KANE SPRINGS VALLEY GROUNDWATER DEVELOPMENT PROJECT BIOLOGICAL ASSESSMENT

Prepared for:

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1.0 INTRODUCTION

1.1 PURPOSE OF THIS BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) was prepared pursuant to Section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (Title 16, United States Code, Section 1531 et seq. [16 USC §§ 1531 et seq.]), to address potential effects by actions having a federal nexus on federally listed threatened and endangered species and, where applicable, their designated critical habitat. Specifically, this BA addresses the potential effects of actions associated with the Kane Springs Valley (KSV) Groundwater Development Project (Proposed Action) in response to a right-of-way (ROW) application submitted by the Lincoln County Water District (LCWD or Applicant) to construct and operate a system of regional water facilities in southern Lincoln County, Nevada (**Figure 1**). If granted, the ROW would allow LCWD to construct infrastructure required to pump and convey groundwater resources approved for pumping by the Nevada State Engineer and located in Lincoln County to help meet anticipated future water needs in the Coyote Spring Investment (CSI) development area.

Formal consultation is being requested for the Proposed Action. The project facilities would be located on public lands that are presently managed by the Ely Field Office of the U.S. Bureau of Land Management (BLM) and partially on private CSI lands.

The objectives of this BA are to (1) provide a conceptual framework of the background and need for the project, (2) describe the Proposed Action, (3) provide detailed information on the natural history of federally listed species potentially occurring in the vicinity of the project, (4) evaluate the potential effects of the Proposed Action on these species, (5) provide a determination of effect for the listed species, and (6) describe any conservation measures that could be implemented as reasonable and prudent measures to reduce incidental take associated with the Proposed Action or to promote conservation and recovery of listed species pursuant to Section 7(a)(1) of the ESA.

Under the direction of the BLM (Ely Field Office) ARCADIS U.S., Inc. (ARCADIS) conducted this BA pursuant to Section 7(c) of the ESA. Concurrent with the development of the BA, the BLM's Ely Field Office is preparing an environmental impact statement (EIS) to evaluate the potential impacts that would result from the approval of the issuance of ROWs under the Federal Land Policy and Management Act of 1976 (FLPMA) for the construction and operation of the Proposed Action and associated facilities. The Final EIS is expected to be available in December 2007.

Species listed as endangered by the United States Fish and Wildlife Service (USFWS) are species currently in danger of extinction throughout all or a significant portion of their range, and species listed as threatened are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. In this BA, the determination of effects for listed species is based on the best available scientific literature, a thorough analysis of the potential effects of the Proposed Action, and the professional judgment of the biologist(s) completing the evaluation.

Figure 1 Proposed Action and Alternative 1

One of five possible determinations was chosen based on the best available scientific literature. The five possible determinations (USFWS and NMFS 1998) are as follows:

- "No effect" – where no effect is expected;
- "May affect, but not likely to adversely affect" – where effects are expected to be beneficial, insignificant (immeasurable), or discountable (extremely unlikely);
- "likely to adversely affect" – where effects are expected to be adverse or detrimental;
- "is not likely to jeopardize the continued existence of the species" – where the effects are not likely to jeopardize the continued existence of a proposed species; and
- "is likely to jeopardize the continued existence of the species" – where the effects are likely to jeopardize the continued existence of a proposed species.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to develop a system for tapping underground water resources in the KSV Hydrographic Basin for municipal water purposes within the Coyote Spring Hydrographic Basin. Construction and operation of the Proposed Action would supply a small, but initially substantial, portion of the total water requirements for the CSI development projects in Lincoln County.

Lincoln County is approximately 98 percent public land with limited industrial and commercial development. The county ranks near the bottom among Nevada's counties in population, total personal and per capita income, and property tax revenues. Historically, the economy of Lincoln County has depended on agriculture, mining, mainline railroad operations, and federal defense initiatives. Lincoln County has sought to diversify and expand its economy during recent years due to the downturn in local mining productivity, the reduction of county-based railroad operations and maintenance activities, and termination of major Department of Energy weapons development programs at the Nevada Test Site.

