occurs in reservoirs over rocky shoals and shorelines. Young require nursery environments with quiet, warm, shallow water such as tributary mouths, backwaters, or in floodplain habitats in rivers, and coves or shorelines in reservoirs.	No	There are no suitable aquatic habitats for this species in the Project area.	Not Applicable	Not Applicable	Wildlife Action Plan Team 2012e
INSECTS								
MacNeill sooty wing skipper	*Hesperopsis gracielae*	NS, NNHP	This species occurs at elevations of at least 411 meters amsl in desert and chaparral/shrubland habitat adjacent to riparian areas. Larvae known to eat *Atriplex lentiformis.*	No	This species is unlikely to occur due to the lack of riparian habitat in the Project area.	Not Applicable	Not Applicable	Desert Conservation Program 2017
Moapa Warm Spring riffle beetle	*Stenelmis moapa*	NS, NNHP	This species is known to inhabit springs, streams, and wetlands at elevations of at least 518 meters amsl.	No	This species is unlikely to occur due to the lack of aquatic habitat in the Project area.	Not Applicable	Not Applicable	Desert Conservation Program 2017
Mojave gypsum bee	*Andrena balsamorhizae*	NS, NNHP	In Nevada, this species is known to occur in the Las Vegas basin. Its habitat is restricted to habitat of its host plant, *Enceliopsis argophlla*.	No	This species is unlikely to be present due to the Project area being outside of the species' known range.	Not Applicable	Not Applicable	Desert Conservation Program 2017
Mojave poppy bee	*Perdita meconis*	NS, NNHP	Restricted to the habitat of plants of the poppy family, including *Arctomecon* and *Argemone,* in the Mojave Desert.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May use the Project area for breeding and foraging	Not Applicable	Desert Conservation Program 2017
Northern Mojave blue	*Euphilotes mojave virginensis*	NS, NNHP	Habitat is dry desert washes and sandy areas. Restricted to habitat of buckwheat (*Eriogonum*) species.	Yes	The Project area is within the species' range, and suitable habitat may be present.	May use the Project area for breeding and foraging	Not Applicable	Xerces Society of Invertebrate Conservation no date
MOLLUSCS								
Spring Mountains pyrg	*Pyrgulopsis deaconi*	NS, NNHP, SWAP_SoCP	This aquatic species is known to occur in the Las Vegas and Pahrump Valleys in Clark County, Nevada at elevations between 850 and 1,580 meters amsl.	No	Not likely to occur due to the lack of aquatic habitat in the Project area.	Not Applicable	Not Applicable	USFWS 2011

Notes:

** Habitat Use: List type of use (e.g., year 'round, breeding, migration, foraging) and dates on which species would most likely be present for that activity. Breeding activities include dates of arrival through post-fledging dependency for birds. Denote probable nesting/parturition dates in parentheses for all animals. For plants, list dates of emergence through senescence with optimal flowering times in parentheses.

Status Codes

BGEPA = Federally protected under Bald and Golden Eagle Protection Act
BCC = Bird of Conservation Concern (Region 33)
FE = Federally listed endangered
FT = Federally listed threatened
FP = Federally listed proposed
FC = Federally listed candidate
FS = Designated as sensitive by the USDA Forest Service
GS = Game species, Furbearer
MBTA = Federally protected under the Migratory Bird Treaty Act
NNHP = Ranked as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable) by Nevada Natural Heritage Program
NS = Nevada BLM sensitive species
SE = State listed endangered
ST = State listed threatened
SP = State protected
SS = State sensitive
SWAP_SoCP = Nevada State Wildlife Action Plan (2012) Species of Conservation Priority

Table 18 Acres of Impacts to Desert Tortoise Functional Habitat by Project Phase[a]

Disturbance Type	Total Project Area (acres) BLM-Administered Land and Non-BLM Land[b]			Total Project Area (acres) on BLM Land[c]			Functional Desert Tortoise Habitat (acres) BLM-Administered Land and Non-BLM Land[d]			Functional Desert Tortoise Habitat (acres) on BLM Land[d]		
	Phase I	Phase II	Phase I	Phase I	Phase II	Phase III	Phase I	Phase II	Phase III	Phase I	Phase II	Phase III
Existing Permanent Pipeline Right-of-way	251.39	150.47	157.62	157.62	66.67	254.42	83.75	0	45.88	52.19	0	45.88
TUP/Temporary Easement Pipeline Workspace	242.80	113.06	160.59	160.59	49.55	232.01	242.8	113.06	258.95	160.6	49.55	232.01
TUP/Temporary Easement Staging Areas[e]	17.68	7.48[e]	12.44	12.44	3.46	13.32	17.68	7.48	20.89	12.44	3.46	13.32
TUP/Temporary Easement Access Roads[f]	26.18	25.16	12.74 [g]	12.74 [g]	4.18	45.61	0	0	0	0	0	0
Total Acreages by Phase	**538.05**	**296.17**	**343.39**	**343.39**	**123.87**	**545.36**	**344.23**	**120.54**	**325.72**	**225.23**	**53.02**	**291.21**
Totals Acreages	**1,450.69**			**1,012.61**			**790.49**			**569.46**		

Notes:

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends in this table.

b The Project area represents the total acres of land utilized for the Project and includes existing permanent ROW, TUP/temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads on both BLM-Administered Land and Non-BLM Land.

c The new 4-inch-diameter polyethylene (PE) pipe is included in the Phase I Existing Permanent ROW calculation and includes a 50-foot wide disturbance for a length of 2.89 miles. Disturbance is not included where the PE pipe ROW overlaps with an existing road.

d Arcadis and SWG had a number of conversations with BLM representatives about the expected Project disturbance and anticipated impacts on Mojave desert tortoise. On November 7, 2019, representatives from Arcadis and SWG met with the BLM specialists along the northern portion of the Project area to review the existing disturbance within SWG's permanent ROW and determine how disturbance should be accounted for in the description and calculation of the Project disturbance impacts. During that site visit, the group discussed how the Project disturbance should be analyzed and described in the Project NEPA analysis and Endangered Species Act (ESA) consultation. During the November site visit with the BLM specialists, discussions focused on two categories of habitat: previously disturbed (e.g., SWG's permanent ROW, which was disturbed more than 50 years ago for the installation of the existing pipelines) and undisturbed (e.g., areas of new disturbance). It was apparent during the site visit that portions of the SWG's permanent ROW for the Project had recovered since the initial disturbance associated with the installation of the existing pipelines. As such, the BLM discussed with Arcadis and SWG the potential of classifying these recovered areas as functional desert tortoise habitat. Functional desert tortoise habitat is the total Project area minus non-functional desert tortoise habitat (Arcadis 2020b).

e TUP/Temporary Easement Staging Area 1 would be used in Phase I and III. Acres of total Project Area associated with TUP/Temporary Easement Staging Area 1 is only included in Phase I. TUP/Temporary Easement Staging Area 8 would be used in Phase I and II. Acres of total Project Area associated with TUP/Temporary Easement Staging Area 8 is only included in Phase I.

f All access to the Project would be via existing roads. Minor improvements to some roads are anticipated; however, improvements would not result in additional loss to desert tortoise functional habitat and as such TUP/temporary easement access roads are not considered functional desert tortoise habitat disturbance and is not included in the total surface disturbance acreage calculated for the Project.

g TUP/Temporary Easement Access Road 1 will be used in Phase I and III. Acres of total Project area associated with TUP/Temporary Easement Access Road 1 is only included in Phase I. TUP/Temporary Easement Access Road 10 would be used in Phase I and II. Acres of total Project area associated with TUP/Temporary Easement Access Road 10 is only included in Phase I. The Project area represents the total acres of land utilized for the Project and includes existing permanent ROW, TUP/temporary easement pipeline workspace, TUP/temporary easement staging areas, and TUP/temporary easement access roads on both BLM-Administered Land and Non-BLM Land.

Table 19 Acreage within VRM Classes

VRM Class	Acreage
VRM Class I	47,562182,858
VRM Class II	917,200926,307
VRM Class III	1,622,226861,436
VRM Class IV	523,2971,137,995

Source: BLM 2014

Table 20 Annual Average Daily Traffic

Station ID	County	Location	Number of Vehicles 2012	Number of Vehicles 2013	Number of Vehicles 2014	Number of Vehicles 2015
0033160	Clark	Laughlin Highway/Route 163	4,100	4,100	4,100	4,300
0030237	Clark	Nipton Road/Route 164	750	600	700	550
0033130	Clark	US-95 – north of Searchlight	6,200	6,300	6,500	6,700
0035400	Clark	US-95 – south of Henderson	-	-	7,100	7,400
0030909	Clark	I-515	50,000	51,500	50,000	57,000

Source: NDOT 2017

APPENDIX B

CONSTRUCTION, OPERATIONS, AND MAINTENANCE OF THE PROPOSED FACILITIES

B. Construction, Operations, and Maintenance of the Proposed Facilities

B1 Construction Description

Southwest Gas Corporation (SWG) would use standard mainline construction methods to install the pipeline. These methods include clearing, grading, trenching, pipe stringing, pipe bending, welding, joint coating, padding, lowering-in, backfilling, hydrostatic testing, cleanup, and restoration. These methods are summarized below.

Beyond standard pipeline construction methods, SWG proposes to use special construction techniques where warranted by site-specific conditions, such as where the Project crosses rugged topography, faults, roads, utilities, and waterbodies. However, no blasting is anticipated to be required for the Project. SWG would minimize construction impacts by implementing Project Plans designed to mitigate impacts.

All pipeline road crossings would be constructed in compliance with the requirements of the appropriate federal, state, and local agencies. Roadways would be open-cut or bored, depending on the requirement of the governing agency. Unpaved roads would generally be crossed in 1 day. Where the pipeline would be installed under the paved road surface, via open-cut methods, SWG will maintain traffic flow and install steel plates or resurface the area at the end of the workday. A Traffic Control Plan would be implemented for all road cuts in accordance with county or city regulations.

SWG anticipates that the construction would be conducted between the months of November to March. However, there is a potential that work would occur during the spring and summer months. Prior to construction, SWG may also apply herbicide, as needed, to noxious and invasive weeds. If applied, herbicides that may be used will comply with the *Reinitiation of Formal Consultation for the Programmatic Biological Opinion for the BLM Southern Nevada District Office, Nevada (File No. 84320-2010-F-0365)*. These herbicides are considered to have very low toxicity to mammals, birds, and fish when applied in accordance with all product label requirements and restrictions.

B1.1 Pipe Storage

Required construction materials would be stored until needed at the existing facilities of contractors and suppliers that provide equipment, supplies, or labor to the Project. The new pipe would typically be stored at a vendor's coating yard until it is loaded onto trucks for stringing along the route. Pipe would then be stored on site at the various staging areas and strung along the trench before welding and lowering into the trench. Aggregate, asphalt, sand, and slurry materials needed for the Project would be purchased locally, and materials would be stored along the ROW in designated staging areas. Construction equipment would be delivered to designated staging areas or directly to the ROW by truck. Contractor equipment would be stored on the ROW overnight in open terrain and where permitted along the ROW.

B1.2 Access Roads and Stockpiles

Construction traffic during Project work would be limited to existing public roads, designated access roads, and the Project ROW.

Equipment, personnel, and materials would be transported along the pipeline ROW or along designated approved access roads where the pipeline route deviates from existing roadways. SWG would restrict these activities to the areas within the boundaries of the construction ROWs as described in **Section B1.3**. SWG does not anticipate any need for turnaround areas outside of the ROWs and staging areas. Equipment refueling trucks would enter all access roads and work areas from existing public roadways.

B1.3 Staking of Right-of-Way

SWG would establish the centerline of the pipeline ROW and all points of intersection tangents by staking in areas of open construction and by appropriate markings within existing ROWs (for example, street ROW). The construction contractor would maintain this reference of the ROW and ensure that the construction disturbance remains within the ROW. The contractor would stake and flag buried utilities on the ROW to ensure that they are not damaged. TUP/temporary easement staging areas would also be clearly staked and flagged. SWG would stake the boundaries of the entire construction ROW on private and public lands. All construction work areas would be identified and staked before the start of construction.

B1.4 Clearing and Grading

The ROW clearing would be limited to the smallest area possible that still provides safe and efficient work areas for all phases of pipeline construction. The ROW would be cleared by mowing and grading as necessary. Where possible, trees would be avoided or, if needed, side-trimmed. All clearing and grading would occur in accordance with the Bureau of Land Management (BLM) guidelines and would include cactus and yucca salvage (BLM 2011).

The SNDO restoration plan guidance (BLM 2019), describes disturbance levels based on the intensities of the effects of Project activities will have on habitat within the Project area including vegetation removal, soil compaction, and soil removal. Below is a summary of the disturbance levels including the anticipated Project activity within each level.

Mowing – Mowing has the lowest impact of the four disturbance levels and includes no soil disturbance or compaction. Vegetation is mowed to 16 inches or greater with minimal crushing of vegetation. Cacti and yucca are left in place in this level; however, yucca may be cut or ground down to 16 inches and cacti (primarily Cylindropuntia spp.) taller than 16 inches may be cut to 16 inches with the cut portion left on the ground.

Overland Drive and Crush – The next level does not include vegetation cutting; however, vegetation is crushed by equipment, vehicles, and foot-traffic. Soil is compacted, but no surface soil is removed, therefore keeping the seed bank in place. This level also includes mowing vegetation to less than 16 inches

Clear and Cut – This level includes the removal of vegetation, the compaction of soil, but no soil surface removal. Vegetation is cut to the ground surface, but roots are not removed.

Clear and Cut with Soil Removal – This level, the most intense of the four levels, includes the removal of all vegetation in the Project area, soils are compacted, surface soil is removed, as well as subsurface soils in the case of underground utility installation.

Vegetation removal, grading and soil removal would be required to allow for safe excavation and pipeline installation to create a level workspace, to provide adequate access and safe working conditions for workers, and for equipment and vehicle operation. Typically, bulldozers or graders are used for grading operations. Clearing and grading activities will consist of Overland Drive and Crush, Clear and Cut, and Clear and Cut with Soil Removal. Within the permanent pipeline ROW an 8-foot-wide corridor directly over the proposed pipeline would be cleared utilizing Clear and Cut with Soil Removal to allow for trench excavation and pipeline installation. The remaining portions of the permanent pipeline ROW and TUP/temporary easement staging areas are anticipated to utilize Overland Drive and Crush. TUP/temporary easement pipeline workspace and TUP/temporary easement for three access roads where additional improvements are would utilize Clear and Cut to allow for safe operation of equipment

and materials storage. The Spoils (subsoil) from grading operations along the 8-foot-wide pipeline trench would be stockpiled adjacent to the trench.

Where possible, grading may be minimized by detouring non-essential equipment around areas of excessively steep slopes using an approved TUP/temporary easement access road or bypass.

Table B.1 summarizes the total number of acres on BLM-administered lands evaluated at each disturbance levels that will require restoration.

Table B.1 Permanent and Temporary Impact Totals from Project Activities on BLM-administered Lands by Disturbance Level

Level by Phase	**Permanent Pipeline Right-of-Way[1]**			**TUP/Temporary Easement Pipeline Workspace**			**TUP/ Temporary Easement Staging Areas**			**Total Restoration Acres** on BLM-administered Land			
	I	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**	**Total Project[2]**
Overland Drive and Crush	106.25	47.76	166.53				12.06	3.46	13.32	109.27	43.61	176.98	329.86
Clear and Cut				159.36	49.55	231.97				159.36	49.55	231.97	440.88
Clear and Cut with Soil Removal	17.43	5.28	25.15							26.47	12.89	28.02	67.39
Total	123.68	53.04	191.69	159.36	49.55	231.97	12.06	3.46	13.32	295.10	106.05	436.98	838.13

Notes:

1 Clear and Cut with Soil Removal impacts to the permanent pipeline ROW are based on an assumed 8-foot wide corridor directly over the proposed pipeline. The areas of existing disturbance associated with the existing access road adjacent to the existing pipelines was not included in the impact acreage calculation for Clear and Cut with Soil Removal within the permanent pipeline ROW.

2 Improvements to existing access roads will not be reclaimed. A total of 7.25 acres of Project impacts are anticipated along existing access roads.

B1.5 Stringing

The pipe lengths would be strung end-to-end on the ROW in preparation for bending, welding, and laying into the trench. Pipe would be strung so that it does not block passage of vehicles or wildlife across the ROW. Gaps left in stringing would correspond with gaps left in the trench for this purpose.

B1.6 Trenching

The trench would be excavated to a depth sufficient to bury the pipeline at a depth that meets or exceeds U.S. Department of Transportation (USDOT) requirements for cover. Based on the proposed pipeline diameters, the width of the trench would typically be about 36 inches.

Upland areas are typically trenched using a trenching machine or excavator. An excavator is generally used for drainage crossings. Shallow soil may be underlain with bedrock, or bedrock may be exposed at the surface, in some of the areas to be affected by the installation of the pipeline. Removal of solid rock from the trench line may require use of a hydraulic chisel or a rock saw. Blasting is not anticipated to be required for this Project. Where loose rock is encountered, a ripper may be used ahead of the excavators.

Underground pipelines and utility lines crossed by the proposed pipeline would be identified and clearly flagged or marked before constructing in an area. Utility and pipeline owners would be notified of the impending construction and would be requested to locate and uncover the lines or to be present during construction. The exact locations of these utilities would be identified by hand excavation or vacuum truck.

Unexcavated portions of the trench line would be spaced at suitable intervals, as requested by permitting agencies or landowners, and at all well-defined trails to allow passage of vehicles and wildlife. Gaps would also be left in the spoil piles across drainages to accommodate surface water runoff.

B1.7 Bending and Lying

This operation starts with a bending engineer, who measures the angles and tangents of the trench and calculates the required bend degree and orientation required for each length of pipe. This procedure would ensure that the pipeline fits the contours of the trench line with sufficient slack for expansion and contraction when the segments are welded together and placed in the trench. An operator would place the pipe length in a bending machine, form the bend, and then return the pipe to its proper space for welding.

B1.8 Welding

Welding would be performed by manual electric arc butt welding in accordance with qualified procedures. The welding crew would prepare and align the pipe joints and complete welding in two operations; the first completing the stringer bead and the hot pass, and the second completing the filler beads and cap. Welds will be radiographically inspected (x-rayed) and any required repairs made in accordance with USDOT regulations in Title 49 CFR Part 192.

The contractor would take all precautionary measures to reduce the chance of igniting a fire. Precautions would include placing a fire-resistant mat on the ground below welding and grinding operations whenever dry vegetation is present.

B1.9 Joint Coating

After the pipe is welded, and welds are radiographically inspected, shrink sleeves or other appropriate materials would be used to protect the joint. All coated pipe, including all field joints, fittings, and bends, would be tested and repaired as necessary after the pipe is in place and before backfilling.

B1.10 Backfilling

Backfilling procedures would incorporate techniques to protect the pipe and coating from damage and to prevent erosion of backfill material. After the pipe is installed, excavated spoil material would be used to cover the pipe. Trench spoils may be backfilled directly into the trench in areas where the spoils are composed of soft and loose earthen material and are free of rocks and hard clods. In rocky areas, padding material (consisting of original trench spoils screened of rock or of imported, rock-free fill material) would be used to cover and protect the pipeline and coating from rocks. The remaining trench spoils would be backfilled after padding is completed. After the trench is filled to ground level, the backfill would be compacted.

Cleanup operations would commence immediately following backfilling operations. Construction debris would be removed from all construction work areas unless the landowner or land managing agency otherwise approves leaving materials on site for beneficial reuse, stabilization, or habitat restoration. Materials unsuitable for use as backfill and that are economically not usable for other purposes will be disposed of in accordance with local and county guidelines in available landfills. Disposal would be in accordance with applicable federal, state, and local rules.

B1.11 Restoration of Topography

After backfilling, all graded areas would be restored to as near the natural or pre-existing grade as practicable. However, steep cuts may be restored to a stable position and protected by appropriate erosion control measures in areas of erosive soils or slopes with potential for mass wasting (i.e., slumping or landslides). These locations may not be known until on-site inspections are conducted during construction.

Excess spoils from the trench may remain after backfilling and regrading is completed and may be spread evenly across the graded areas of the ROW. Otherwise, excess spoils would be removed from the ROW and disposed of in an area acceptable to the landowner or appropriate government agency and in accordance with applicable laws, rules, and regulations. In upland areas, a berm or crown about 8 inches high on center may be left temporarily over the trench line to allow for additional settling.

Once recontouring is complete, subsoil compaction of work areas would be relieved by ripping, discing, or chisel plowing, unless otherwise directed by the landowner or appropriate government agency. Excess rock, or other mineral, would be removed with a BLM Free Use Permit and disposed of at an approved location or as directed by the landowner or appropriate government agency.

Discing or other means of tilling should parallel the contours of slopes. The ROW would be left in a roughened condition to minimize the erosive effects of water and wind and to provide a seed bed for revegetation.

Where necessary, permanent slope breakers would be constructed to stabilize upstream or upslope areas, and to divert surface water away from the backfilled trench and into stable, well vegetated areas. These measures would prevent channeling along the trench line on hillsides or sloping ground. Temporary sediment barriers would be removed when replaced by permanent erosion control measures or when revegetation is successful.