Prior to the formation of the LCWD, entities located adjacent to Lincoln County were considering importing groundwater from Lincoln County to augment their water supplies. The Board of Lincoln County Commissioners realized that groundwater resources within the county would play a major role in the economic development of the county. In 1999, the Lincoln County Planning Commission prepared and distributed the Draft Lincoln County Water Plan for public review. The goals of the plan included development of water resources both inside and outside of Lincoln County in order to:

- Produce and distribute water to assist and support the needs of the local communities;
- Produce and distribute water to meet the needs of future economic development within Lincoln County boundaries; and
- Produce, purchase, wholesale, and transport water from sources inside and outside of Lincoln County to meet customer water needs across the region.

On June 11, 2003, Governor Kenny Guinn signed the *Lincoln County Water District Act*, which established the LCWD as a political subdivision of the state. The LCWD Act sets forth the powers of the water district and the form and method of governance of the district. Further, the passage of the LCWD Act created a single governmental entity with the authority to serve water to all real property located within the boundaries of Lincoln County.

On November 30, 2004, President George W. Bush signed the Lincoln County Conservation, Recreation, and Development Act (LCCRDA), which became Public Law No. 108-424. The third title of this legislation designated discrete multi-purpose utility corridors in Lincoln County for future utility infrastructure on federal lands.

The utility corridors were established for use by the LCWD and other entities contingent upon compliance with requirements of the National Environmental Policy Act (NEPA). The legislation also states that these corridors can be used for ROWs for the roads, wells, pipelines, and other infrastructure needed for the construction and operation of a water conveyance system in Lincoln County. The bill explicitly notes that the establishment of the utility ROW corridors, in and of themselves, has no bearing on water rights adjudications, which are solely under the jurisdiction of the Nevada State Water Engineer.

1.3 CONSULTATION HISTORY

Informal consultation with the USFWS was initiated for the Project by the BLM in a letter dated April 10, 2006. The USFWS, BLM, and LCWD then met on April 17, 2006 in Reno to discuss potential impacts to threatened and endangered species. The USFWS indicated during this meeting that a desert tortoise survey would likely be needed. ARCADIS submitted a Draft Desert Tortoise Survey Proposal (Draft Proposal) for the KSV Project on August 28, 2006. The Draft Proposal was reviewed by the USFWS, and a conference call with all interested parties was held on September 13, 2006 to discuss revisions. ARCADIS then submitted a Final Desert Tortoise Survey Proposal and received an email approval from the USFWS on September 26, 2006 to proceed with the surveys. A draft BA was submitted to the USFWS on July 20, 2007; USFWS responded with additional information requests in a letter dated September 4, 2007 (Williams 2007). This BA addresses those requests.

A formal response letter with a list of federally protected species that may occur in or near the project area was received from the USFWS on May 11, 2006 and is included in **Appendix A** (Williams 2006). This list was used in the preparation of this BA. The USFWS identified three federally listed and one candidate species that may occur in or near the project area. These species include the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and Moapa dace (*Moapa coriacea*), the threatened desert tortoise (*Gopherus agassizii*) (Mojave population), and the candidate yellow-billed cuckoo (*Coccyzus americanus*) (Western Distinct Population Segment). The desert tortoise is the only species that occurs within the project area. Additionally, designated critical habitat for the desert tortoise occurs within portions of the project area.

The USFWS species list includes species that do not occur within the project area but may be affected by the proposed action as a result of groundwater withdrawals. These three species include southwestern willow flycatcher, Moapa dace, and yellow-billed cuckoo. These species

are associated with the Muddy River, Virgin River, Pahranagat Valley, and Meadow Valley Wash. Information characterizing the habitat and populations is presented below.

In addition to the federally listed species, the USFWS recommended consideration of State of Nevada sensitive species, as listed by the Nevada Natural Heritage Program (NNHP), BLM sensitive species, and birds covered under the Migratory Bird Treaty Act (MBTA). Impacts to the special status species that are not listed under the ESA are addressed in the KSV Groundwater Development Project EIS currently under preparation.

2.0 DESCRIPTION OF THE PROPOSED ACTION

The LCWD is proposing to construct infrastructure required to pump and convey groundwater from the KSV Hydrographic Basin to the LCWD Service Territory in the Coyote Spring Valley in southern Lincoln County, Nevada. The majority of the proposed facilities would be located along or near the Kane Springs Road ROW, within the 2,640-foot wide LCCRDA utility corridor.

2.1 PRODUCTION WELLS

Groundwater from the KSV Hydrographic Basin would be supplied to the Coyote Spring Valley area from up to seven groundwater production wells. All wells would be located within the LCCRDA corridor and spaced approximately 1.3 to 1.8 miles apart to mitigate interference from multiple wells operating simultaneously. Approximate locations of these wells are shown on **Figure 1**. The first well (KPW-1), approved under BLM Serial Number NVN-079630, was drilled in 2005. Initial pump tests for this well indicate a flow rate of between 1,500 and 2,000 gallons per minute. If subsequent wells are equally productive, only one to two more wells would be required to obtain the permitted groundwater allocation. Final well locations would be determined through further field analysis and groundwater investigations.

Each wellhead would be enclosed in a masonry block structure meeting current Uniform Building Code construction standards and Lincoln County design requirements. Each structure would contain all aboveground piping, shutoff valve, check valve, flow meter, air release valve, electrical equipment and telemetry. The size of the permanent well yard would be approximately 150 feet by 150 feet.

Production wells would be equipped with a line-shaft vertical turbine pump powered by an electric motor. Based on preliminary production volumes, the power ratings for the well pump motors are expected to be between 400 horsepower (hp) and 700 hp; however, the final sizes of pumps and motors would be determined once well depths are established. Depth to groundwater is more than 900 feet below ground surface (URS 2006).

To protect the wellheads from vandalism and weather, and to minimize maintenance, each wellhead would be enclosed in a masonry block structure meeting current Uniform Building Code construction standards and Lincoln County design requirements. Each structure would contain all aboveground piping, shutoff valve, check valve, flow meter, air release valve, electrical equipment, and telemetry. The footprint for each building structure would be approximately 19 x 26 feet and would be enclosed inside an 8-foot high chain link fence that surrounds the well yard. The structure would be constructed on a foundation that is elevated slightly above the surrounding grade to help minimize the potential for facility flooding. Electric power would be provided to the production wells by the Lincoln County Power District (LCPD) via a 22.8 kilovolt (kV) circuit which would tie into the proposed overhead 69 kV/22.8 kV transmission line.

A 12.5 percent sodium hypochlorite (bleach) solution would be used to disinfect groundwater within the transmission pipeline. This solution is readily available in drums and in bulk at 12.5 percent concentration. The solution would be stored in a 2,500-gallon aboveground high-density

polyethylene tank located within the wellhead building. Secondary containment and related facilities would be provided in accordance with applicable Lincoln County Building Department and Uniform Fire Code regulations. Periodic chemical deliveries would be required approximately once every 3 weeks.

2.1.1 Monitoring Wells

An existing monitoring well, KMW-1, is located adjacent to KPW-1 (**Figure 1**). The monitoring well was installed in 2005 to assist in assessing the hydrogeology of the KSV Hydrographic Basin. A network of eight additional wells, located in Coyote Spring Valley to the south and east of the project area, is being used to monitor groundwater conditions in the area as identified in the USFWS Stipulated Agreement presented in **Appendix B**. Two new monitoring wells may also be installed per the Stipulated Agreement.

2.1.2 Pipelines

There are two types of pipelines associated with the Proposed Action – 1) the well field pipeline collection system and 2) the main transmission pipeline. Ancillary pipeline components include isolation valves, cathodic protection, control valves, air release/vacuum valves, blow-off valves, access manways, fiber optic splice vaults, and pipe alignment markers.

2.1.2.1 Well Field Pipeline Collection System

The well field pipeline collection system will consist of individual branch pipelines from each well to a single main collection pipeline terminating at the forebay storage tank. The total pipeline collection system would extend approximately 9.4 miles. The pipeline, to be constructed of ductile iron, would vary in size (telescope) from 12 inches to 24 inches in diameter, with the largest diameters located closest to the forebay storage tank. The final length and diameter of the pipeline would be based on well locations and established flow rates of each well. The pipeline would be buried to a minimum depth of 3 feet below grade, or three times scour depth in washes in accordance with engineering requirements.

The pipelines would be located primarily on the south side of Kane Springs Valley Road within the permitted ROW. In general, the pipeline would parallel Kane Springs Valley Road with a 60-foot wide construction easement and a 30-foot wide permanent easement. If cross-country construction is required, the temporary construction easement would be 75 feet wide, with a permanent easement of 60 feet.