B1.12 Revegetation

The principal objective of revegetation is to control erosion and sediment by establishing a permanent vegetative cover over disturbed areas. Re-establishment of vegetation would also reduce the visual impacts of the pipeline corridor. A vegetative cover composed of compatible native species, similar in composition to pre-construction conditions, would be re-established. SWG would develop a Restoration and Revegetation Plan for the Project, which would include post-construction monitoring inspection of the construction ROW. Wherever possible, SWG would make efforts to replace cacti and yucca salvaged during clearing and grading in accordance with BLM guidelines (BLM 2011). Restoration is planned for all areas of disturbance with the exception of existing access roads and improved areas of existing access roads.

Mulching aids, tackifying agents, and other erosion control materials may aid in retention of soil moisture and minimize soil erosion by wind and water. Mulching or tackifying may be employed in areas of extreme exposure to wind, unstable slopes, or highly erodible soils. Weed-free straw would be used as mulch or as directed by the landowner. Mulch will be anchored to the ground using a crimper or disc. In some cases, an erosion control blanket may be used on unstable slopes.

B1.13 Road Crossings

All public road crossings would be installed following the permit drawings and specifications. The open-cut method would be employed unless otherwise stipulated by a permit. There are four identified horizontal directional drilling (HDD) road crossings at Needles Highway (Project milepost 0.05), Highway 163 crossing (Project milepost 11.1), U.S. 95 (Project milepost 29.9) and Joshua Tree Highway (State Route 164; Project milepost 33.32). Unless otherwise required, crossings would be uncased. Where casings are specified, the casings would be electrically insulated from the carrier pipe, and the traditional jack and bore installation may be implemented.

At road crossings, safety measures to safeguard the public would be used, including an adequate number of flagmen, barriers, warning signs, lights, and walkways around the work area. All roads will be kept open, or a suitable bypass road would be available to keep traffic moving during installation of the pipe and restoration of the road.

Open-cut installations at non-paved road crossings would be backfilled and compacted to a specified density that is equal to or exceeds the density of the surrounding undisturbed earth. The surface of the road would be replaced as specified on the permit.

B1.14 Drainage Crossings

The pipeline would not cross any perennial waterbodies. The pipeline would be installed by open-cut at all drainage crossings. The drainages would likely be crossed during the normal period of no flow. The pipeline would be buried at a depth sufficient to provide a minimum of 48 to 60 inches of cover below the probable scour depth of the 100-year flood event calculated at that crossing. Should there be perceptible flow within the drainage at the time of crossing, SWG would utilize best management practices (BMPs) as approved by the BLM and local agencies such as limiting the duration of in-stream construction activities, limiting soil compaction in and around the drainage, installing temporary bridges or mats where practicable, and implementing a Project-specific Spill Prevention, Control, and Countermeasure (SPCC) Plan.

B1.15 Hydrostatic Testing

Once a pipeline segment is in place, the new pipe would be tested with pressurized water to locate any leaks or weak spots. Each new pipeline segment would likely be hydrostatically tested in multiple segments depending on elevation differences. During the hydrostatic test, a test section would be filled with fresh water from authorized intake points. Once the test section is filled, the pipe would be pressurized to at least 150 percent of the design maximum allowable operating pressure (MAOP) for the pipeline for a minimum of 8 hours. If leaks are detected during the test, defective pipe sections would be replaced, and the section would be retested until specifications are met.

The maximum amount of water required for the hydrostatic testing for the entire Project would be approximately 8,011,750 gallons (gal). It is not anticipated that all the water would be needed for the hydrostatic testing. The water requirements for the three phases are as follows:

- Phase I: 3,144,146 gal
- Phase II: 1,490,558 gal
- Phase III: 3,377,046 gal

The hydrostatic test water would be obtained from a municipal source. SWG would coordinate with Henderson, Boulder City, Searchlight, and Bullhead City regarding water use for the Project. SWG would apply for a permit for water use for the Project with these entities. To reduce the overall water requirements, test water would be reused as dust control along the ROW.

Once the pipe segment is tested, the test water will be collected in trucks and used for dust control and revegetation along the pipeline ROW. Discharge rates would be controlled by operating valves at the end of the water truck. Test water would be discharged in accordance with all federal, state, and local requirements and BMPs for protection of water quality and stream flows when applied to the ROW as dust abatement. No rust inhibitors would be added to the test water, and the water discharged would only contain minor amounts of sediment and iron oxide from the weld areas. The discharge rate would be regulated, and appropriate BMPs would be used to prevent erosion, streambed scour, suspension of sediment, and excessive stream flow. Discharge water samples would be collected and analyzed in accordance with National Pollutant Discharge Elimination System (NPDES) permit conditions established by Nevada Division of Environmental Protection (NDEP).

B1.16 Abandonment of Pipe

Phase I of construction would allow the decommissioning of the existing low-pressure pipelines for the entirety of the Project (milepost 0.0 to 69.5) and these pipelines would be abandoned in place. As part of the

abandonment process SWG would cut and cap the abandoned pipelines approximately every mile. This would include a segment of pipeline east of Searchlight. The cutting and capping of the abandoned 500 psig pipeline, from Intersection Point Station to Horizon Ridge PLS, would likely occur during Phase I. The cutting and capping of the 650 psig and 720 psig pipelines would happen phase by phase as the new main replaces the existing pipelines. Cutting and capping would require an approximate 8-foot by 8-foot bell hole at each cut and cap location. The 40-foot by 60-foot disturbance area would include space for equipment to access the existing pipelines and dig an approximately 8-foot by 8-foot bell hole providing access for the construction crew to the existing pipelines to cut and cap. Ground disturbance should be limited to the bell hole area although additional space has been identified to allow for equipment access. All of the cutting and capping locations on the east side of Searchlight would be accessed along the existing Pipeline Road (Access Road 22). The cutting and capping on the east side of Searchlight would result in a total of 0.44 acre of impacts.

B1.17 Asbestos

Asbestos-containing materials are likely present on the existing pipelines. The existing pipe may be exposed at the upstream and downstream tie-in locations for the proposed Project.

Where existing pipeline exhibiting asbestos-containing material is exposed, SWG would follow proper asbestos abatement procedures and construction worker protection protocols as outlined by the Nevada Division of Industrial Relations, the U.S. Environmental Protection Agency (USEPA) Region 9.

Additional information regarding naturally occurring asbestos (NOA) found in the Project area is discussed in **Section 3.2** of the Environmental Assessment.

B1.18 Work Force and Vehicles

Each construction spread consists of 12 to 15 personnel. The construction contractor would determine the number of construction spreads needed. During full-scale construction, SWG estimates the work force to be 30 to 60 personnel (or two to four construction spreads) for each phase of construction. The construction contractor would make the final decision on timing and duration of the various aspects of the construction schedule, consistent with any biological seasonal restrictions.

Typical vehicles would include light- and medium-duty trucks to transport employees and light equipment along the ROW. Equipment and vehicles used during mainline construction activities would include heavy-duty equipment (including excavators, backhoes, dozers, graders, loaders, sidebooms, equipment haulers, cranes, dump trucks, tack rigs, fuel and water trucks, and personnel carriers), medium-duty trucks, and light-duty vehicles.

No known special equipment would be used during the construction of this project.

SWG would also have a pipeline inspector on site, and at times, an engineer would also be present. SWG would provide regular oversight of construction activity to review compliance with all other relevant federal, state, and local permits, as required. Each inspector or engineer would have a light-duty truck for personal transportation along the pipeline route.

B2 Safety Requirements

Southwest Gas would design, construct, operate, and maintain the proposed facilities in accordance with USDOT regulations at Title 49 CFR Part 192, "Transportation of Natural Gas and Other Gas by Pipeline; Minimum Federal Safety Standards," and other applicable federal and state regulations. The standards imposed are in accordance with the Natural Gas Pipeline Safety Act of 1968, as amended.

During the construction of the Project, SWG's contractor (and any subcontractors) would be required to follow all applicable Occupational Safety and Health Administration (OSHA) safety standards and all SWG

safety standards and procedures. These standards include special safety procedures to follow whenever workspace is within 25 feet of a residential or commercial building.

SWG's operation and maintenance activities include routine visits to perform activities such as safety inspections and monitoring, pigging and integrity management activities, cathodic protection maintenance and repair, and replacement and maintenance of components such as regulators and valves.

The proposed pipelines would be added to SWG's existing pipeline inspection program. Continuing surveillance of SWG's pipeline system is conducted in accordance with USDOT requirements to determine the appropriate action concerning possible changes in class location, failures, USDOT notification, leakage history, corrosion, substantial changes in cathodic protection requirements, and other unusual operating conditions. Operation and maintenance activities would also conform to all relevant safety regulations, as well as SWG's safety and emergency plan manuals.

B3 Industrial Waste and Toxic Substances

Moderate amounts of fuels, such as gasoline and/or diesel fuel, as well as various oils and lubrications, would be used and stored along the pipeline work area. SWG would develop a Spill Prevention and Response Plan (SPRP), specifically designed for this Project, that will be followed throughout the entire construction and restoration process. All construction personnel would be trained on the SPRP, and work would be overseen to ensure it is properly and consistently observed during the Project.

B4 Soil Stabilization and Rehabilitation

SWG would develop a project-specific Restoration and Revegetation Plan using BLM's Restoration Plan Template, and all lands impacted by construction of the Project would be restored in accordance with this Plan. The Plan would document the erosion control, revegetation, and maintenance actions that would be undertaken as part of the Project. The Restoration and Revegetation Plan would address the short-term stabilization and long-term reclamation of Project areas.

B4.1 Restoration and Revegetation Plan

General categories of measures to be implemented for restoration and revegetation include recontouring, soil stabilization, seedbed preparation, seeding, and monitoring. Restoration and revegetation of the disturbed soil surface area would be implemented and completed as outlined in the Project's Restoration and Revegetation Plan that would be developed by SWG. The Restoration and Revegetation Plan would include guidelines for cacti and yucca salvage in accordance with BLM guidelines.

The short-term objective of restoration and revegetation is to establish vegetation for the control of erosion and to help prevent the invasion of noxious weeds.

The long-term objective of restoration and revegetation is to establish a self-perpetuating set of plant associations compatible with, and capable of, supporting pre-disturbance land uses.

B4.2 Permanent Erosion Control

Stabilization measures would be initiated as soon as practicable. Final grading and permanent erosion control structures would be completed after backfilling the trench. Permanent slope breakers or terraces would be constructed across the ROW on sloping ground to prevent erosion, following spacing guidelines in the Project Stormwater Pollution Prevention Plan (SWPPP) that SWG would develop. On steep grades, earth-filled sacks or stone riprap may be necessary to stabilize the ground surface. Erosion control matting would be used as appropriate on all drainages to ensure bank stability.

B4.3 Mitigation of Soil Compaction

If indicated by soil compaction tests, using a cone penetrometer or other appropriate device, all compacted portions of the Project area, including temporary and permanent ROW, TUP/temporary easement access roads, TUP/temporary easement pipeline workspaces, and TUP/temporary easement staging areas that are to be restored and revegetated would be ripped to a depth of 6 to 18 inches unless solid rock is shallower. Where possible, ripping would take place along the contour on sloped portions of the ROW. Care will be taken to avoid damaging erosion control structures, such as slope breakers, terraces, and other measures, during ripping.

B4.4 Revegetation

Areas cleared of vegetation or disturbed during construction would be minimized to the smallest possible footprint. Where possible, protective orange fencing would be installed around mature trees within the construction corridor to protect the trees. Cacti and yucca would be salvaged in accordance with BLM guidelines.

As feasible, SWG would allow for vegetation to be preserved along the banks of drainages where the pipeline crosses. The construction contractor would determine in the field what vegetation would be removed based on safety and construction considerations.

B5 Vegetation Disposal

All vegetative material (trees, shrubs, and other plants) would be removed from the Project during clearing of the construction ROW and properly disposed in accordance with BLM guidelines, at approved facilities, or used for erosion control. Vegetative debris may be chipped or disposed of according to applicable regulations and landowner/land-manager agreement. Materials taken off site would be disposed of at commercial facilities or at other locations approved by the appropriate regulating agencies. Stumps, large rocks, and other vegetation debris that would interfere with restoration activities, such as seedbed preparation, would be removed from the ROW and disposed of appropriately. Vegetation and other debris would not be mixed with backfill.

B6 Seeding Specifications

SWG would develop a project-specific Restoration and Revegetation Plan that would identify the recommended seeding species, methods, and dates.

B6.1 Timing

If seeding cannot be completed before the beginning of the rainy season, it would be accomplished as soon as possible thereafter. If not completed by late winter, seeding may be deferred until the following fall, and additional mechanical erosion control measures, such as mulching and/or surface roughening, may be applied to the ROW. In the period between completion of construction activities and seeding, mechanical methods of erosion control would be used to minimize soil erosion.

B6.2 Mechanical Seedbed Preparation

If the seedbed in areas to be revegetated has crusted over or otherwise become sealed, the seed bed would be prepared by discing or other mechanical means sufficient to allow penetration of seed into the soil. Mechanical seedbed preparation using harrows or discs pulled behind a tractor or small bulldozer would be conducted wherever seeding takes place. Mechanical seedbed preparation may not be required in areas where seeding would be carried out using a rangeland drill. Determination of the appropriate mechanism for seedbed preparation would be made by the reclamation contractor. The purpose of this procedure is to relieve compaction, break up large blocks of soil, and prepare the soil surface for planting. Seedbed

preparation would take place along the contour on sloped portions of the ROW. Care will be taken to avoid damaging erosion control structures, such as slope breakers and terraces, during seedbed preparation.

Areas that would not be reseeded, such as access roads and other areas that are to be maintained free of vegetation, would not be subject to mechanical seedbed preparation.

B6.3 Plant Material Recommendations

Seed mixes would be developed in consultation with the Natural Resource Conservation Service (NRCS), the BLM, Clark County, and other landowners as applicable. Native, local species would be used to the extent that they are commercially available. Individual private landowners may specify other seed mixes, which would be used as requested.

B6.4 Seeding

Seeding would be accomplished by broadcasting, use of a rangeland drill, or use of a hydroseeder depending on the topography and slope of the terrain. Drill seeding is the preferred seeding method. Broadcast seeding or hydroseeding may be used where drill seeding is not effective because of steep slopes, rocky soils, or other factors. The reclamation contractor would use a seed drill capable of correctly planting the various types of seeds included in the specified seed mixes. Use of specially modified drills may be necessary to ensure that all seeds, regardless of size, are planted at the appropriate depth. Multiple seed boxes for different types of seed would be necessary. Agitators, picker wheels, and larger seed tubes may be necessary to correctly handle and plant fluffy seed.

Hydroseeding would be used in areas too steep for rangeland drills or where the additional erosion control and mulch provided by this method is preferred. Water, wood or other weed-free fiber, and a tackifier (as approved by the land managing agency or landowner) would be added to the seed to ensure complete coverage of areas selected for hydroseeding.

All reclamation equipment would be cleaned before use in the Project area to eliminate the potential for spread of noxious weeds or other undesirable non-native species. Additionally, per BLM requirements, any non-native fill or hay/straw used on the Project would be certified weed-free. All leftover seed from previous restoration projects would be removed from seeding equipment before use on the Project.

B6.5 Protection of Restored and Revegetated Areas

Mulching may be used on slopes and other areas concurrently with, or immediately after seeding where necessary, to stabilize the soil surface and to reduce wind and water erosion. Materials to be used for mulch include weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent. Various combinations of these types of mulch may be used on the ROW. Any mulch materials applied on BLM lands and at drainage crossings are required to be certified weed-free. The specific combination of mulch materials used on private land would depend on the preferences of the landowners. When determined that the application is needed, only certified weed-free straw mulch would be applied at a rate of 2 tons per acre. Mulch would be spread uniformly to cover a minimum of 75 percent of the ground surface, and would be crimped or disced in. As discussed above, hydromulch with a tackifier may be used for seeding and mulching in some areas.

To limit impacts to restoration and revegetation from off-road vehicles, signs may be posted along the ROW, as appropriate. Posted signage would communicate "keep off" the ROW and that "revegetation is in progress." Some areas may have temporary fences to limit access to the ROW, and other areas may be roughened to discourage non-essential vehicles from traveling on the ROW.

B6.6 Fertilizer

A fertilizer would likely not be applied during seeding. Fertilizer could be applied during the post-construction monitoring period, which would allow for an assessment of the function of erosion control devices and of the success of revegetation. If needed, maintenance activities would modify or replace erosion control devices to ensure that they continue to function properly. Areas of unsuccessful revegetation would be re-worked. Post-construction monitoring would focus on compliance with permit stipulations and success of restoration activities. Records identifying dates of backfilling and seeding; fertilizer applications, if any; acreage revegetated; and the same information for landowners requesting special seeding treatments would be kept.

B7 Limiting Access to the Right-of-Way

After seeding, access to the ROW would be limited to areas where seed is not applied, such as access roads and other areas that are to be maintained free of vegetation. Access to areas that have been seeded would be limited to preserve the seed and help ensure germination. See **Section C1.11** *Restoration of Topography*.

B8 Operations and Maintenance

SWG would operate and maintain the pipeline confined within the acquired permanent ROW permits and BLM grants. SWG would commence with operation and maintenance activities as soon as construction activities are completed following the Project Plans as well as in accordance with the USDOT regulations at Title 49 CFR Part 192, "Transportation of Natural Gas and Other Gas by Pipeline; Minimum Federal Safety Standards," and other applicable federal and state regulations.

SWG estimates the work force during operation of the pipeline would vary depending on activity but would typically be one to four personnel, four to five times per year along the length of the pipeline. No new additional permanent employment positions are anticipated to be created for Project operations.

B8.1 Maintenance and Repair Activities

No new or expanded access would be needed for SWG to operate and maintain the new pipeline after it has been installed. SWG would continue to maintain the pipeline confined within BLM grant. No subsequent hydrostatic testing is anticipated for the proposed pipeline. There would not be any removal or addition of any pumps or pipe as part of standard maintenance unless third-party damage or other unforeseeable problems create a need to make repairs to the pipeline.

SWG's operation and maintenance activities include routine visits to perform activities such as safety inspections and monitoring, pigging and integrity management activities, cathodic protection maintenance and repair, and replacement and maintenance of components such as regulators and valves.

Operation and maintenance activities would also conform to all relevant safety regulations as well as SWG's Safety and Emergency Plan manual. No industrial wastes or toxic substances of any kind would be stored, transported, or generated along the ROW upon completion of the pipeline construction and rehabilitation activities.

The anticipated maintenance and repair activities have been grouped into categories and are summarized below:

Routine Maintenance: Routine maintenance includes normal maintenance activities that occur year-round and do not result in surface disturbance. There are numerous types of routine maintenance activities that occur on a daily or regular basis on different portions of the pipeline. These include visual inspections and monitoring, cathodic protection/close interval surveys, determination of depth of cover, meter station calibration/maintenance and adjustments, exercising of valves and replacement of small system elements. These activities would use existing access roads and the existing maintenance road within the existing

ROW, and would not produce significant disturbance to species or habitats beyond the presence of personnel and vehicles in established pipeline and facility areas.

Major Maintenance: Major maintenance activities include activities that result in surface disturbance including previously disturbed areas. These activities include the repair or replacement of major facility elements (e.g., equipment, cathodic protection systems, valves, pipes, etc.) and use of equipment that could result in impacts to habitat. Depending on the type and scale of the proposed activity, these activities may affect anywhere from less than an acre to much larger areas. Examples of major maintenance activities include the following:

Right-of-Way Maintenance: Typically, these activities include repair of erosion, scour, land movement, and slumping on the ROW including maintenance to the existing access road that parallels the pipeline. Repair of erosion and scour could include installation of temporary or permanent culverts at drainage crossings. Access road maintenance may also include adding a roadbase material such as type 2 material to the road. Road material would be obtained from an existing material site. Equipment necessary to complete ROW repairs generally includes a backhoe/excavator, cat-loader flat-bed trailer truck, and small four-wheel drive or pickup trucks. Any given ROW repair, involving two or more employees and/or contractors, could require 10 days or more per year to complete.

Below-Grade Pipe and Coating Inspections/Repairs: Following a routine in-line inspection and/or cathodic protection survey, portions of the pipe may need to be excavated for visual inspection. The pipe and pipe coating would be examined at this time. Should the failed pipeline coating be revealed, further excavation and recoating of the pipeline segment would be necessary. This activity typically would involve pickup trucks, a flatbed truck/trailer or dump truck with trailer, a backhoe, a trailer-mounted compressor, a portable sand-blaster, barricades, and plastic fencing. Any given pipe inspection could require two or more employees and/or contractors and could last for approximately two to five or more days. The area disturbed and the time required to complete this activity would depend upon the length of pipeline needing inspection. A typical inspection of this type would involve exposing the pipe, usually a hole six to 10 foot deep and 20 to 30 feet in length depending on depth of pipe, slope and terrain. The holes would be refilled with the excavated material and re-seeded immediately following the repair.

Maintenance/Replacement of Ground Anode Beds or Cathodic Protection Rectifiers: The ground anode beds and rectifiers installed during initial construction of the pipeline would need to be replaced approximately every 10 to 15 years. This activity is limited to previously disturbed areas and is typically inside or immediately adjacent to fenced facilities, such as meter stations. In addition to pickup trucks with equipment specific to the task, this activity would involve a flatbed truck/trailer or dump truck with trailer, drilling rig, and a backhoe/excavator. Any given replacement of ground bed anodes or rectifiers could require two or more employees and/or contractors and could last for approximately two to five or more days.