2.1.2.2 Transmission Pipeline

Approximately 3.8 miles of buried 24-inch diameter transmission pipeline would be constructed adjacent to the Kane Springs Valley Road between the forebay storage tank and the terminal storage tank. A 60-foot construction easement and a 30-foot permanent easement would be required. Due to topographic conditions, the pipeline would be pressurized only by the forebay tank; no booster pump station would be required at this time (subject to final design).

Appurtenant groundwater facilities (e.g., isolation valves, control valves) would occur, on average, every mile along the alignment. These facilities would be located predominantly below

existing grades in traffic-rated, lockable, concrete vaults that would vary in dimension. Typically, these vaults would be located outside of traffic areas and may require small location markers extending several feet above the surface of the ground.

2.1.3 Storage Tanks

A 50,000-gallon forebay storage tank would be installed adjacent to the existing production well (KPW-1) and would initially serve as the termination point for the groundwater collection system. This tank would be used to normalize flow pressures in the system and provide storage for secondary lifting to the terminal storage tank, if required.

The water level in the forebay storage tank would control the operation of the well field via telemetry. Either wireless telemetry or direct-burial fiber optic telemetry cable located in pipeline trenches would enable communication between the collection system, forebay storage tank, and the terminal storage tank.

A terminal water storage tank would ultimately be located at the southern end of the water transmission pipeline to receive the imported water and to serve as a water distribution source for the northern Coyote Spring Valley area. The storage tank would be constructed with a maximum capacity of 700,000 gallons, subject to final design requirements. Construction of the terminal water storage tank is not anticipated to occur during Phase I.

2.1.4 Power Distribution

In order to provide reliable electric service to the well fields, LCPD would construct and operate approximately 2.7 miles of 138 kV overhead transmission line east of U.S. Highway 93 and south of the existing Kane Springs Valley Road from LCPD's existing transmission line, currently located west of Highway 93. LCPD would also construct a 138 kV to 69 kV/2.8 kV step-down substation (Emrys Jones Substation) approximately 2.7 miles east of Highway 93 and south of Kane Springs Valley Road. From this substation, an overhead transmission line with 69 kV/22.8 kV distribution circuit would be routed along Kane Springs Valley Road to the proposed well fields, a total distance of 14.0 miles. At each well location, a 69 kV/22.8 kV to 4.16 kV pad-mounted step-down transformer located at each substation site (approximately 155 feet by 95 feet) would be constructed to serve the planned pump motor and ancillary equipment. The proposed facilities are described in more detail in the following subheadings.

2.1.4.1 138-kV Transmission Line

A new, 2.7-mile long, 138 kV transmission line would be constructed from LCPD's existing transmission line to the new Emrys Jones Substation. The 138 kV transmission line would be a double-circuit line constructed on self-supporting galvanized steel structures. Pole heights would vary depending on terrain and would range between 65 feet to 80 feet. Diameter at the base of the structure would range from 3 to 7 feet. Each structure would require a temporary construction easement of 0.30 acre (130 feet by 100 feet) and, after construction, each structure would occupy 0.06 acre (90 feet by 30 feet). The 138 kV transmission line would be located on private property east of U.S. Highway 93 and south of Kane Springs Road.

The span length between structures would range between 300 feet and 700 feet, depending on terrain (7 to 9 poles per mile). Shield wire would be installed to protect the transmission line from direct lightning strikes. The entire proposed transmission line would parallel Kane Springs Valley Road. Small 12-foot wide access spur roads may be needed to access some locations. Access roads would be constructed within the permitted ROW and in accordance with BLM and/or county specifications. LCPD would coordinate with adjacent utilities to provide common access for construction and maintenance.

Any transmission structures constructed for the Proposed Action would have clearances between phase conductors or between phase conductors and grounded hardware (as recommended by APLIC [1996]) that are sufficient to protect even the largest birds, and therefore would present little to no risk of bird electrocution. With the application of appropriate construction designs for all transmission lines and their towers, impacts associated with bird electrocution should be minimized. Additionally, anti-perching devices will be installed on transmission structures to discourage predatory birds from perching on these structures while hunting.

2.1.4.2 Emrys Jones Substation

The Emrys Jones Substation is a new substation proposed for construction on private property approximately 2.7 miles east of Highway 93 and south of Kane Springs Valley Road. The substation would occupy a fenced area of 420 feet by 360 feet. The Emrys Jones Substation would be constructed at the end of the 138 kV transmission line in order to provide service to the well fields. The substation would be planned and sized for future electrical needs in the northern Coyote Spring Valley area.