Installation of Anode Flex: Based on the results of pipeline surveys and expected adjacent powerline loads, an engineering analysis may determine the need for installation of anode flex adjacent to the pipeline. The installation of anode flex is intended to alleviate induced current on the pipeline. Anode flex is a cathodic protection device that is installed by plowing/trenching and is placed parallel to and approximately 10 feet away from the pipeline. It is connected to the pipeline by lead wires at approximately 1,000 foot intervals. Anode flex can be installed parallel to the pipeline from several thousand feet to several miles. The surface disturbance is very minimal. It is typically buried a minimum of 4 feet deep using a tractor dozer with a 3-inch narrow plow blade. No material is typically excavated or stored during this process. This work takes place immediately adjacent to the existing pipe and within the disturbed ROW. Equipment required to install the anode flex includes a tractor dozer and several utility trucks. The number of employees and/or contractors and the construction schedule would vary depending upon the length of the area.

Pipeline Segment Replacement: Should a pipeline segment require replacement (e.g., severe corrosion or other damage) excavation and replacement of a portion of the pipeline would be necessary. In addition to pickup trucks, this activity typically would involve a flatbed truck/trailer or dump truck with trailer, a backhoe, a trailer-mounted compressor, a truck mounted crane, a side boom, barricades, and plastic fencing. Replacement of pipeline usually requires multiple employees and/or contractors. The area disturbed and the time required to complete this activity would depend upon the length of pipeline needing replacement.

Emergency Repairs: To ensure public safety and service reliability and to protect the environment, emergency repairs may be necessary for pipeline leaks or breaks, exposure of the pipeline due to erosion, and severe damage caused by a severe storm, natural disaster or catastrophic event. These activities would usually involve a backhoe and/or cat-loader, motor grader, and possibly other heavy earth-moving equipment. Any given emergency repair could require two or more employees and/or contractors and could last for approximately 3 or more days. Pipeline leaks or breaks would involve equipment similar to those identified under the below-grade pipe and coating inspections or pipeline segment replacement headings.

Emergency Leak Excavations: Following a leakage survey indicating escaping gas, a portion of the pipe would be excavated for visual inspection. In addition to pickup trucks, this activity would typically involve a flatbed truck/trailer or dump truck with trailer, a backhoe, a trailer-mounted compressor, barricades, and plastic fencing. Should workers find a leak, additional trucks with welding machines would be required. SWG anticipates that any given emergency leak excavation could require two or more employees and/or contractors and could last for approximately 2 to 5 or more days.

B8.2 Inspection and Maintenance Schedules

The proposed pipeline would be added to SWG's existing pipeline inspection program. Continuous surveillance of SWG's pipeline system is conducted according to USDOT requirements to determine the appropriate action concerning possible changes in class location, failures, USDOT notification, leakage history, corrosion, substantial changes in cathodic protection requirements, and other unusual operating conditions. Operation and maintenance of the pipelines with vehicles and personnel would include periodic ROW patrols and corrosion/leak detection surveys to detect conditions that may adversely affect the integrity of the pipeline. All valves and corrosion control test stations would also be inspected regularly.

The pipeline ROW, pipeline leak surveys, and cathodic protection maintenance would be inspected following USDOT and SWG's internal requirements. Pipeline markers and signs would be inspected and maintained or replaced, as necessary, to ensure that the pipeline location is visible from the ground. All inspection and maintenance work would be conducted from the ground.

B8.3 Work Schedules

SWG maintenance intervals would be determined by the USDOT regulations at Title 49 CFR Part 192 and SWG Operations Manual. Typical work hours would be during regular business hours (7:00 a.m. to 5:00 p.m.) Monday through Friday; however, during summer months work might be conducted outside these typical work hours to avoid extreme temperature conditions.

B8.4 Fire Control

The pipeline crossing land managed by the BLM, Las Vegas Field Office (LVFO) would be located within areas of previous disturbance and collocated along existing pipeline corridor and roads, where feasible.

During initial construction, SWG would grade the ROW. Thus, the ROW should be clear of vegetation during the construction to reduce the availability of fuels and fire risk. Additionally, SWG would regularly use water as dust control in areas where construction is underway. During construction, operation, and maintenance each construction crew would have at least one fire extinguisher available at

all times. As discussed in **Section C1.8**, additional fire controls would be used in association with welding activities. SWG would follow all required state and local guidance for fire prevention.

B9 Termination and Restoration

SWG does not intend to terminate the Project once in operation; however, if the Project is terminated and the ROW needs to be restored, the following would be implemented as part of final restoration and reclamation.

B9.1 Structure Removal

No new above-ground facilities are anticipated to be constructed as part of this Project. However, existing above-ground facilities that will be included in the consolidated BLM authorization would be removed of and disposed of. This includes the Intersection Point Pressure Limiting Station (PLS), Horizon PLS, Red Rock Crossover Blowdown Assembly, Searchlight Crossover 1 Blowdown Assembly, Searchlight Crossover 2 Blowdown Assembly, Powerline Blowdown Assembly, Dry Lake Blowdown Assembly, Reducer Station Blowdown Assembly, Milepost 2.86 Blowdown Assembly North, Milepost 2.86 Blowdown Assembly South, Eldorado Substation Crossover, Davis Dam Crossover, and Davis Dam Compressor Station.

B9.2 Pipe Removal

The pipeline would be disconnected from the source of gas supply and the pipeline would be purged of natural gas, as necessary. In order to minimize additional ground disturbance the pipeline would not be removed, but rather the pipeline would be abandoned in-place. As a part of abandonment in place, the pipe would be cut and capped with a steel plate. Cutting and capping will occur approximately every one mile and will require an approximate 8-foot by 8-foot bell hole within a 40-foot by 60-foot workspace at each cut and cap location. The 40-foot by 60-foot disturbance area will include space for equipment to access the existing pipeline and to dig an approximately 8-foot by 8-foot bell hole to allow the construction crew to access the existing pipeline to cut and cap.

B9.3 Stabilization and Re-vegetation

Following structure removal and abandonment of the pipeline, the ROW would be restored. This may include roughening of the pipeline operation and maintenance access road. The operation and maintenance access road would then be revegetated and restored in accordance with the BLM requirements in effect at the time.

APPENDIX C

DESIGN FEATURES AND APPLICANT PROPOSED MITIGATION

C. Design Features and Applicant Proposed Mitigation

C1 Geologic Hazards, Minerals

Southwest Gas Corporation (SWG) has developed a Naturally Occurring Asbestos (NOA) Mitigation Plan for the Project (Arcadis 2019a) to maintain safe working conditions during construction and prevent the migration of asbestos-containing materials from the site. Best management practices (BMPs) would be used to limit dust, and thus further decrease the potential inhalation exposure to NOA.

C2 Air Resources

The BMPs would be used to limit dust and help mitigate fugitive dust emissions and inhalation. Low speed limits would be enforced on the ROW to limit the amount of airborne dust re-entrained by vehicles. Dust suppression would be controlled by deploying water from water trucks. Paved roads adjacent to the ROW, if present, would be swept or scraped as required to minimize dust deposits on the road, especially at Project entrances. Through the permitting processes, specific air requirements would be identified, and plans for mitigating air impacts would be prepared as necessary.

C3 Water Resources

The drainages are anticipated to be dry during pipeline crossing. If there is no flow in the drainages at the time of crossing, SWG would follow standard upland construction techniques. Should there be perceptible flow within the drainages at the time of the planned construction, SWG would use BMPs as approved by the Bureau of Land Management (BLM) and local agencies. To minimize impacts, such as introducing sediment into the drainages crossed by the proposed Project, SWG would implement measures including sediment and erosion control devices such as silt fence, straw bales, and slope breakers. In addition, SWG would adhere to the Project Spill Prevention and Response Procedures, which would be developed for the Project, to avoid or minimize impacts from leaks and spills of hazardous materials.

After construction is completed, all drainages would be restored to pre-construction conditions to the extent feasible, and all excess materials would be removed. In drainages, the pipeline would be buried at a minimum depth of 4 feet below scour depth at waterbody crossings to avoid pipeline exposure.

C4 Soils

To minimize or avoid potential impacts due to soil and water erosion, SWG would identify erosion and sedimentation control measures in the Project Restoration and Revegetation Plan and the Stormwater Pollution Prevention Plan (SWPPP) that would be developed for this Project. Erosion control measures that would be implemented may include temporary and permanent slope breakers, sediment barriers (such as silt fencing and straw bales), erosion control fabric, mulch, and timely revegetation practices. In addition, all graded areas would be restored to as near the natural or pre-existing grade as practicable. However, steep cuts may be restored to a stable position and protected by appropriate erosion control measures in areas of erosive soils or

slopes with potential for mass wasting (i.e., slumping or landslides). These locations may not be known until on-site inspections are conducted during construction.

Most soils within the Project area have low to moderate resistance to compaction by vehicle and heavy equipment travel (**Table 9; Appendix A**). SWG would implement the mitigation measures for soil compaction identified in the Restoration and Revegetation Plan that would be developed for this Project. If subsequent construction and cleanup result in further soil compaction, the soil would be tilled.

Once recontouring is complete, subsoil compaction of work areas would be relieved by ripping, discing, or chisel plowing, unless otherwise directed by the landowner or appropriate government agency. Excess rock on the surface would be removed and disposed of at an approved location or as directed by the landowner or appropriate government agency. Discing or other means of tilling should parallel the contours of slopes. The ROW would be left in a roughened condition to minimize the erosive effects of water and wind and to provide a seed bed for revegetation.

Stabilization measures would be initiated as soon as practicable. Final grading and permanent erosion control structures would be completed after backfilling the trench. Permanent slope breakers or terraces would be constructed across the ROW on sloping ground to divert surface water away from the backfilled trench and into stable, well vegetated areas following spacing guidelines in the Project SWPPP. On steep grades, earth-filled sacks or stone riprap may be necessary to stabilize the ground surface. Erosion control matting would be used as appropriate on all drainages to ensure bank stability. These measures would prevent channeling along the trench line on hillsides or sloping ground. Temporary sediment barriers would be removed when replaced by permanent erosion control measures or when revegetation is successful.

Revegetation measures would also be implemented to control erosion and sediment by establishing a permanent vegetative cover over disturbed areas. A vegetative cover composed of compatible native species, similar in composition to pre-construction conditions, would be re-established.

Soil contamination control measures would be used when refueling on site equipment. Spill kits would be kept on site during construction to minimize impacts of an accidental spill or release of fuels.

C5 Vegetation

Grading would be required along the trench line in all upland areas and in areas of irregular topography to create a level workspace, to provide adequate access and safe working conditions for workers, and for equipment and vehicle operation. Clearing and grading activities will consist of Overland Drive and Crush, Clear and Cut, and Clear and Cut with Soil Removal. Within the permanent pipeline ROW an 8-foot-wide corridor directly over the proposed pipeline would be cleared utilizing Clear and Cut with Soil Removal to allow for trench excavation and pipeline installation. The remaining portions of the permanent pipeline ROW and TUP/temporary easement staging areas are anticipated to utilize Overland Drive and Crush. TUP/temporary easement pipeline workspace and three TUP/temporary easement access roads where additional improvements are would utilize Clear and Cut to allow for safe operation of equipment and materials storage. The spoils (subsoil) from grading operations along the 8-foot-wide pipeline trench would be stockpiled adjacent to the trench.

Prior to construction of each Phase SWG will submit a TUP application to the BLM. At that time a detailed review of the proposed Project design will determine if there are ways to reduce the proposed areas for Clear and Grade and Clear and Cut with Soil Removal. Wherever possible grading will be limited and areas cleared of vegetation or disturbed during construction would be minimized to the smallest possible footprint. Where possible, protective orange fencing would be installed around mature trees within the construction corridor to protect the trees. Cacti and yucca would be salvaged in accordance with BLM guidelines. As feasible, SWG would allow for vegetation to be preserved along the banks of drainages where the pipeline crosses. The construction contractor would determine in the field what vegetation would be removed based on safety and construction considerations.

All vegetative material (trees, shrubs, and other plants) would be removed from the Project during clearing of the construction ROW and properly disposed in accordance with BLM guidelines, at approved facilities, or used for erosion control. Vegetative debris may be chipped or disposed of according to applicable regulations and landowner/land-manager agreement. Materials taken off site would be disposed of at commercial facilities or at other locations approved by the appropriate regulating agencies. Stumps, large rocks, and other vegetation debris that would interfere with restoration, such as seedbed preparation, would be removed from the ROW and disposed of appropriately. Vegetation and other debris would not be mixed with backfill.

SWG developed a Project Restoration and Revegetation Plan, under which all reseeding would be completed as soon as practical following construction or in accordance with landowner or agency guidelines. Seed mixes would be developed in consultation with the Natural Resource Conservation Service (NRCS), the BLM, Clark County, and other landowners as applicable. Native, local species would be used to the extent that they are commercially available. This plan would also describe guidelines for cacti and yucca salvage in accordance with BLM guidelines (BLM 2011) including proper methods for removal and relocation.

Seeding would be accomplished by broadcasting, use of a rangeland drill, or use of a hydroseeder depending on the topography and slope of the terrain.

If the seedbed in areas to be revegetated has crusted over or otherwise become sealed, the seedbed would be prepared by discing or other mechanical means sufficient to allow penetration of seed into the soil. Seedbed would be prepared manually using harrows or discs pulled behind a tractor or small bulldozer wherever seeding takes place to relieve compaction, break up large blocks of soil, and prepare the soil surface for planting. Seedbeds would be prepared along the contour on sloped portions of the ROW.

Mulching may be used on slopes and other areas concurrent with or immediately after seeding where necessary to stabilize the soil surface and to reduce wind and water erosion. Materials to be used for mulch include weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.

SWG developed a Noxious and Invasive Weed Control Plan (Weed Control Plan) in accordance with BLM guidance (i.e., using the BLM Weed Management Plan template). The purpose of the Weed Control Plan is to establish standards and practices to minimize the expansion of populations of noxious and invasive weeds, including exotic (non-native) species, during the construction and maintenance of the Project. SWG's objective will be to assist federal, state, and local agencies' weed control efforts; to comply with requirements designed to prevent the spread

of noxious and invasive weeds; and to implement weed control measures on areas of the Project that are identified to be of special concern. Preventative and control measures would include equipment inspections and cleaning as required to prevent introduction and spread of noxious and invasive weed species. Weed removal could include hand-removal, mechanical controls, and potentially herbicide treatment. SWG would be required to have a Pesticide Use Proposal (PUP) prior to issuance of the ROW. Herbicide use is therefore a part of the Proposed Action. Herbicides used would be those approved for use as part of the current Programmatic Biological Opinion (PBO, USFWS 2019) that covers the Proposed Action. Herbicide use would occur during biologically appropriate times to control weed species, as described in the Weed Control Plan Herbicide would be applied by backpack sprayer or hand sprayer – vehicle-mounted sprayers would not be allowed.

In addition, all reclamation equipment would be cleaned before use in the Project area to eliminate the potential for spread of noxious weeds or other undesirable non-native species. Per BLM requirements, any non-native fill or hay/straw used on the Project would be certified weed-free. All leftover seed from previous restoration projects would be removed from seeding equipment before use on the Project.

C6 Terrestrial Wildlife

Following completion of construction, areas of disturbed vegetation would be reseeded with native shrubs, grasses, and forbs to restore affected wildlife habitat unless otherwise directed by landowners.

Land clearing or surface-disturbing activities, potentially including mowing, is planned to occur during the winter months outside of the migratory bird breeding season as much as possible (March 1 to August 1).

C7 Threatened, Endangered, or Sensitive Species

SWG would follow the mitigation measures identified in the BLM Programmatic Biological Opinion (PBO) (U.S. Fish and Wildlife Service [USFWS] 2019).

SWG would develop a Desert Tortoise Monitoring, Mitigation, and Impact Minimization Plan before construction and in consultation with the USFWS and the BLM to further minimize the expected impacts to desert tortoise from the Project. This plan would include pre-construction, construction, and post-construction measures designed to limit direct impacts to desert tortoise during Project construction and operation.

C8 Visual Resources

To minimize potential visual impacts, SWG has proposed a pipeline route within its existing ROW, directly adjacent to existing pipelines. To minimize long-term visual impacts, the proposed pipeline would be buried, and aboveground facilities are not proposed. Additionally, lighting of the ROW is not proposed. Areas where vegetation has been cleared would be revegetated with a native seed mix developed in consultation with the NRCS, the BLM, Clark County, and other landowners as applicable.

C9 Land Use

Upon completion of construction, ground disturbances would be restored and revegetated. Soil and vegetation restoration measures are described above.

In addition to standard stipulations, because of the importance of the Piute Eldorado ACEC to the recovery of the threatened Mojave Desert tortoise, the Noxious and Invasive Weed Management Plan developed by SWG will actively address preventing the spread of Sahara mustard, other noxious weeds, and prevent the increase of any non-native species. Surveys and control of weeds will occur throughout the lifetime of the Project.

C10 Cultural Resources

SWG would avoid known eligible or potentially eligible cultural resources within the Project area and developed a Project Cultural Resource Unanticipated Discovery Plan (UDP) if it is determined that one may be needed. While impacts to cultural or historical resources are not expected, should cultural or historical resources be discovered during construction, SWG would notify the BLM. The BLM or a BLM-designated cultural resource specialist would evaluate the discovery and identify what course of action should be taken.

APPENDIX D

STANDARD STIPULATIONS

D. Standard Stipulations

The following standard stipulations must be implemented unless the stipulation is not applicable to your proposed action. Those standard stipulations that include "if applicable, if used, or if constructed" are to be implemented if the proposed action includes that activity or design.

D1 General Resource Stipulations

D1.1 The Holder shall comply with all applicable local, state, and federal laws and regulations for the protection of resources and the environment, to include but not limited to air, cultural, hazmat, soil, vegetation, water, wildlife.

D1.2 As part of project reclamation, the Holder will be responsible for ensuring that any boreholes, wells, or other openings in the ground are backfilled and properly covered, according to the Nevada Regulatory Statues.

D1.3 The Holder shall remove from public land and properly dispose of any and all trash, litter, debris, waste, excess materials, including flagging and signs, or other substances and materials resulting from the use under this authorization. All trash and food items shall be promptly contained within closed, raven-proof containers.

D2 Threatened, Endangered or Candidate Animal Species

D2.1 Compliance with the special stipulations below will help to ensure desert tortoises are not impacted:

D2.1.1 A speed limit of 25 miles per hour shall be required for all vehicles travelling on existing roads.

D2.1.2 Should a desert tortoise enter the area of activity, all activity shall cease until such time the animal leaves the area of its own accord.

D2.2 All drivers must check underneath vehicles and equipment before moving to ensure no tortoise has taken cover underneath parked vehicles.

D2.3 The Holder will comply with the terms and conditions of the Biological Opinion File No. 84320-2010-F-0365.R038 for this project. The Biological Opinion is on file at the Bureau of Land Management, Southern Nevada District Office. The terms and conditions are attached.

D2.4 The Holder, upon completion of the proposed action, must submit Appendix G found in the terms and conditions of the Biological Opinion (attached). Please forward Appendix G to the BLM, Attn: Wildlife Biologist, 4701 N. Torrey Pines Drive, Las Vegas, Nevada, 89130. Failure to abide by the terms and conditions of the grant and Biological Opinion, could result in temporary suspension of all activities within your ROW area per 43 CFR 2886.16 and 43 CFR 2886.17.

D2.5 Additionally, the designated biologist on site at the time of construction will need to be able to recognize rosy two-toned beardtongue, or general beardtongue species (when not flowering), and will notify the BLM botanist if plants are located on site before or during construction.

D3 Cultural and Paleontological Resources

D3.1 Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the Holder, or any person working on his behalf on public or federal lands shall be immediately reported to the Authorized Officer. Holder shall immediately suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. The Holder will make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. In some cases, this may delay activity at the site until the discovery may be recovered, or the project is modified to avoid impacting the find.

D3.2 An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or paleontological values. Any decision regarding suitable mitigation measures will be made by the Authorized Officer after consulting with the Holder. The Holder will be responsible for the cost of evaluation. Holder shall be responsible for the resultant mitigation costs.

D4 Native American Concerns

D4.1 Prior to construction, the Holder shall coordinate with Colorado River Indian Tribes (CRIT) on their request to have a tribal monitor present for the Project.

D5 Hazardous Materials

D5.1 If hazardous materials/substances are used or present within the authorized area, the Holder shall immediately notify the Authorized Officer of any release (leaks, spills, etc.) of hazardous substances, toxic substances, or hazardous waste. As required by law, Holder shall have responsibility for and shall take all action(s) necessary to respond to and fully remediate releases (leaks, spills, etc.) within the authorized area. A copy of any report required or requested by any federal, state, or local government agency as a result of a reportable release or spill of any hazardous substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved federal, state, or local government agency.

D6 Survey Monuments

D6.1 Holder shall protect all survey monuments found within the authorization area. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coast and Geodetic Survey benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. If any of the above are to be disturbed during operations, the Holder shall secure the services of a Professional Land Surveyor or Bureau cadastral surveyor to perpetuate the disturbed monuments and references using surveying procedures found in the Manual of Instructions for the Survey of the Public Lands of the United States and Nevada Revised Statutes, Chapter 329, Perpetuation of Corners. The Holder shall record such survey in the appropriate county and send a copy to the Authorized Officer. If the Bureau cadastral surveyors or other federal surveyors are used to restore the disturbed survey monuments, the Holder shall be responsible for the survey cost.

D7 Fire and Fuels

D7.1 Compliance with fire restrictions is mandatory while fire restrictions are in effect. Specific non-compliant activities may be permitted in writing on a case by case basis by a line officer after review and approval by the Fire Management Officer (43 CFR 9212). Fire restrictions are generally enacted May through October. Fire restriction orders are available for review at BLM district offices and on the BLM website.

D7.2 The use of standard fire prevention measures should be practiced at all times (43 CFR 2885.11). Conditions that support wildfires can occur any time of the year in Southern Nevada.

D7.3 The Holder shall immediately report fires to 911 or (702) 631-2350 and make all accommodations to allow immediate safe entry of firefighting apparatus and personnel.

D7.4 An Origin and Cause Investigation will be carried out on any human caused fire by BLM law enforcement or their designated representative. To minimize disturbance of potential evidence located at the fire scene, the applicant/proponent shall properly handle and preserve evidence in coordination with the BLM. The BLM shall pursue cost recovery for all costs and damages incurred from human-caused fires on BLM lands when the responsible party(s) has been identified and evidence of legal liability or intent exists. Legal liability includes, but is not limited to, negligence and strict liability (including statutory and contractual liability), products liability, etc.

D7.5 Protect assets or infrastructure from wildfire where needed by maintaining a wildfire defensible or survivable space. Consider using less combustible materials or plant materials where applicable. Consider implementing *Living with Fire* or *Firewise* strategies.

D8 Invasive Species and Noxious Weeds

D8.1 The Holder will keep their project area free of state-listed noxious weeds, such as Sahara mustard (*Brassica tournefortii),* for the life of the project. The Holder shall perform annual monitoring for invasive species/noxious weeds. Any detections of noxious weeds should be reported to the SNDO Weed Management Specialist immediately (702-515-5000) to determine best course for treatment.

D8.2 The use of pesticide treatment requires the Holder to coordinate with the BLM SNDO weed management specialist (702-515-5000) and prepare, submit, obtain, and maintain a Pesticide Use Proposal (PUP) to utilize pesticides for project activities.

D8.3 In order to reduce the accidental spread of noxious weeds, the Holder and any contractors shall avoid or minimize all types of travel through a state listed noxious weed-infested areas that can be carried to the project area. In order to minimize the threat of spreading noxious weeds project-related equipment (i.e. undercarriages and wheel wells) should be cleaned of all mud, dirt, and plant parts before moving into relatively weed-free areas or out of relatively weed-infested areas. Project workers shall inspect, remove, and dispose of weed seed and plant parts found on their clothing and personal equipment, bag the product, and dispose of it in a dumpster. If you have questions, consult with the BLM SNDO noxious weed coordinator.

D8.4 During construction and maintenance activities the Holder shall:

D8.4.1 Review the annual weed inventory prior to any ground disturbance;

D8.4.2 Limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed.

D8.4.3 Begin activities in weed free areas whenever feasible before operating in weed-infested areas.

D8.4.4 Locate equipment storage, machine and vehicle parking or any other area needed for the temporary placement of people, machinery and supplies in areas that are relatively weed-free;

D8.4.5 Avoid or minimize all types of travel through weed-infested areas or restrict major activities to periods of time when the spread of seed or plant parts are least likely.

D8.5 If landscaping is part of the project design, the Holder will ensure that landscaping does not contain state-listed noxious weeds, such as fountain grass (Pennisetum setaceum).

D9 Mineral Resources

D9.1 If construction activities produce excess mineral materials from within the boundaries of the Proposed Action, the mineral materials must be used within the boundaries of the Proposed Action or stockpiled within the boundaries of the Proposed Action for future disposal by the BLM.

D9.2 If construction activities require that excess mineral materials be exported from within the boundaries of the Proposed Action as they are generated, then written authorization, a mineral material sales contract, a free-use permit, etc. must be obtained from the BLM by the Holder prior to exporting the excess mineral materials from within the boundaries of the Proposed Action.

D9.3 If mineral materials are to be stockpiled on site for a future disposal, specific BLM use authorization in the form of a written authorization, mineral material sales contract, free-use permit, etc. must be obtained from the BLM prior to exporting the excess mineral materials from within the boundaries of the Proposed Action.

D10 Migratory Birds

D10.1 Projects that require ground disturbance or actions that could affect nesting birds, should try to be scheduled outside of the bird breeding season. Breeding season in the SNDO generally occurs from February 15 to August 31. If a project cannot be schedule outside of those dates, a qualified biologist may be required to conduct a survey for nesting birds. If nesting birds are found, methods to reduce project impacts to nesting birds will be developed in coordination with the BLM.

D10.2 Any infrastructure for projects will be designed and constructed in a manner that does not allow open pipes that birds or other wildlife could be trapped in. This includes fencing, gates, or other materials with open holes. All open pipes will be capped or secured so that wildlife cannot access.

D10.3 If lighting is installed on buildings or required by the FAA, lighting on buildings should be down-shielded and those structures/towers required by FAA to have lighting

installed, should have flashing lights with the minimum intensity required by the FAA to prevent migratory bird collisions.

D10.4 If project involves power lines and/or power line posts, the Holder shall follow Avian Power Line Interaction Committee (APLIC) guidelines (Suggested Practices for Avian Protection on Power Lines (2006) and Reducing Avian Collisions with Power Lines (2012)) to reduce this risk through facility design and comply with MBTA and other federal wildlife laws, due to potential for electrocution, collision, and nesting/perching by migratory birds on overhead power lines.

D10.5 If guy wires are used on structures (including power line posts and communication towers) they must be marked with bird diverters so they are visible to prevent injury/mortality to birds through collision.

D11 Fish and Wildlife, Excluding Federally Listed Species

D11.1 If artificial water sources are used, ensure that they have a properly installed and designed escape ramp to allow for wildlife to flee in the event of accidental entrapping.

D11.2 Project supplies or equipment where wildlife could temporarily hide will be inspected prior to moving them to reduce the potential for injury to wildlife. Supplies and equipment that cannot be inspected, or from which wildlife cannot escape or be removed, will be covered or otherwise made secure from wildlife intrusion or entrapment at the end of each work day.

D11.3 If any Gila monsters are encountered during project construction they must be reported immediately to the Nevada Division of Wildlife at (702) 486-5127.

D12 Wild Horse and Burro

D12.1 If wild horses and/or burros are encountered in or near the authorized area do not feed, harass, or otherwise interact with the animal. Report sick or injured animals, or violations to animals to the BLM immediately.

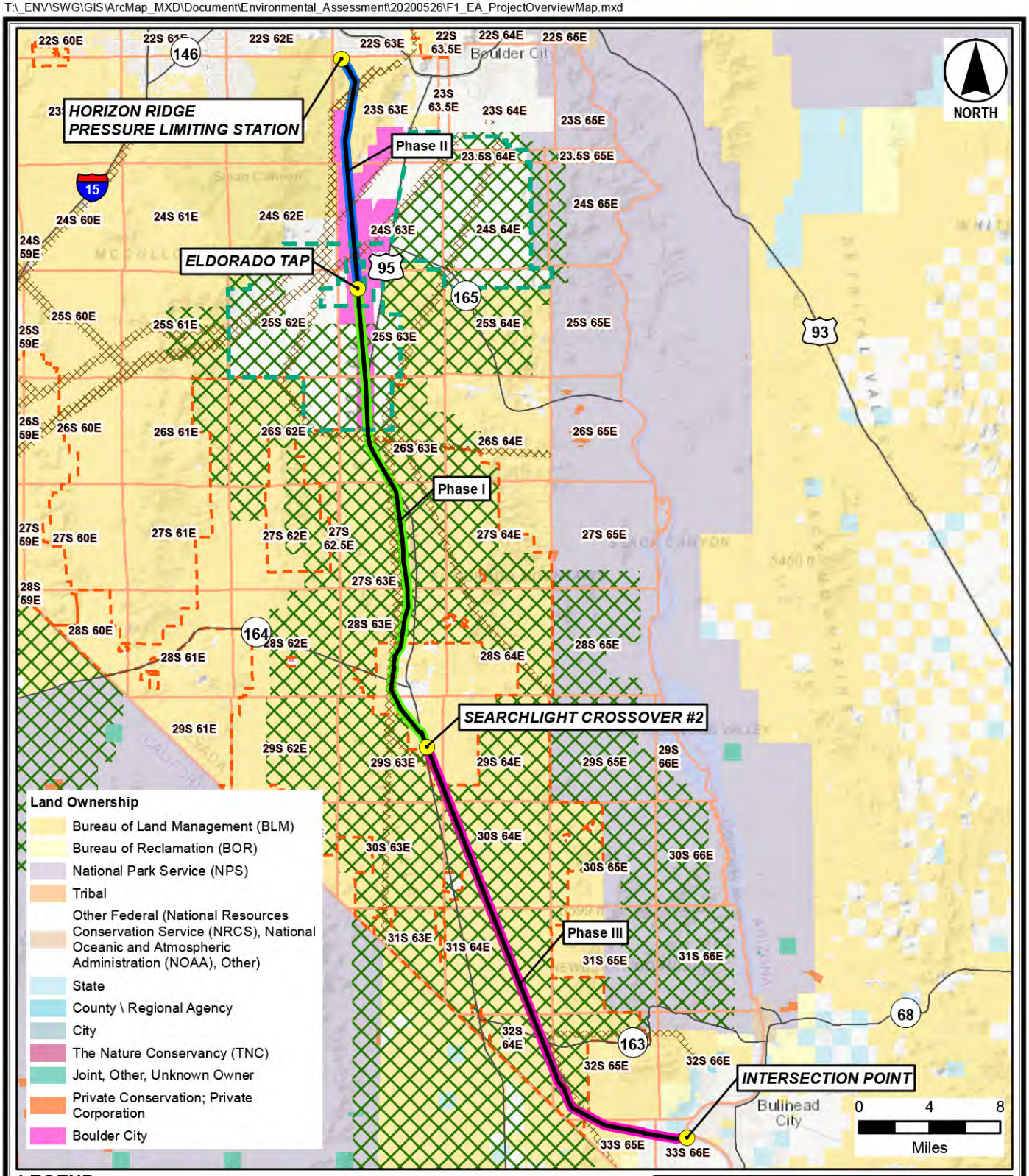
D13 Recreation

D13.1 Unless expressly stated, a land use authorization does not create an exclusive right of use of an area by the holder. The holder shall not interfere with other valid uses of the federal land by other users, such as casual recreationists.

APPENDIX E

FIGURES

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F1_EA_ProjectOverviewMap.mxd



LEGEND

- Proposed
- BLM Managed Utility Corridor

Project Construction Phases

- Phase I
- Phase II
- Phase III
- Phase I, II, and III Tie-in Locations
- Areas of Critical Environmental Concern (ACEC)
- Boulder City Conservation Easement
- Nevada Township Boundary
- Desert Tortoise Critical Habitat

Note:
PLS: Pressure Limiting Station

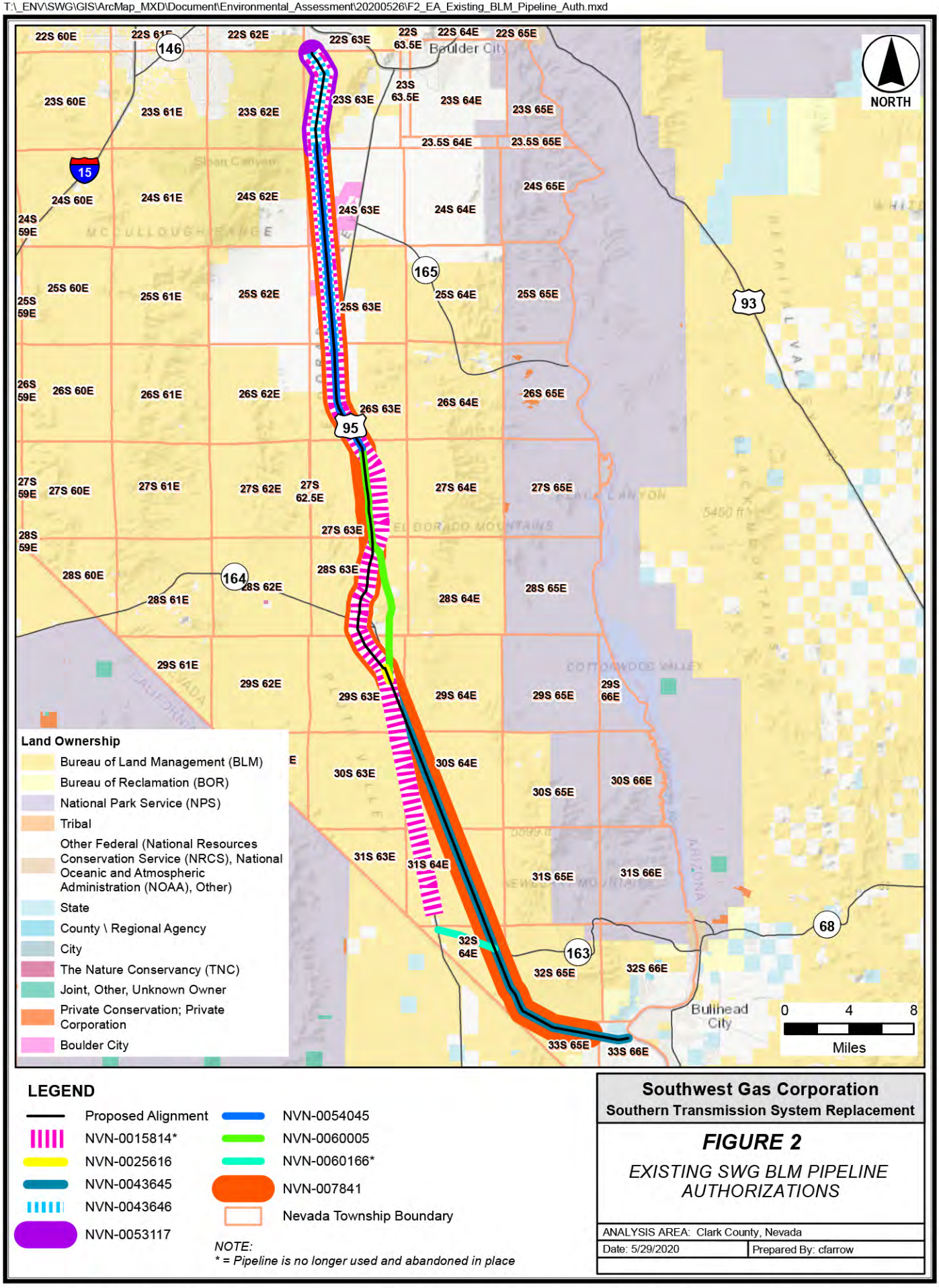
Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 1

PROJECT OVERVIEW MAP

ANALYSIS AREA: Clark County, Nevada
Date: 1/15/2021 | Prepared By: MNesta

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F2_EA_Existing_BLM_Pipeline_Auth.mxd



LEGEND

- Proposed Alignment
- NVN-0015814*
- NVN-0025616
- NVN-0043645
- NVN-0043646
- NVN-0053117
- NVN-0054045
- NVN-0060005
- NVN-0060166*
- NVN-007841
- Nevada Township Boundary

NOTE:
** = Pipeline is no longer used and abandoned in place*

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 2

EXISTING SWG BLM PIPELINE AUTHORIZATIONS

ANALYSIS AREA: Clark County, Nevada
Date: 5/29/2020 | Prepared By: cfarrow

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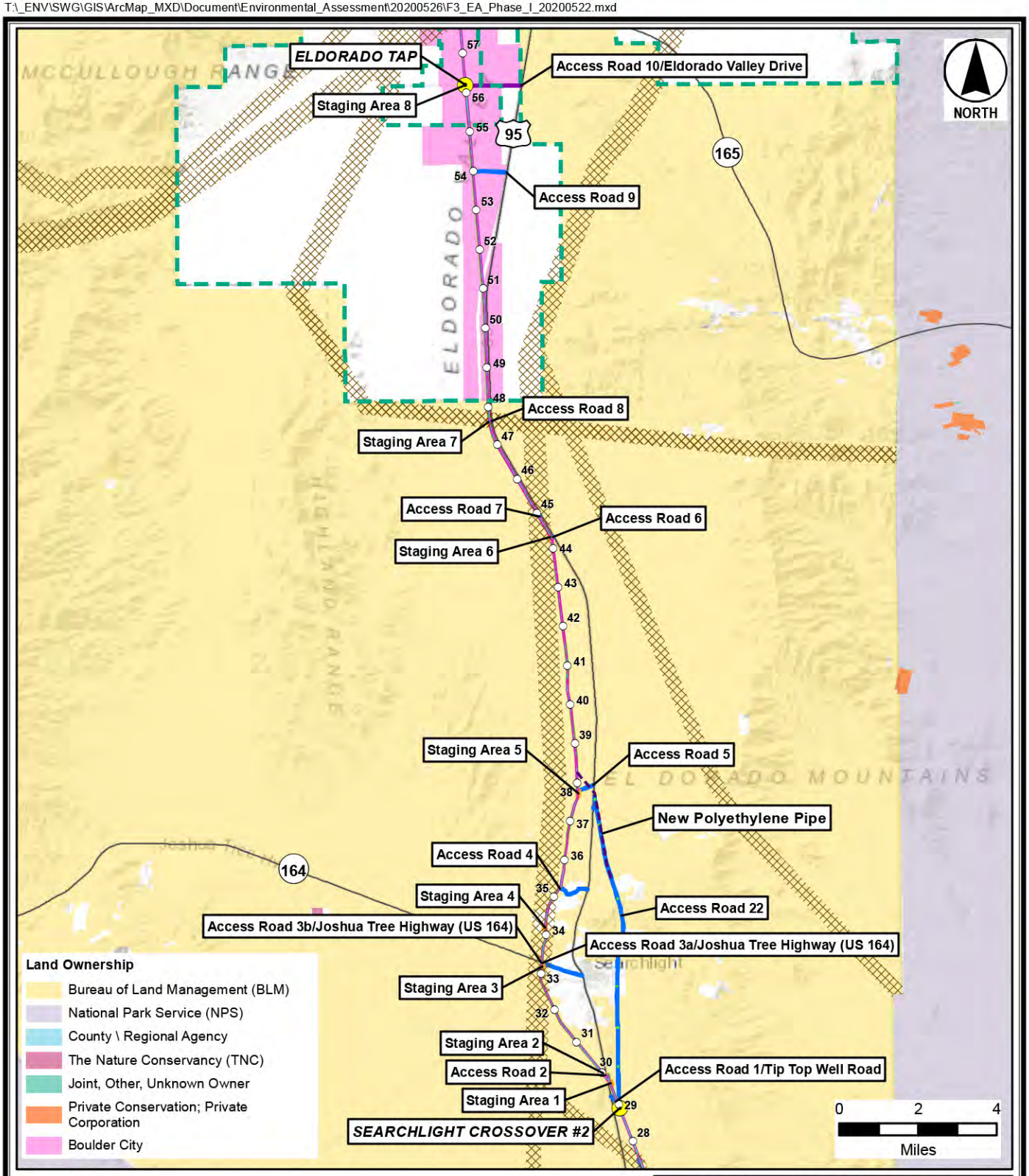

LEGEND

- BLM Managed Utility Corridor
- Boulder City Conservation Easement
- Phase I, II, and III Tie-in Locations
- Mile Posts
- New Polyethylene Pipe
- Previously Disturbed Area

Disturbance Areas

- Access Road Used for Construction and Operations
- Access Road Used for Construction
- Staging Area
- Permanent Right-of-Way
- Temporary Right-of-Way

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 3

PHASE I:
SEARCHLIGHT CROSSOVER TO ELDORADO TAP

ANALYSIS AREA: Clark County, Nevada

Date: 1/14/2021 | Prepared By: MNesta

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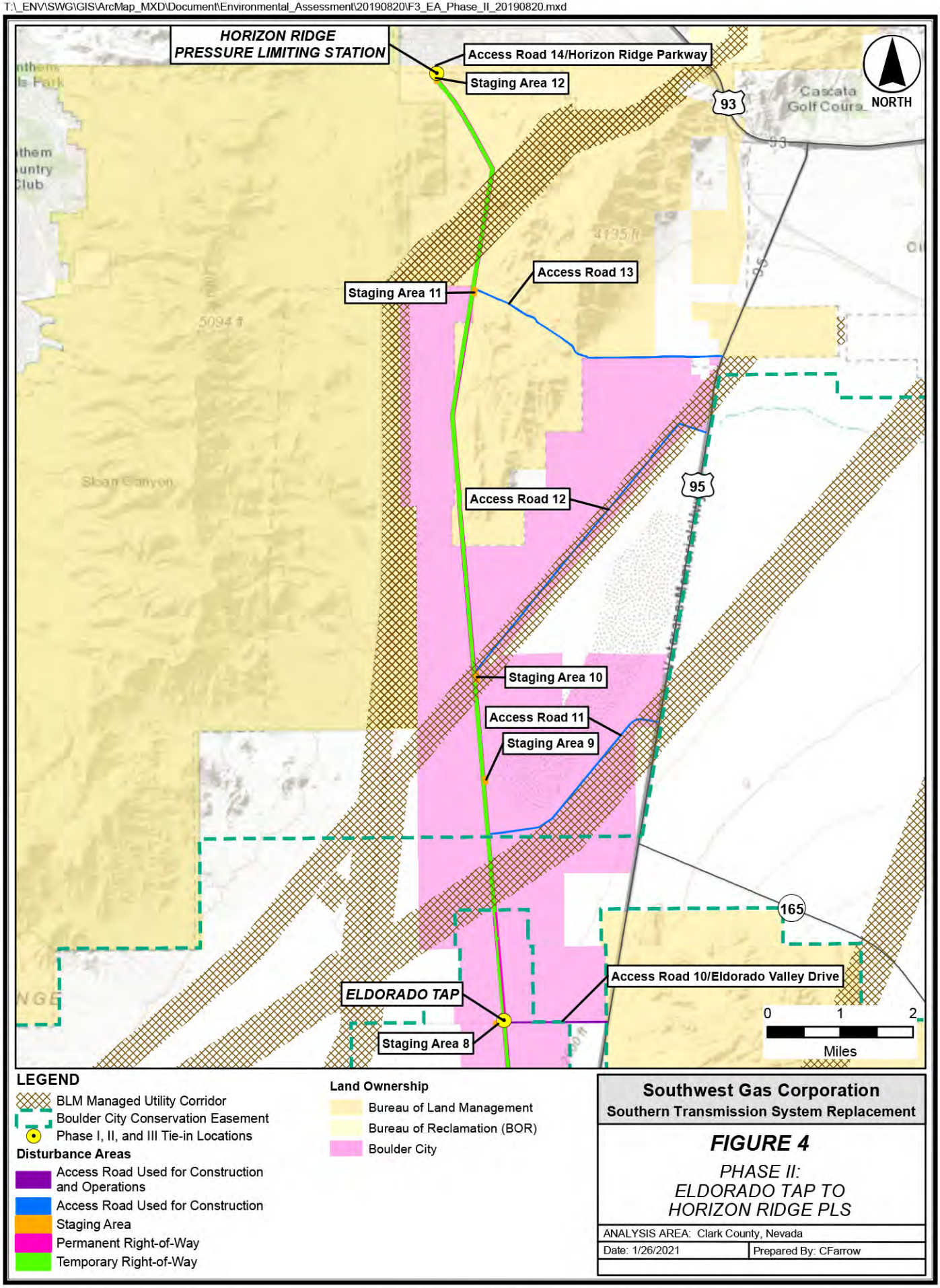


LEGEND

- BLM Managed Utility Corridor
- Boulder City Conservation Easement
- Phase I, II, and III Tie-in Locations

Disturbance Areas

- Access Road Used for Construction and Operations
- Access Road Used for Construction
- Staging Area
- Permanent Right-of-Way
- Temporary Right-of-Way

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation (BOR)
- Boulder City

Southwest Gas Corporation
Southern Transmission System Replacement

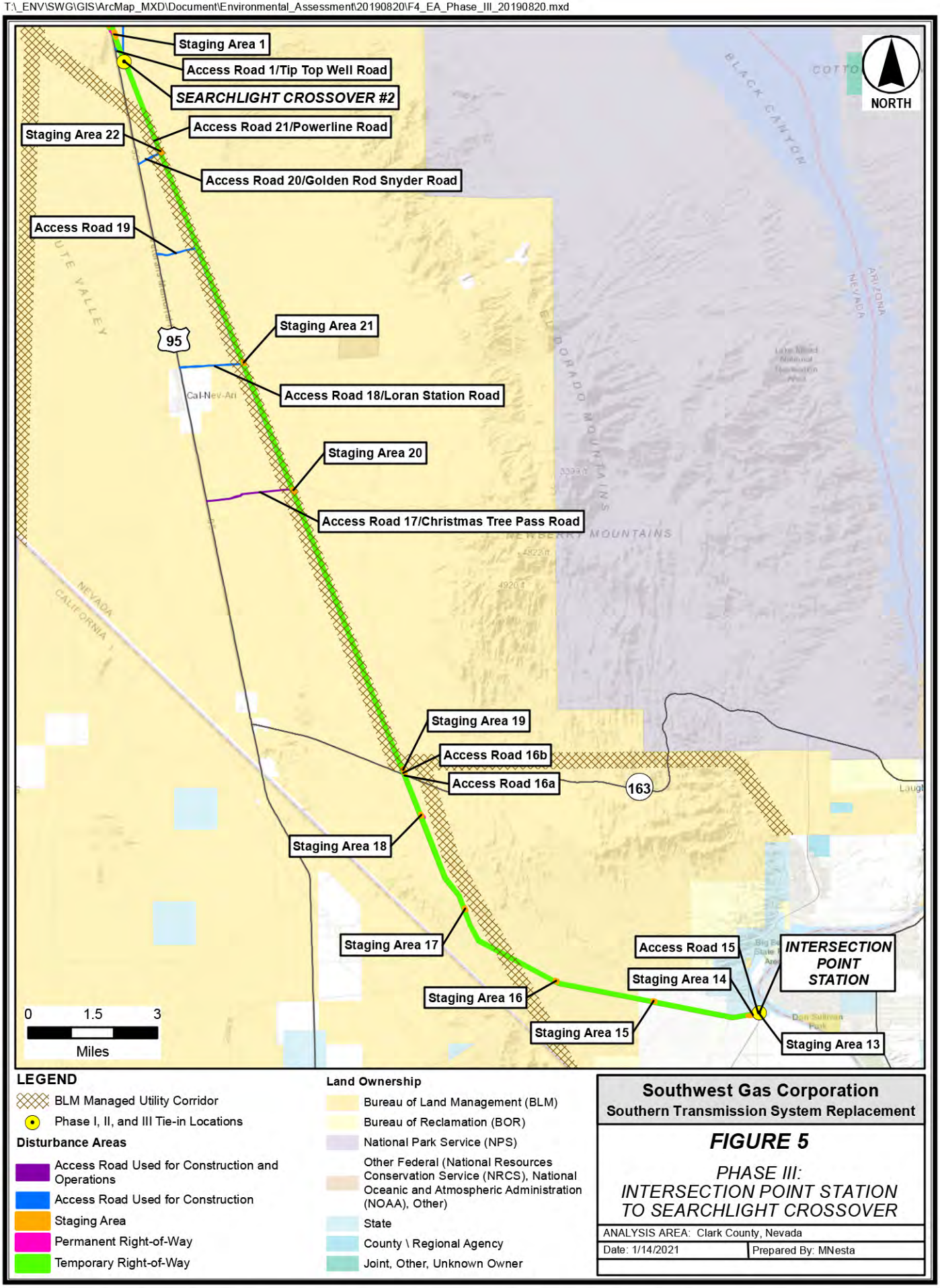
FIGURE 4

PHASE II:
ELDORADO TAP TO
HORIZON RIDGE PLS

ANALYSIS AREA: Clark County, Nevada

Date: 1/26/2021 | Prepared By: CFarrow

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20190820\F4_EA_Phase_III_20190820.mxd



LEGEND

- BLM Managed Utility Corridor
- Phase I, II, and III Tie-in Locations

Disturbance Areas

- Access Road Used for Construction and Operations
- Access Road Used for Construction
- Staging Area
- Permanent Right-of-Way
- Temporary Right-of-Way

Land Ownership

- Bureau of Land Management (BLM)
- Bureau of Reclamation (BOR)
- National Park Service (NPS)
- Other Federal (National Resources Conservation Service (NRCS), National Oceanic and Atmospheric Administration (NOAA), Other)
- State
- County \ Regional Agency
- Joint, Other, Unknown Owner

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 5

PHASE III:
INTERSECTION POINT STATION TO SEARCHLIGHT CROSSOVER

ANALYSIS AREA: Clark County, Nevada

Date: 1/14/2021 | Prepared By: MNesta

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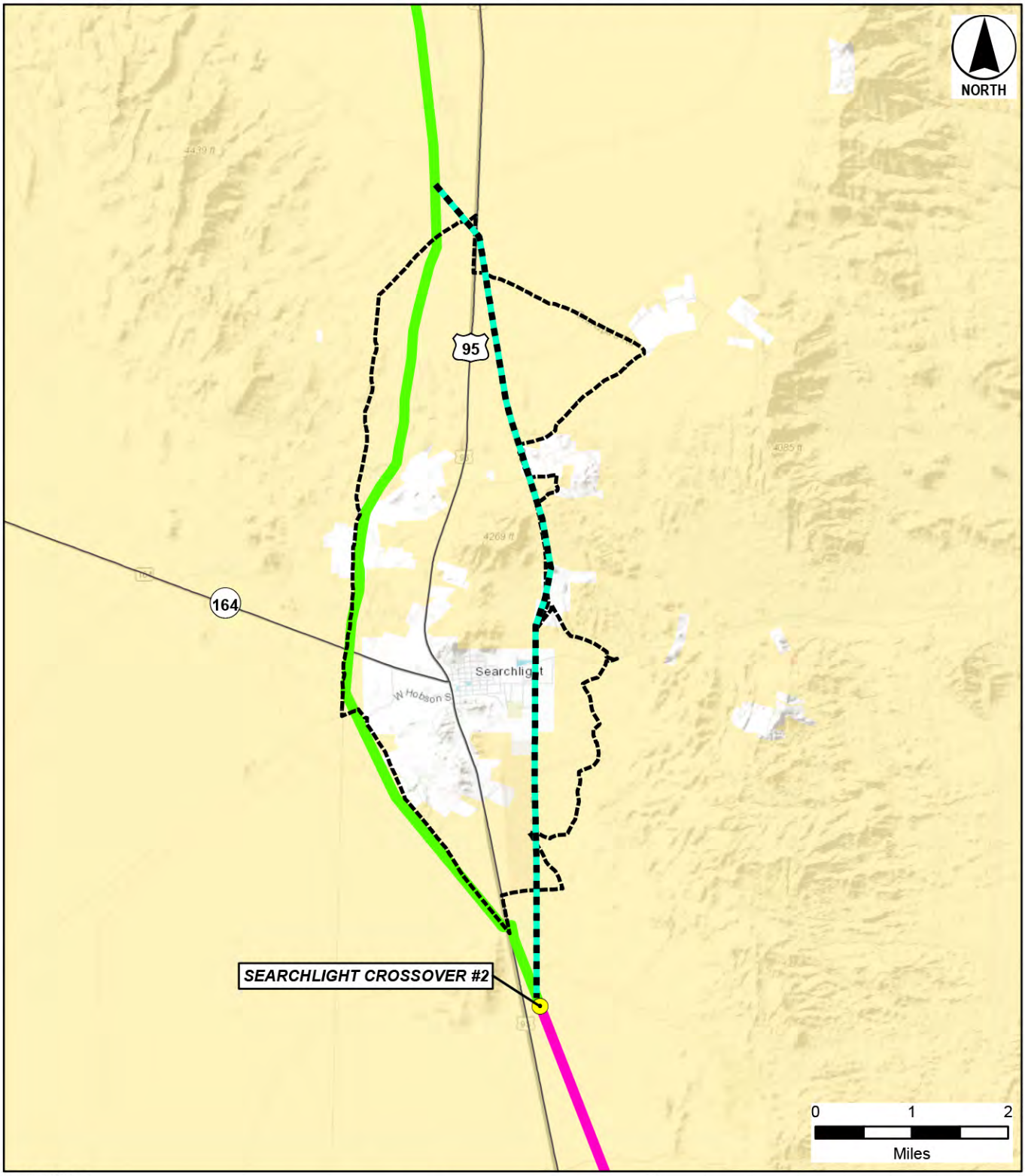

LEGEND

- Dismissed Alternative
- Town Limits of Searchlight

Project Construction Phases

- Phase I
- Phase III
- Phase I, II, and III Tie-in Locations

Land Ownership

- Bureau of Land Management (BLM)
- County \ Regional Agency

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 6

ALTERNATIVE CONSIDERED BUT DISMISSED

ANALYSIS AREA: Clark County, Nevada	
Date: 1/26/2021	Prepared By: CFarrow

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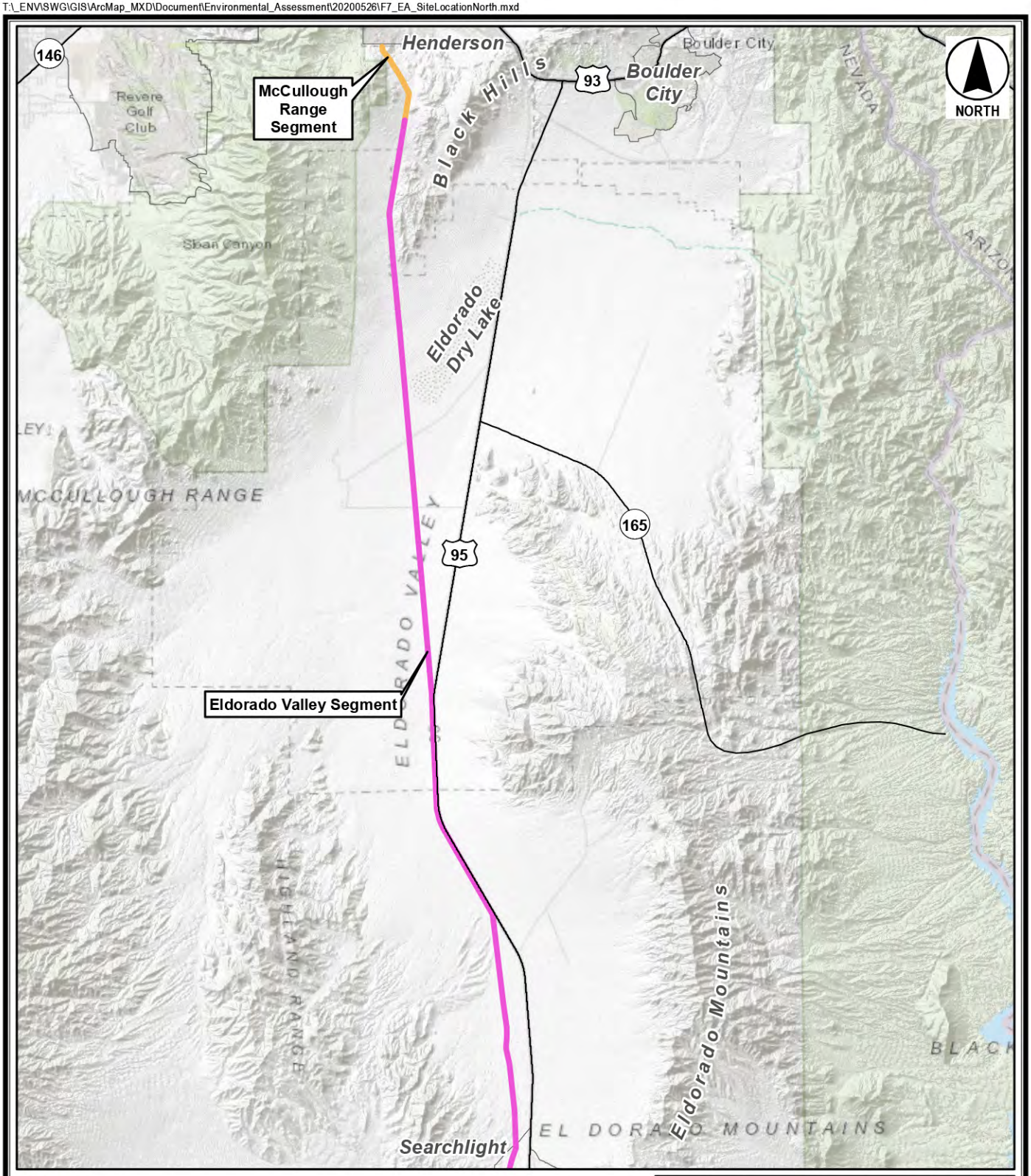

LEGEND

Project Segments

- McCullough Range Segment
- Eldorado Valley Segment

0 2 4

Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 7

SITE LOCATION MAP
NORTH HALF

ANALYSIS AREA: Clark County, Nevada	
Date: 5/26/2020	Prepared By: mnesta

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; STS Alignment data provided by SWG.

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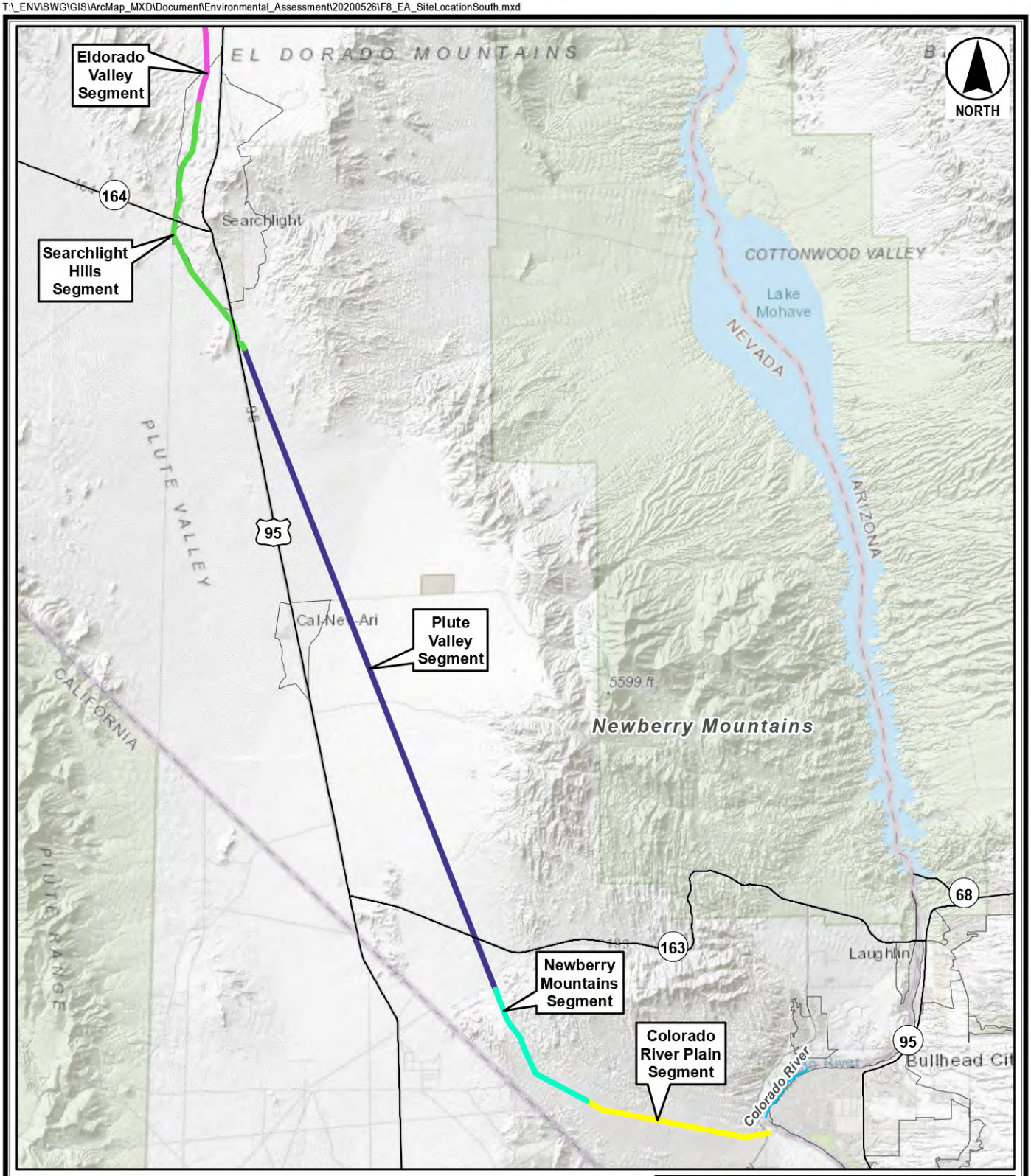

LEGEND

Project Segments

- Eldorado Valley Segment
- Searchlight Hills Segment
- Piute Valley Segment
- Newberry Mountains Segment
- Colorado River Plain Segment

0 2 4
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 8

SITE LOCATION MAP
SOUTH HALF

ANALYSIS AREA: Clark County, Nevada

Date: 5/26/2020 | Prepared By: mnesta

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; STS Alignment data provided by SWG.

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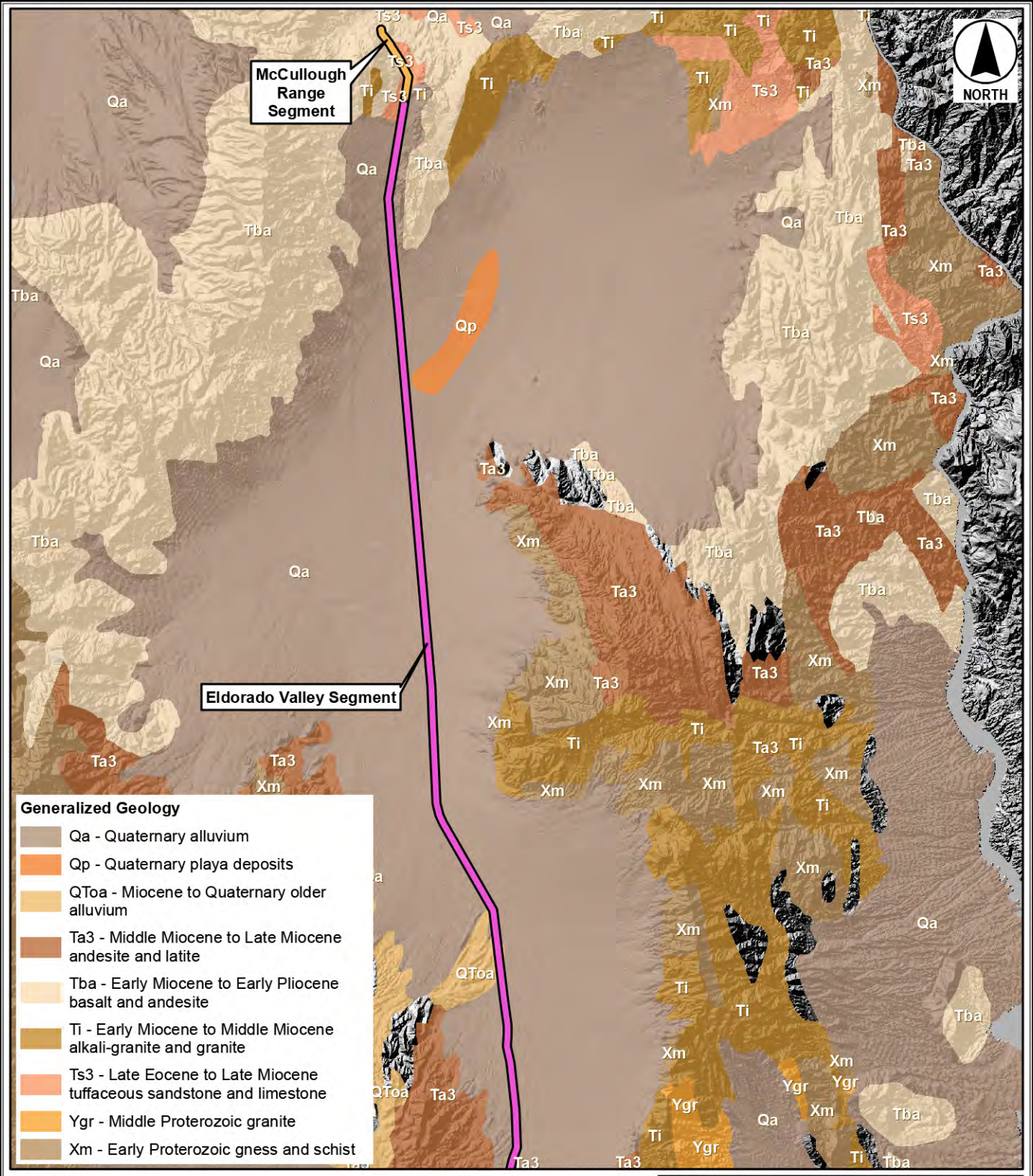

LEGEND

Project Segments

- McCullough Range Segment
- Eldorado Valley Segment

0 2 4
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 9

GENERALIZED GEOLOGICAL MAP, NORTH HALF

ANALYSIS AREA: Clark County, Nevada
Date: 5/26/2020 | Prepared By: mnesta

Service Layer Credits: ;STS Alignment data provided by SWG; Geology Data - U.S. Department of the Interior, U.S. Geological Survey

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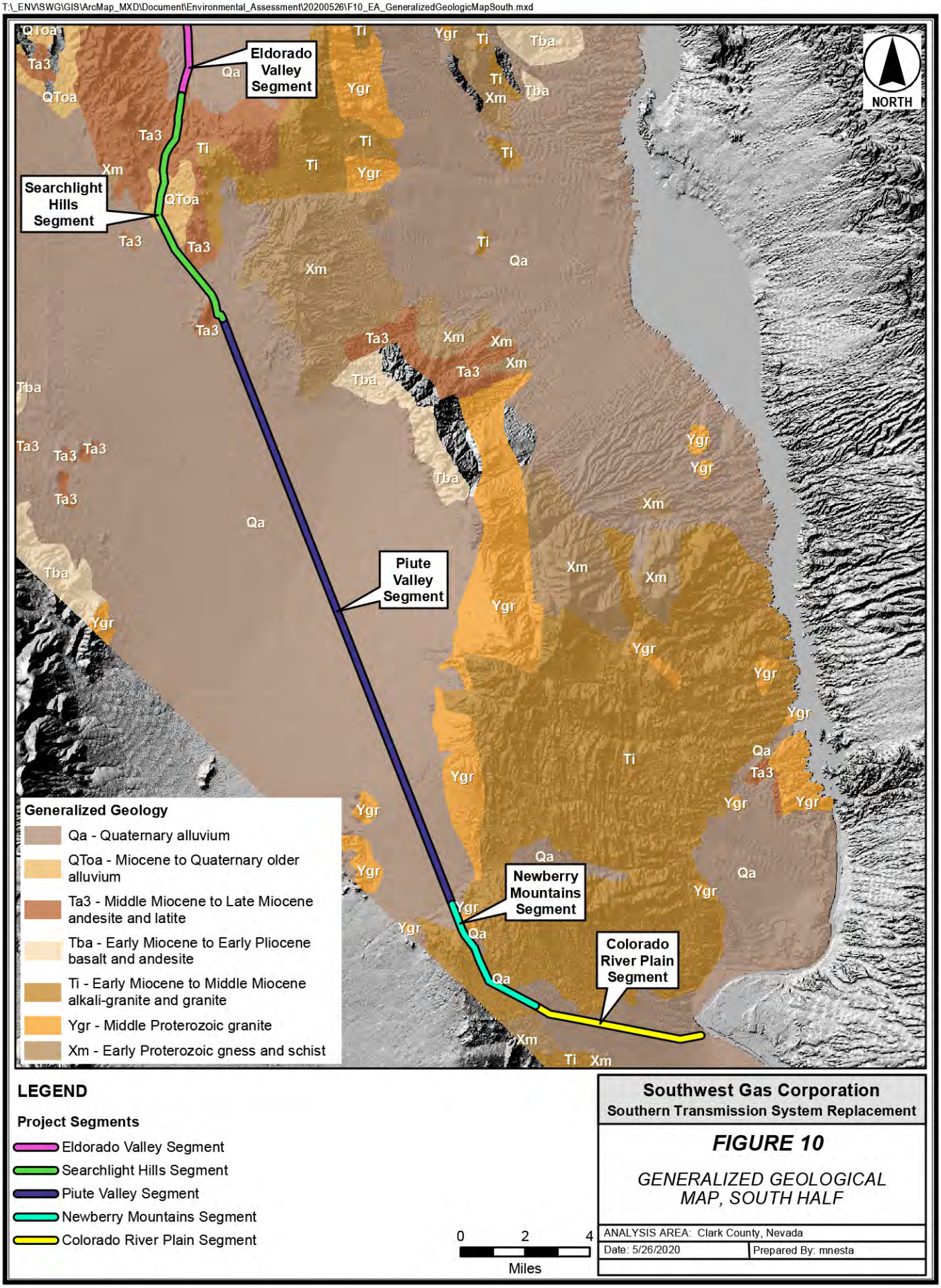

LEGEND

Project Segments

- Eldorado Valley Segment
- Searchlight Hills Segment
- Piute Valley Segment
- Newberry Mountains Segment
- Colorado River Plain Segment

0 2 4
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 10

GENERALIZED GEOLOGICAL MAP, SOUTH HALF

ANALYSIS AREA: Clark County, Nevada

Date: 5/26/2020 | Prepared By: mnesta

Service Layer Credits: ; STS Alignment data provided by SWG; Geology Data - U.S. Department of the Interior, U.S. Geological Survey

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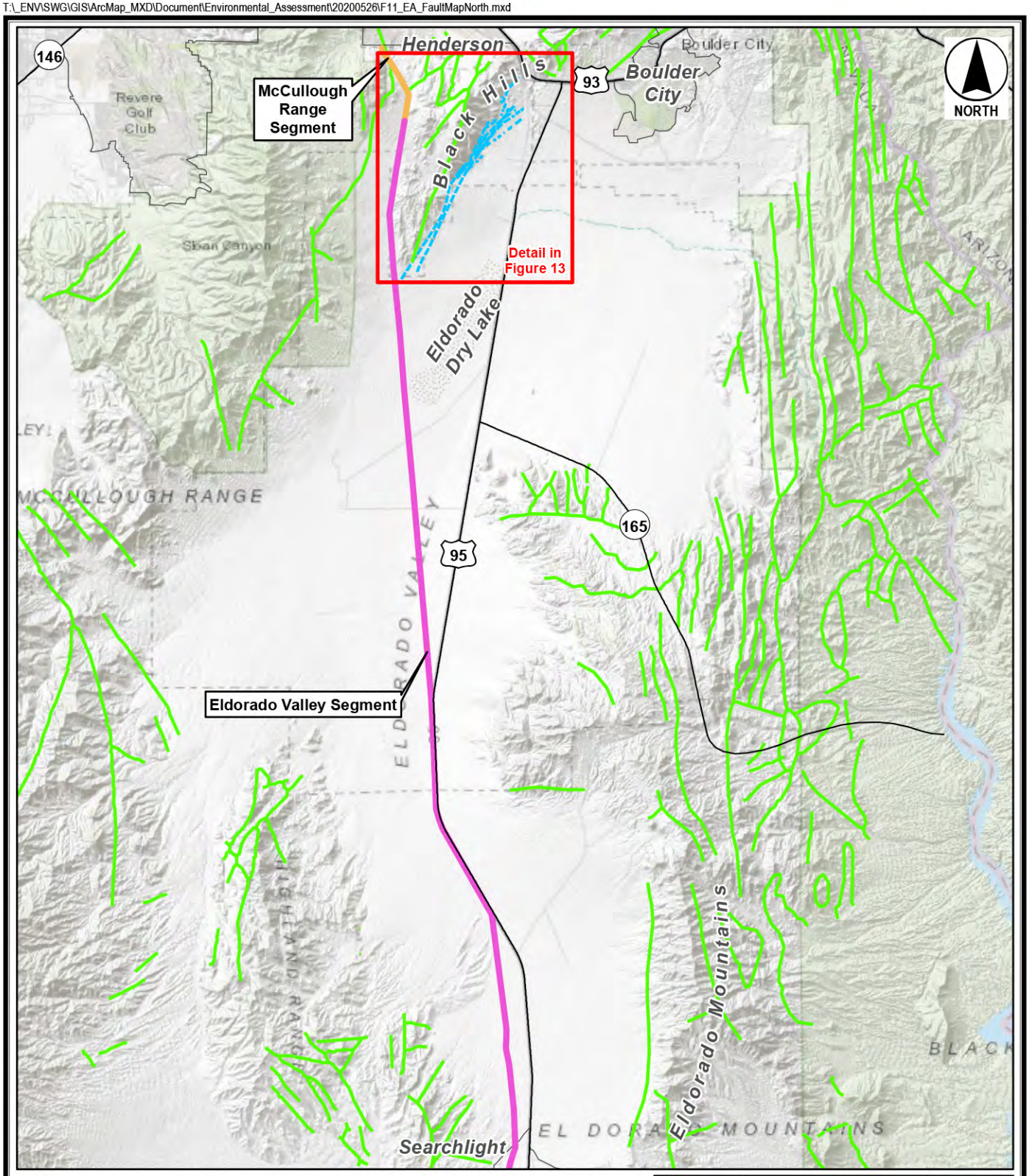

LEGEND

- Pre-Quaternary Fault
- Quaternary Fault

Project Segments

- McCullough Range Segment
- Eldorado Valley Segment

0 2 4
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 11

FAULT MAP, NORTH HALF

ANALYSIS AREA: Clark County, Nevada
Date: 5/27/2020 | Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; STS Alignment data provided by SWG; Geology Data - U.S. Department of the Interior, U.S. Geological Survey

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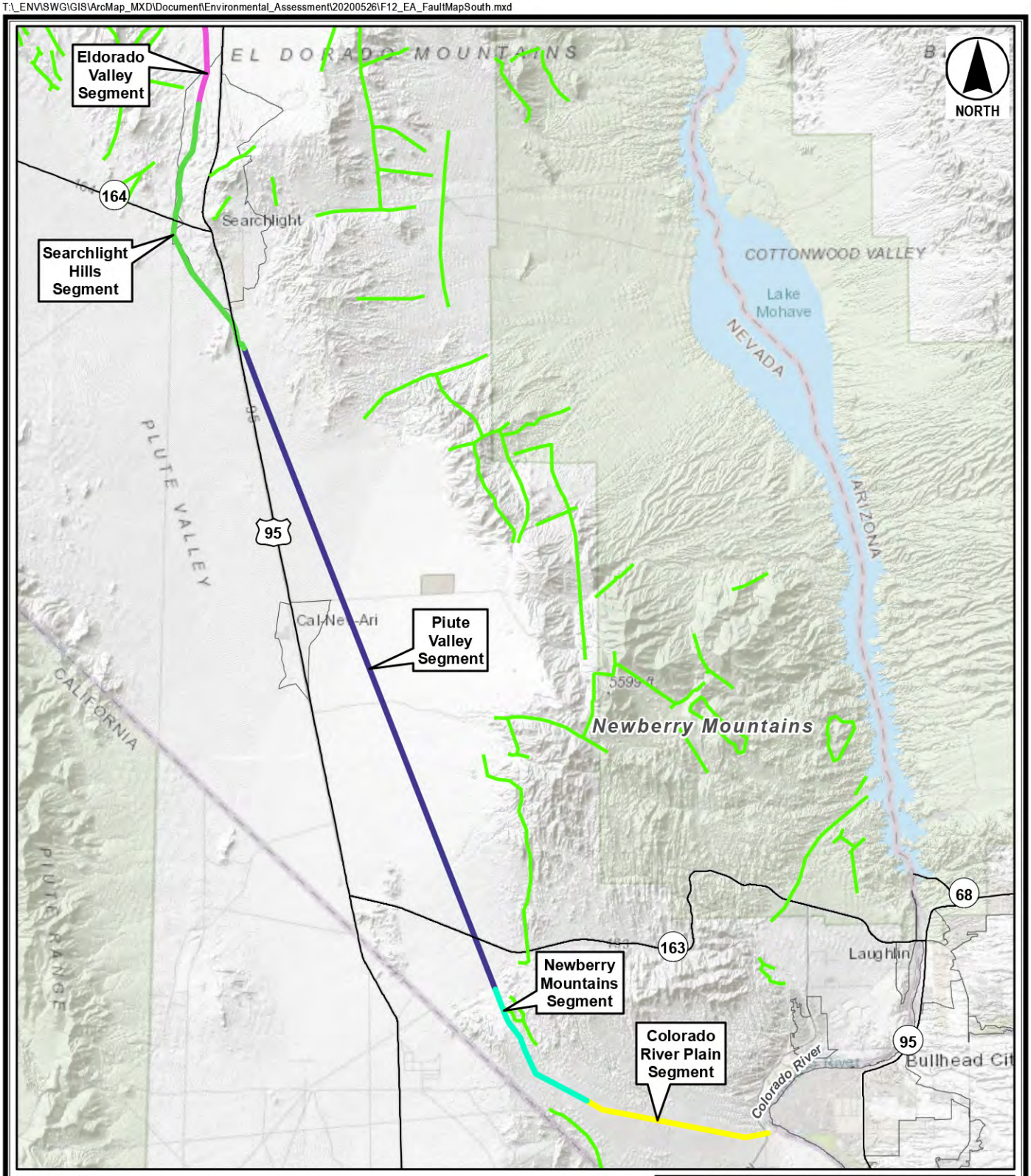


LEGEND

Pre-Quaternary Fault

Project Segments

- Eldorado Valley Segment
- Searchlight Hills Segment
- Piute Valley Segment
- Newberry Mountains Segment
- Colorado River Plain Segment

0 2 4
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

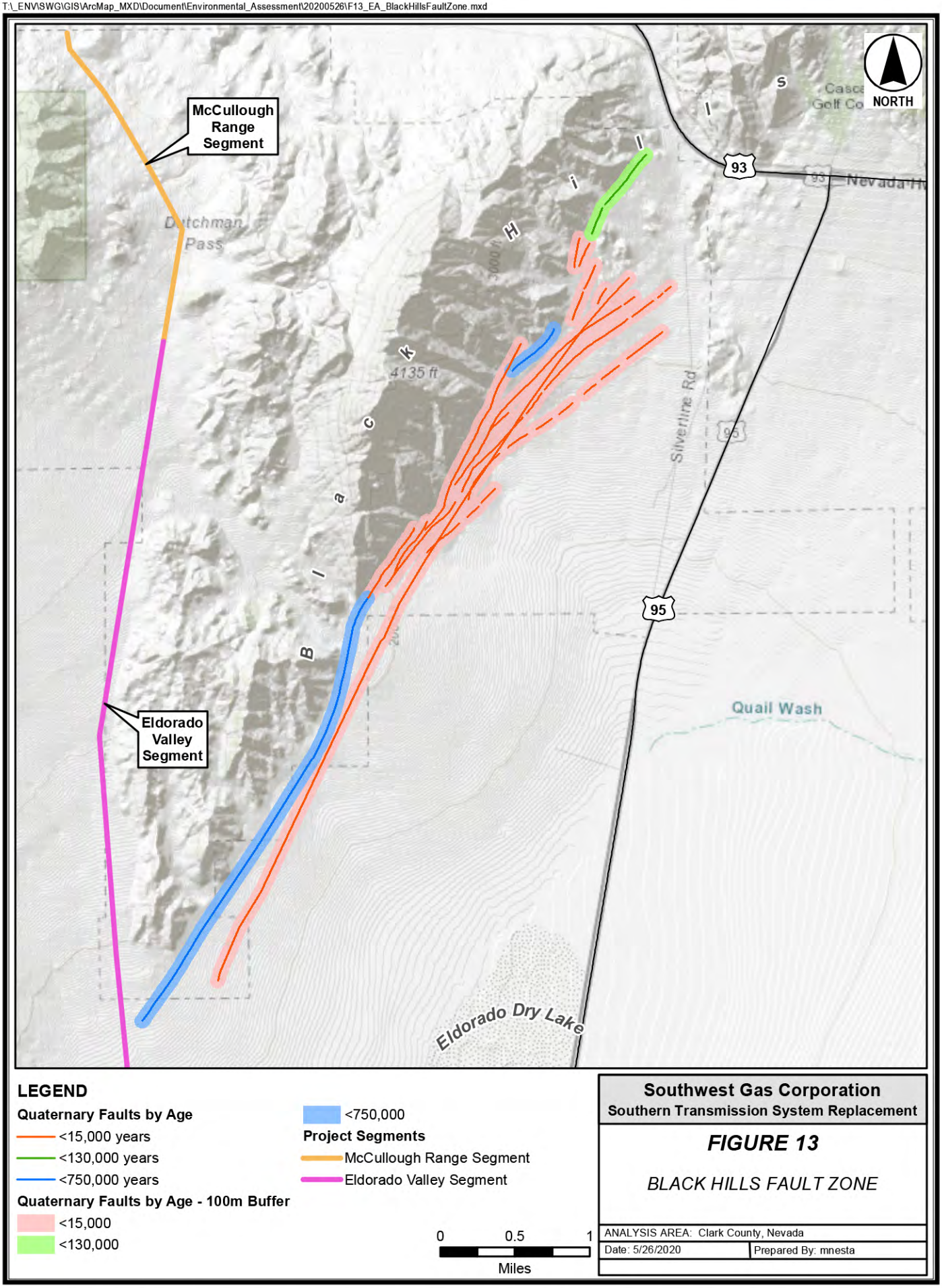
FIGURE 12

FAULT MAP, SOUTH HALF

ANALYSIS AREA: Clark County, Nevada

Date: 5/26/2020 | Prepared By: mnesta

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F13_EA_BlackHillsFaultZone.mxd



Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 13

BLACK HILLS FAULT ZONE

ANALYSIS AREA: Clark County, Nevada	
Date: 5/26/2020	Prepared By: mnesta

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; STS Alignment data provided by SWG; Geology Data - U.S. Department of the Interior, U.S. Geological Survey

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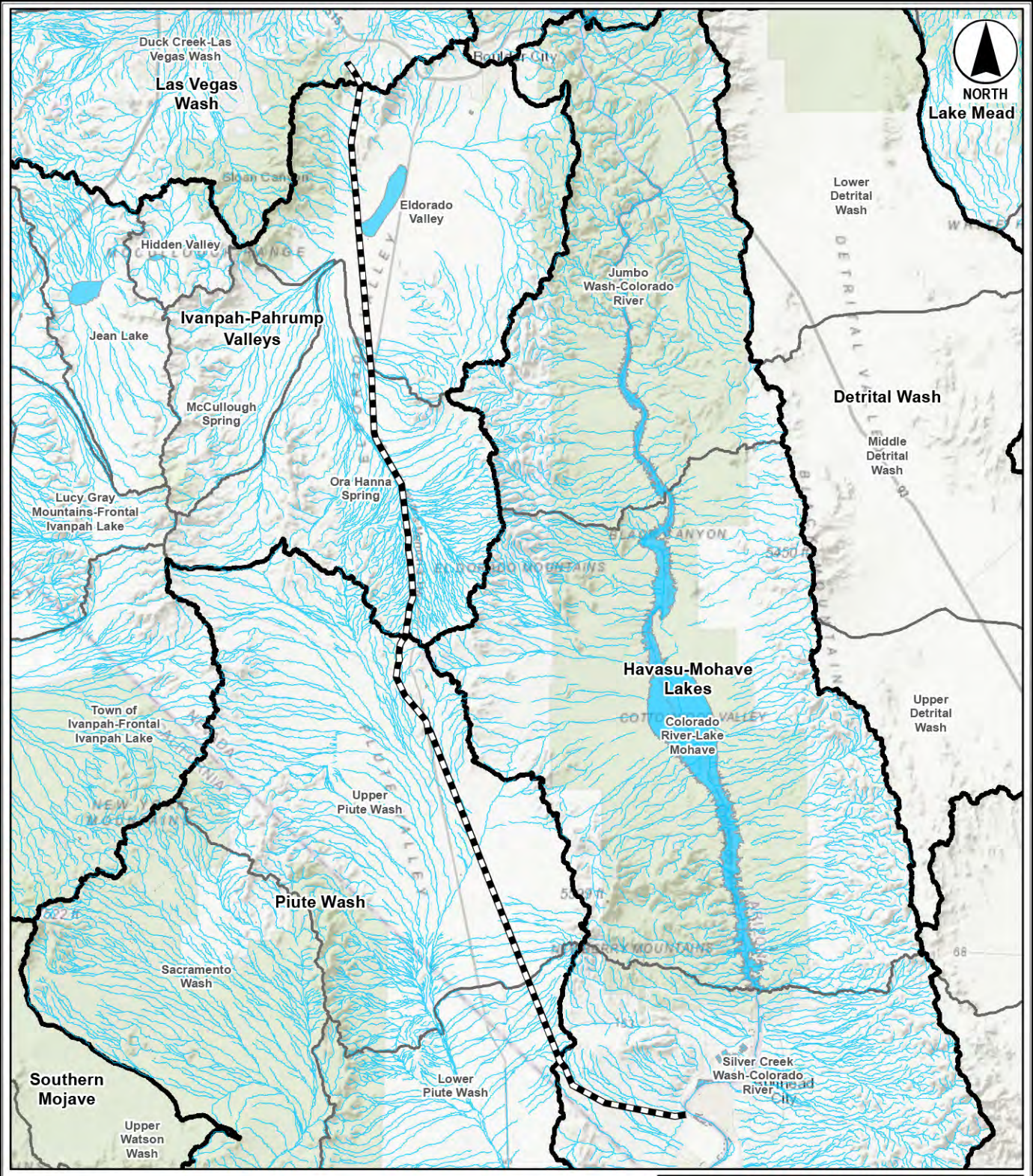


LEGEND

- Proposed Alignment
- Flowline
- Waterbody
- Watershed Boundary (HUC8)
- Subwatershed Boundary (HUC10)

0 5 10
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 14

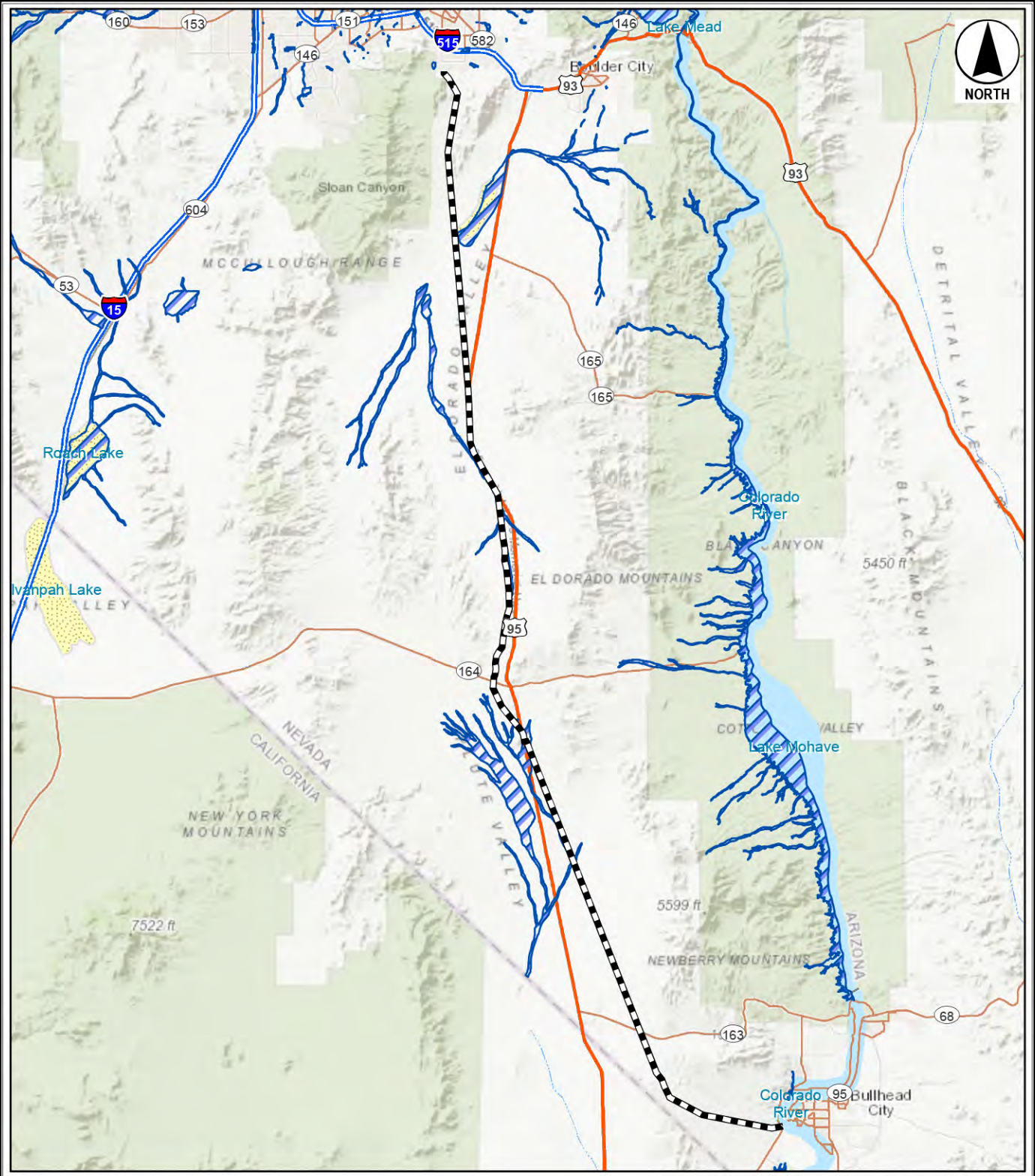
WATERSHEDS AND WATER RESOURCES IN THE VICINITY OF THE PROJECT

ANALYSIS AREA: Clark County, Nevada

Date: 5/27/2020 | Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; HUC Watershed Boundary - National Hydrology Dataset (NHD); Flowline and Waterbody data - National Hydrology Dataset (NHD); STS Alignment data provided by SWG.

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F15_EA_Water_Resources_FEMA.mxd



LEGEND

- Proposed Alignment
- Federal Emergency Management Agency (FEMA) Flood Hazard Zone A

0 5 10
Miles

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 15

FEMA FLOOD HAZARD ZONES IN THE VICINITY OF THE PROJECT

ANALYSIS AREA: Clark County, Nevada	
Date: 5/28/2020	Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; FEMA Flood Hazard Zones - Federal Emergency Management Agency (FEMA); STS Alignment data provided by SWG.

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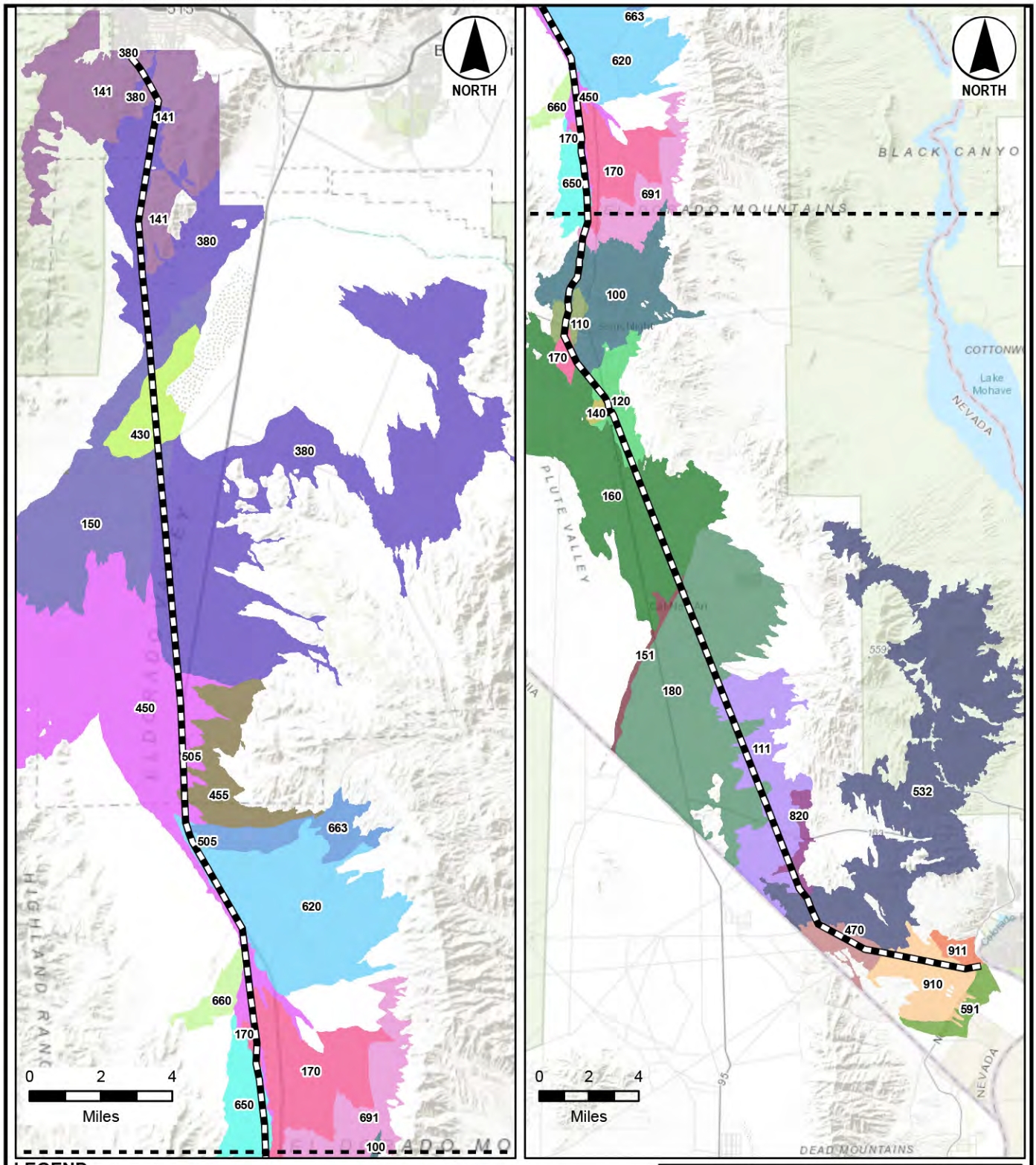


LEGEND

- 100 : Newera association
- 110 : Tenwell-Crosgrain association
- 111 : Tenwell-Shamock association
- 120 : Crosgrain-Tenwell association
- 140 : Haleburu extremely gravelly sandy loam
- 141 : Nipton-Haleburu-Rock outcrop association
- 150 : Hypoint gravelly sandy loam
- 151 : Bluepoint-Arizo association
- 160 : Lanip-Kidwell association
- 170 : Tenwell-Lanip association
- 180 : Kidwell-Tenwell association
- 380 : Tonopah-Arizo association
- 430 : Bluepoint-Tipnat-Grapevine association
- 450 : Arizo association
- 455 : Arizo-Tenwell association
- 470 : Filaree-Seanna association
- 505 : Pits, gravel
- 532 : Seanna-Goldroad-Rock outcrop association
- 591 : Riverbend-Carrwash association
- 620 : Arizo-Lanip association
- 650 : Peskah-Crosgrain association
- 660 : Crosgrain extremely gravelly loam
- 663 : Crosgrain-Kidwell-Arizo association
- 691 : Hoppswell-Jetmine association
- 820 : Newera-Rock outcrop association
- 910 : Carrwash-Riverbend association
- 911 : Carrwash association
- Proposed Alignment
- Match Line

Southwest Gas Corporation
Southern Transmission System Replacement

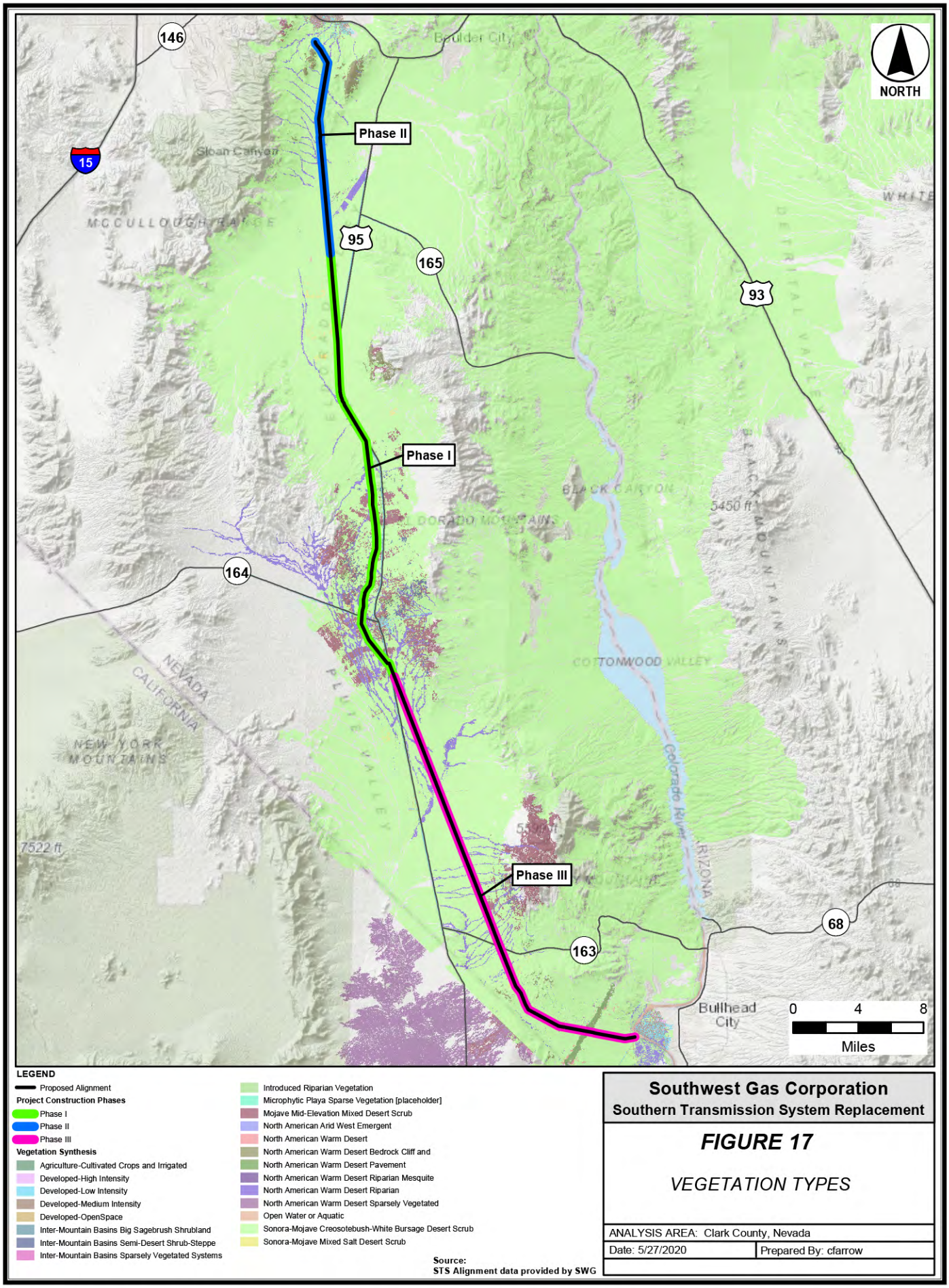
FIGURE 16

SOILS MAP

ANALYSIS AREA: Clark County, Nevada

Date: 5/27/2020 | Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; Soil Data - United States Department of Agriculture (USDA); STS Alignment data provided by SWG.



LEGEND

- Proposed Alignment

Project Construction Phases

- Phase I
- Phase II
- Phase III

Vegetation Synthesis

- Agriculture-Cultivated Crops and Irrigated
- Developed-High Intensity
- Developed-Low Intensity
- Developed-Medium Intensity
- Developed-OpenSpace
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Semi-Desert Shrub-Steppe
- Inter-Mountain Basins Sparsely Vegetated Systems
- Introduced Riparian Vegetation
- Microphytic Playa Sparse Vegetation [placeholder]
- Mojave Mid-Elevation Mixed Desert Scrub
- North American Arid West Emergent
- North American Warm Desert
- North American Warm Desert Bedrock Cliff and
- North American Warm Desert Pavement
- North American Warm Desert Riparian Mesquite
- North American Warm Desert Riparian
- North American Warm Desert Sparsely Vegetated
- Open Water or Aquatic
- Sonora-Mojave Creosotebush-White Bursage Desert Scrub
- Sonora-Mojave Mixed Salt Desert Scrub

Source:
STS Alignment data provided by SWG

Southwest Gas Corporation
Southern Transmission System Replacement

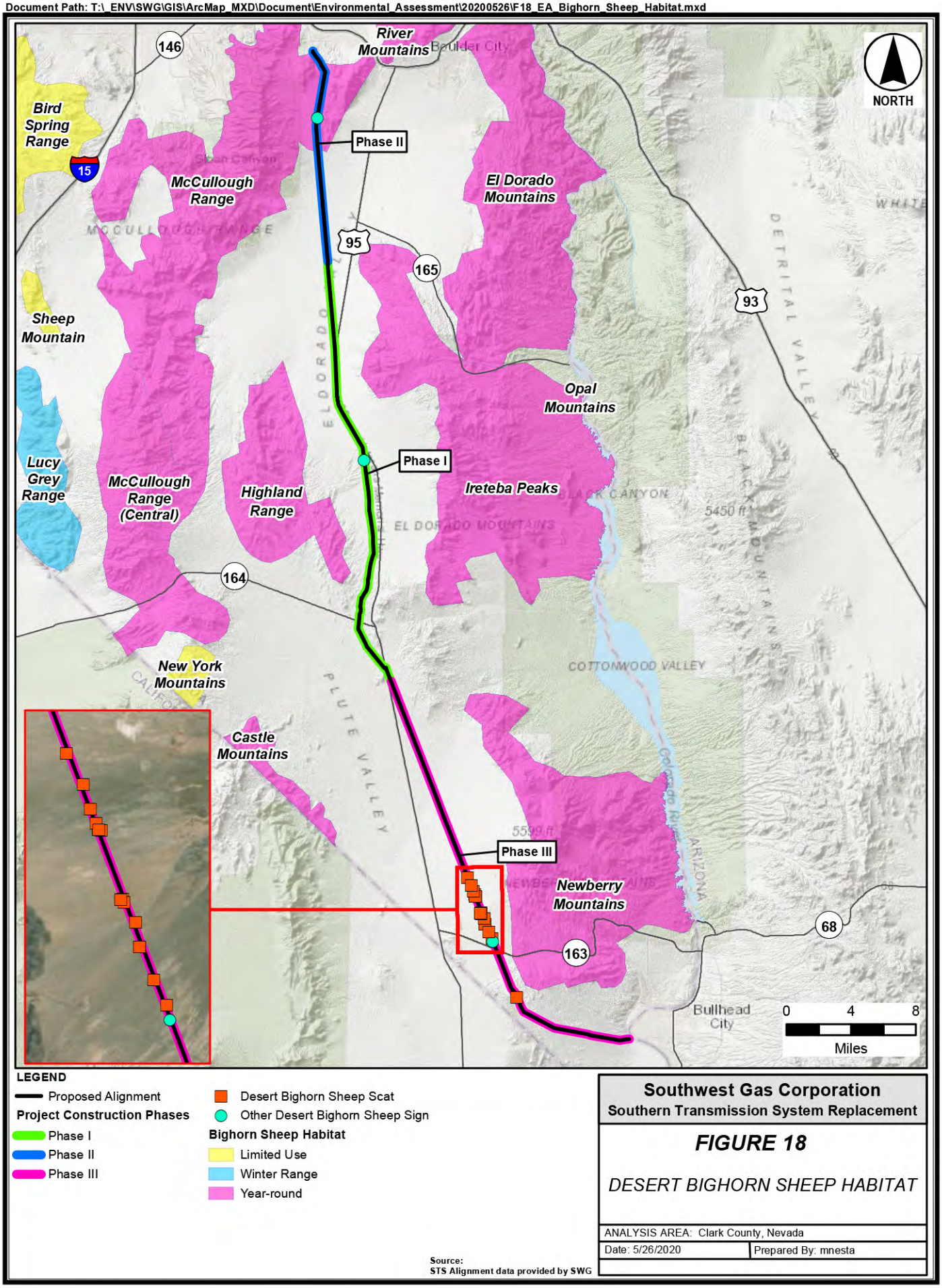
FIGURE 17

VEGETATION TYPES

ANALYSIS AREA: Clark County, Nevada	
Date: 5/27/2020	Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Document Path: T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F18_EA_Bighorn_Sheep_Habitat.mxd



LEGEND

- Proposed Alignment
- **Project Construction Phases**
  - Phase I
  - Phase II
  - Phase III
- Desert Bighorn Sheep Scat
- Other Desert Bighorn Sheep Sign
- **Bighorn Sheep Habitat**
  - Limited Use
  - Winter Range
  - Year-round

Source:
STS Alignment data provided by SWG

Southwest Gas Corporation
Southern Transmission System Replacement

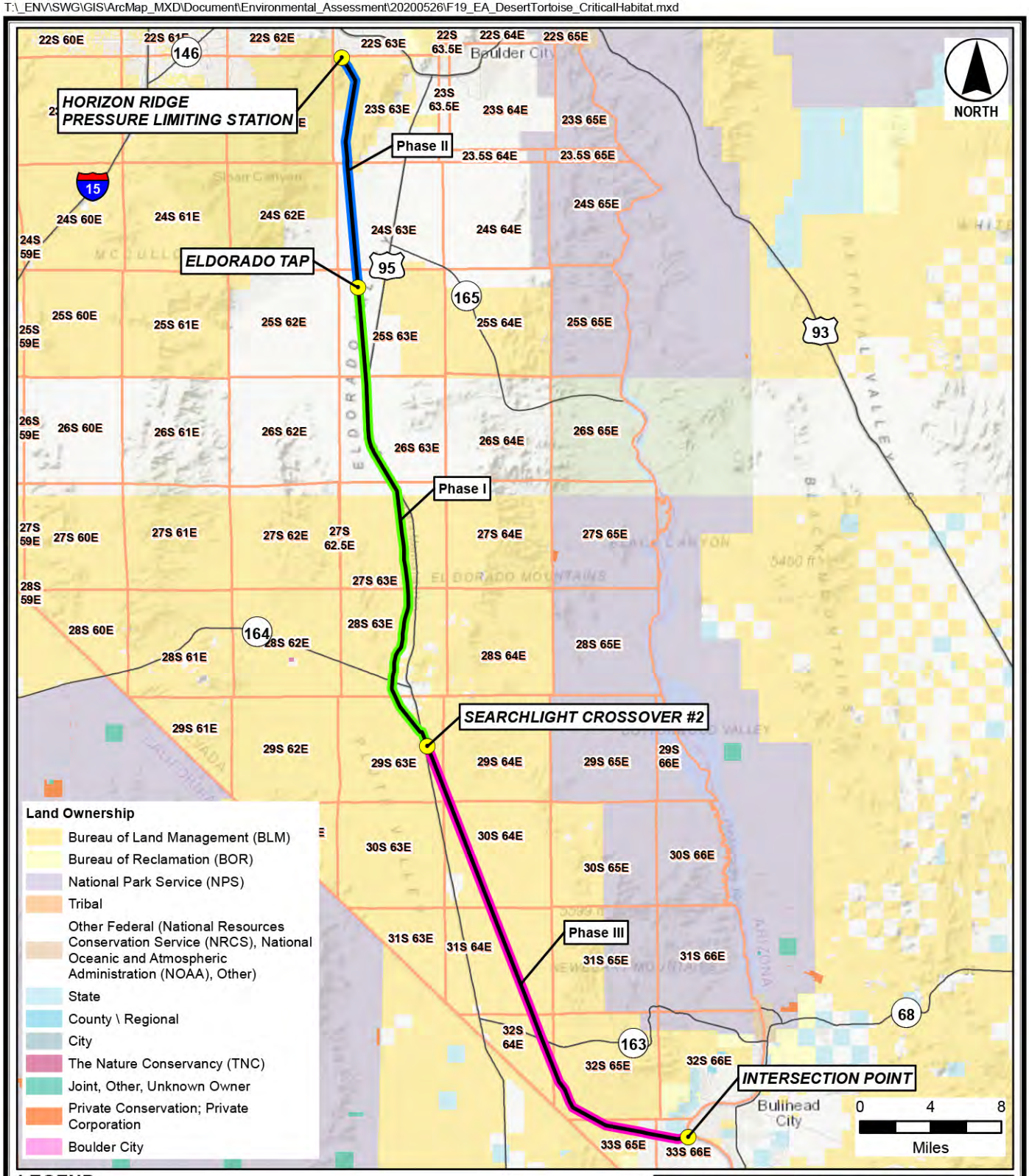
FIGURE 18

DESERT BIGHORN SHEEP HABITAT

ANALYSIS AREA: Clark County, Nevada

Date: 5/26/2020 | Prepared By: mnesta

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F19_EA_DesertTortoise_CriticalHabitat.mxd



LEGEND

- Proposed Alignment
- **Project Construction Phases**
  - Phase I
  - Phase II
  - Phase III
  - Phase I, II, and III Tie-in Locations
- Areas of Critical Environmental Concern (ACEC)
- Nevada Township Boundary
- Desert Tortoise Critical Habitat

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FIGURE 19

MOJAVE DESERT TORTOISE CRITICAL HABITAT

ANALYSIS AREA: Clark County, Nevada

Date: 1/26/2021 | Prepared By: CFarrow

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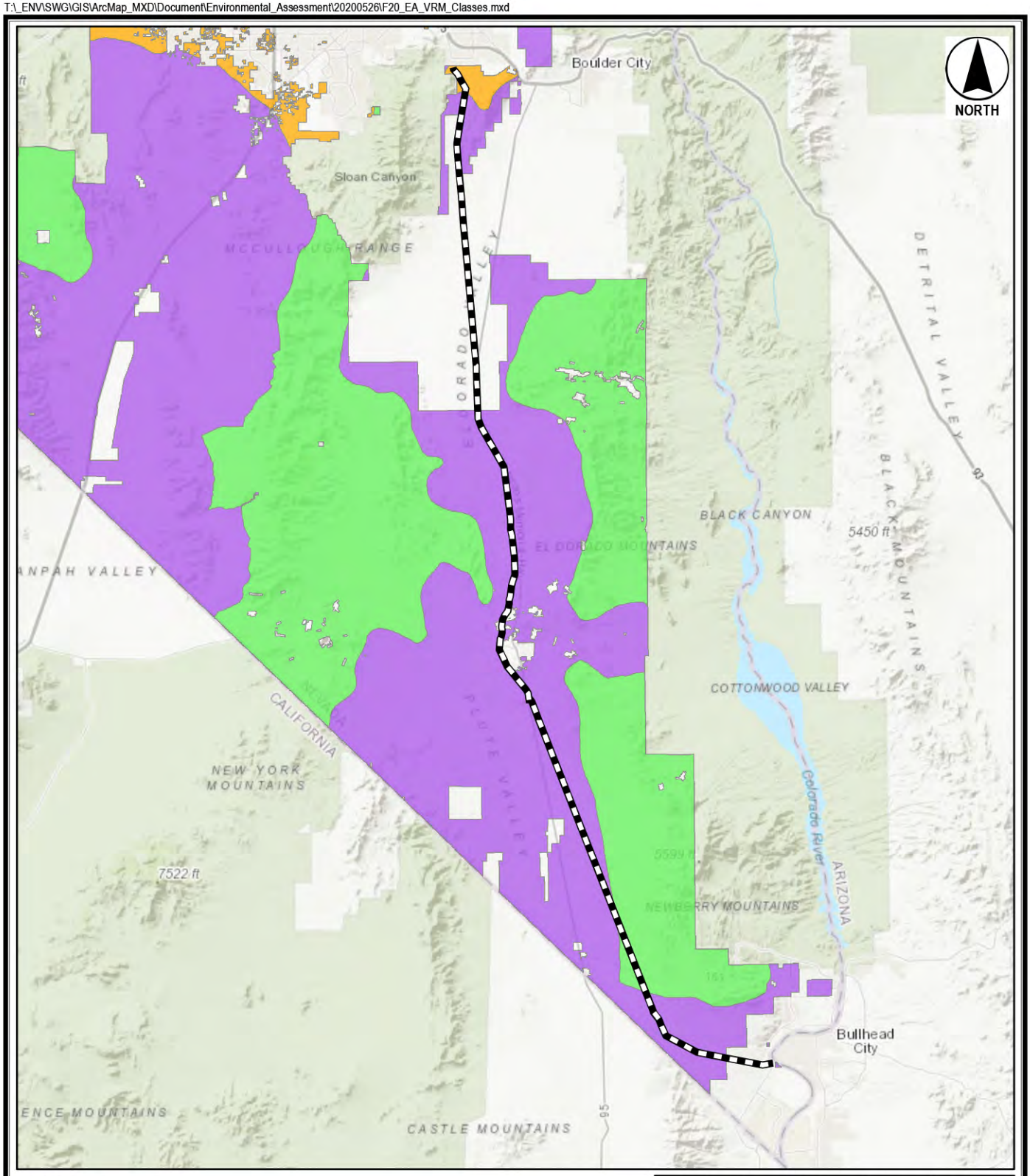


LEGEND

- Proposed Alignment
- Visual Resource Management (VRM) Class I
- VRM Class II
- VRM Class III
- VRM Class IV

0 5 10
Miles

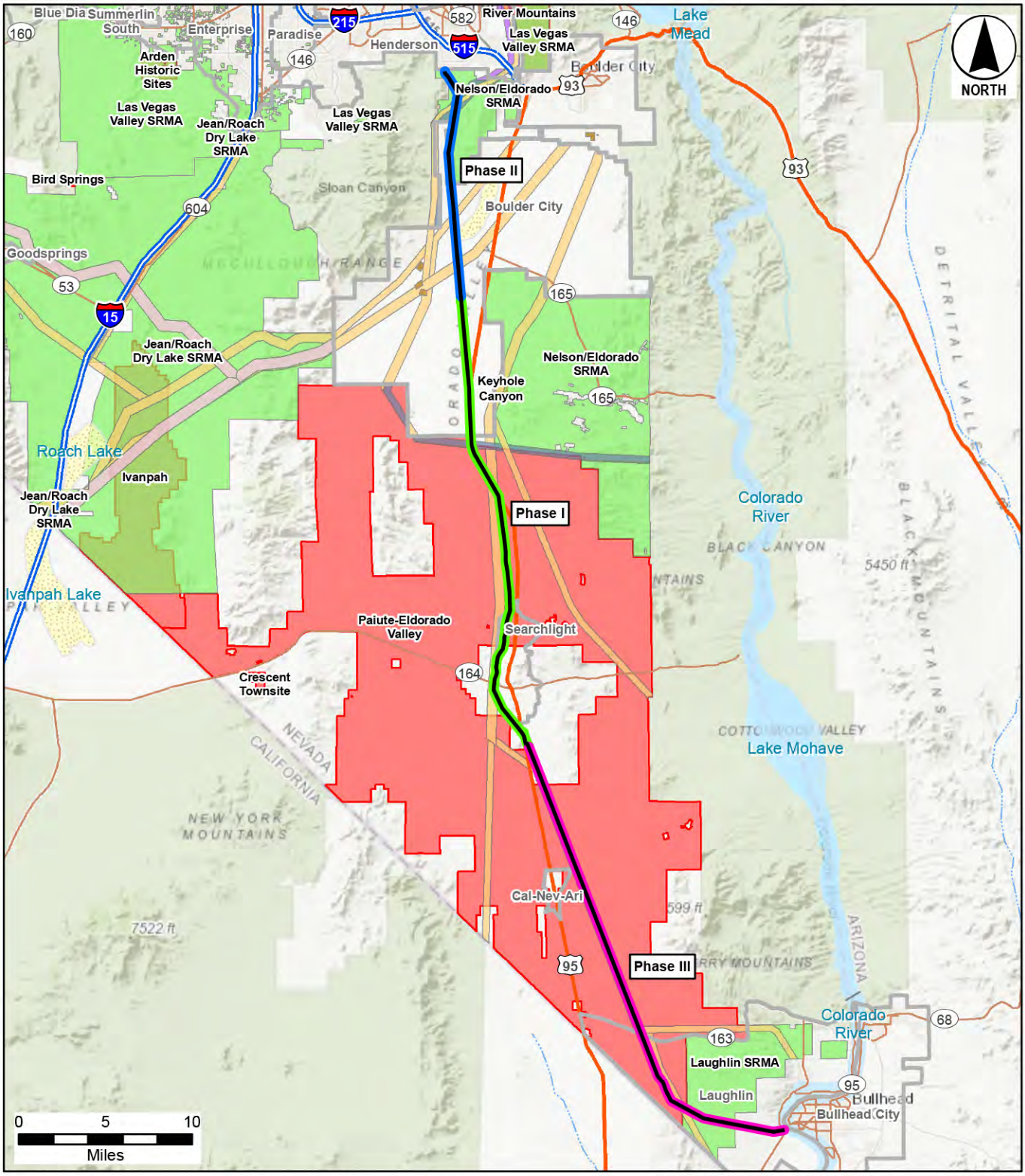
Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 20
BUREAU OF LAND MANAGEMENT (BLM) VISUAL RESOURCE MANAGEMENT CLASSES

ANALYSIS AREA: Clark County, Nevada
Date: 5/28/2020 | Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; VRM Class Desgnations - Bureau of Land Management (BLM); STS Alignment data provided by SWG.

T:_ENV\SWG\GIS\ArcMap_MXD\Document\Environmental_Assessment\20200526\F21_EA_BLM_Special_Land_Designations.mxd



LEGEND

- Proposed Alignment
- Project Construction Phase I
- Project Construction Phase II
- Project Construction Phase III
- Areas of Critical Environmental Concern
- Special Recreation Management Areas (SRMA)
- Corridor of Concern
- Corridor of Concern (Non-Bureau of Land Management [BLM])
- Power Substation
- Southern Nevada District Office Designated Corridor
- West Wide Energy Corridor
- City Outlines

Southwest Gas Corporation
Southern Transmission System Replacement

FIGURE 21

BLM SPECIAL LAND DESIGNATIONS

ANALYSIS AREA: Clark County, Nevada	
Date: 5/28/2020	Prepared By: cfarrow

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; Areas of Critical Environmental Concern (ACEC) - Bureau of Land Management (BLM); Special Recreation Management Areas - Bureau of Land Management (BLM); Utility Corridor Alternative - Bureau of Land Management (BLM); STS Alignment data provided by SWG.

APPENDIX F

LEGAL DESCRIPTION

Mount Diablo Meridian, Nevada

T. 23 S., R. 63 E.,
sec. 5, SW1/4SW1/4;
sec. 6, 1ots 2 and 3, S1/2NE1/4, N1/2SE1/4, and SE1/4SE1/4;
sec. 8, W1/2NW1/4, SE1/4NW1/4, N1/2SW1/4, and SW1/4SW1/4;
sec. 17, W1/2NW1/4 and W1/2SW1/4;
sec. 18, SE1/4SE1/4;
sec. 19, E1/2SE1/4;
sec. 20, S1/2NE1/4, N1/2NW1/4, SE1/4NW1/4, and NE1/4SE1/4;
sec. 21, SW1/4 and S1/2SE1/4;
sec. 26, SW1/4SW1/4;
sec. 27, S1/2SE1/4;
sec. 30, E1/2NE1/4 and NE1/4SE1/4;
sec. 31, E1/2NE1/4 and E1/2SE1/4
sec. 33, SE1/4SE1/4;
sec. 34, W1/2NE1/4, SE1/4NW1/4, N1/2SW1/4, and SW1/4SW1/4;
sec. 35, NW1/4NW1/4.

T. 24 S., R. 63 E.,
sec. 4, lots 6 and 7, S1/2NW1/4, N1/2SW1/4 and SW14/SW1/4;
sec. 5, SE1/4SE1/4;
sec. 6, 1ot 9, and SW1/4NE1/4;
sec. 7, SE1/4SE1/4;
sec. 8, N1/2NE1/4, SW1/4NE1/4, SE1/4NW1/4, N1/2SW1/4, and SW1/4SW1/4;
sec. 15, S1/2SW1/4;
sec. 16, SE1/4SE1/4;
sec. 18, E1/2NE1/4 and NE1/4SE1/4
sec. 29, SW1/4SW1/4;
sec. 30, SE1/4SE1/4;
sec. 31, NE1/4NE1/4;
sec. 32, W1/2NW1/4.

T. 25 S., R. 63 E.,
sec. 9, NW1/4NE1/4.

T. 26 S., R. 63 E.,
sec. 20, W1/2NE1/4, W1/2SE1/4, and SE1/4SE1/4;
sec. 28, SW1/4NW1/4, W1/2SW1/4 and SE1/4SW1/4;
sec. 29, E1/2NE1/4.
sec. 33, SW1/4NE1/4, E1/2NW1/4, and SE1/4;

T. 27 S., R. 63 E.,
sec. 3, 1ot 8, SW1/4NW1/4, SE1/4NW1/4, and SW1/4;
sec. 4, 1ot 5;
sec. 10, E1/2NW1/4 and E1/2SW1/4;
sec. 15, E1/2NW1/4, E1/2SW1/4, and SW1/4SE1/4;
sec. 22, W1/2NE1/4, NE1/4NW1/4, and W1/2SE1/4;
sec. 27, W1/2NE1/4 and W1/2SE1/4;
sec. 34, W1/2NE1/4, SE1/4NE1/4, and SE1/4.

T. 28 S., R. 63 E.,
sec. 2, W1/2SW1/4 and SE1/4SW1/4;
sec. 3, 1ot 1, SE1/4NE1/4, and E1/2SE1/4;
sec. 10, NE1/4 and W1/2SE1/4;
sec. 11, NW1/4 and E1/2SW1/4;
sec. 14, lots 2 and 7, SW1/4NE1/4, and E1/2NW1/4;
sec. 15, W1/2NE1/4, SE1/4NW1/4, and E1/2SW1/4;
sec. 22, 1ots 5, 6, 7, and 11, and SW1/4NW1/4;
sec. 23, lots 1, 3, and 4, SW1/4NW1/4 and E1/2SE1/4;
sec. 26, lots 1 and 6;
sec. 27, 1ot 5, and NW1/4SW1/4;
sec. 28, 1ot 3, E1/2SE1/4;
sec. 33, E1/2NE1/4 and E1/2SE14
sec. 35, N1/2NW1/4NE1/4NE1/4.

T. 29 S., R. 63 E.,
sec. 1, SW1/SW1/4
sec. 2, lot 19, SE1/4NE1/4 and SE1/4SE1/4;
sec. 3, lots 3 and 4, SE1/4NW1/4, NE1/4SW1/4, W1/2SE1/4, and SE1/4SE14;
sec. 10, NE1/4NE1/4;
sec. 11, NE1/4NE1/4, W1/2NW1/4, N1/2SW1/4, SE1/4SW1/4, and S1/2SE1/4;

sec. 12, W1/2NW1/4 and W1/2SW1/4;
sec. 13, W1/2NW1/4 and W1/2SW1/4;
sec. 14, N1/2NE1/4, SE1/4NE1/4, and NE1/4SE14;
sec. 24, NW1/4, E1/2SW1/4, and SW1/4SE1/4;
sec. 25, W1/2NE1/4, N1/2SE1/4, and SE1/4SE1/4;
sec. 36, N1/2NE1/4, SE1/4NE1/4, and NE1/4NW1/4.

T. 30 S., R. 63 E.,
sec. 12, SE1/4NE2/4.

T. 29 S., R. 64 E.,
sec. 31, 1ots 1 thru 4, and SE1/4SW1/4.

T. 30 S., R. 64 E.,
sec. 6, lot 3, SW1/4NE1/4, SE1/4NW1/4, NE1/4SW1/4, and W1/2SE1/4;
sec. 7, lot 2, NE1/4, NW1/4, SE1/4NW1/4, and E1/2SE1/4;
sec. 8, SW1/4SW1/4;
sec. 17, W1/2NW1/4, N1/2SW1/4, and SE1/4SW1/4;
sec. 19, SE1/4SW1/4, S1/2SW1/4;
sec. 20, SW1/4NE1/4, E1/2NW1/4, S1/2SW1/4, W1/2SE1/4, and SE1/4SE1/4;
sec. 28, W1/2SW1/4;
sec. 29, E1/2NE1/4 and NE1/4SE1/4;
sec. 33, NW1/4, E1/2SW1/4, and SW1/4SE1/4.

T. 31 S., R. 64 E.,
sec. 4, lot 2, S1/2NE1/4, S1/2SW1/4, and SE1/4;
sec. 5, S1/2SE1/4;
sec. 7, NE1/4NE1/4;
sec. 8, NW1/4NE1/4 and N1/2NW1/4;
sec. 9, NE1/4NE1/4;
sec. 10, W1/2NW1/4, W1/2SW1/4, and SE1/4SW1/4;
sec. 15, SW1/4NE1/4, E1/2NW1/4, NE1/4SW1/4, and W1/2SE1/4;
sec. 22, N1/2NE1/4, SE1/4NE1/4, and E1/2SE1/4;
sec. 23, SW1/4SW1/4;
sec. 26, W1/2NW1/4, SE1/4NW1/4, N1/2SW1/4, and SE1/4SW1/4;
sec. 35, W1/2NE1/4, NE1/4NW1/4, and SE1/4.

T. 32 S., R. 64 E.,
sec. 1, SW1/4NW1/4 and W1/2SW1/4;
sec. 2, 1ot 1, SE1/4NE1/4 and NE1/4SE1/4;
sec. 12, N1/2NW1/4, SE1/4NW1/4, E1/2SW1/4, and W1/2SE1/4;
sec. 13, W1/2NE1/4, SE1/4NE1/4, and E1/2SE1/4;
sec. 24, NE1/4NE1/4.

T. 32 S., R. 65 E.,
sec. 18, lot 4;
sec. 19, 1ots 1, 2, and 3, and E1/2SW1/4;
sec. 30, W1/2NE1/4, NE1/4NW1/4, N1/2SE1/4, and SE1/4SE1/4;
sec. 31, NE1/4NE1/4;
sec. 32, W1/2NW1/4, SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4, and SE1/4SE1/4;
sec. 33, S1/2SW1/4.

T. 33 S., R. 65 E.,
sec. 2, SW1/4NW1/4, N1/2SW1/4, and N1/2SE1/4;
sec. 3, 1ot 4, S1/2NE1/4, S1/2NW1/4, and NE1/4SE1/4;
sec. 4, lots 1 and 2, and SE1/4NE1/4.