The new facility would transform voltage from 138 kV to 69 kV/22.8 kV and would provide facilities to allow switching among primary transmission lines. The fenced substation yard would contain 138 kV, 69 kV/22.8 kV, and 12.47 circuit breakers; air break switches; one 138 kV to 69 kV/22.8 kV power transformer with oil containment facilities; bussing; steel structures; foundations; and a grounding system. A control building would also be installed to house protective relaying devices.

2.1.4.3 69 kV/22.8 kV Transmission Line

A new 69 kV/22.8 kV overhead transmission line would be constructed from LCPD's proposed Emrys Jones Substation to each LCWD proposed well site for a total maximum distance of 14.0 miles. The 69 kV/22.8 kV transmission line would be a single-circuit line supported by wood pole structures. Angle and dead end structures may be guyed wood poles or galvanized steel structures as determined by site-specific engineering. The 69 kV/22.8 kV transmission line would primarily be located on public lands managed by the BLM, with a short section near the Emrys Jones Substation located on private property. Pole heights would vary depending on terrain and would range between 50 feet and 70 feet. Each structure would require a temporary construction easement of 0.07 acre (60 feet by 50 feet). After construction, each structure would occupy 0.02 acre (30 feet by 30 feet).

2.1.4.4 Typical Well Substation

To serve the well field, up to seven new substations, each approximately 115 feet by 95 feet would be constructed adjacent to each well. These substations would be served by the planned 69 kV/22.8 kV circuit on the transmission line. The fenced substation yards would consist of a 69 kV/22.8 kV to 4.16 kV pad-mounted step-down transformer, primary metering, switch cabinet, capacitor bank, and a station service transformer.

2.1.5 Fiber Optic

The Lincoln County Telephone Company is proposing to install fiber optic cables within the Proposed Action ROW. The fiber optic line would be buried in the same trench as the pipeline on public lands and adjacent to the 138 kV transmission line on private lands. The fiber optic cables would be used for communication to manage the pipeline operation. The fiber optic cables would tie into an existing fiber optic line located on the east side of Highway 93.

2.1.6 Additional Project Components

Extra Work Spaces – Approximately 50 acres may be used for temporary extra work spaces. These areas would be spaced approximately 0.5 mile apart and would cover approximately 2 acres. Some larger staging areas may be sited in suitable areas near steeply incised drainages, above and below slopes where construction is expected to be difficult, and at pipe laydown areas. All extra work spaces on federal lands would be located within the permitted ROW. Staging areas on private lands would be used during construction for storage of materials and equipment, construction office trailers, fuel storage, equipment maintenance, stockpiling and handling of excavated material, and other construction-related activities. Following construction, the staging areas would be restored as described in the KSV Groundwater Development Project EIS.

Fire Hydrant – In 2005, a wildfire burned approximately 8 acres within and near the northeastern third of the project area. The severity of wildfires in eastern Nevada has increased in recent years as a result of land use practices (e.g., livestock grazing and fire suppression), weather changes, and the spread of non-native grasses. LCWD would provide a fire hydrant within the locked enclosure at KPW-1/forebay site and a key(s) would be provided to BLM's designated representative for access and use of the hydrant for fire suppression. During construction, all federal, state, and county laws, ordinances, rules, and regulations that pertain to prevention, pre-suppression, and suppression of fires would be strictly followed. All construction personnel would be advised of their responsibilities under the applicable fire laws and regulations.

2.1.7 Road Access and Transportation

Highway 93 and Kane Springs Valley Road would provide primary access into the project area. Spur roads would be constructed from Kane Springs Valley Road to temporary and permanent facilities sites, such as contractor's yards, well fields, and power pole locations, within the permitted ROW corridor. The number of new spur roads would be held to a minimum, consistent with their intended use (e.g., facility construction, conductor stringing and tensioning). The existing Kane Springs Road will serve as the main access road. It is estimated that 7 new minor access roads would be required to access the proposed well houses (**Figure 1**). These well locations are approximate and may change. Each of these roads would be approximately 100 feet

long and 12 feet wide. New access roads will not have berms installed since they will be crowned to drain properly. New roads would be constructed only where existing access roads do not exist; otherwise, existing access roads would be used or improved.

Where construction of access roads is needed, they would typically be 12 feet wide and constructed in accordance with BLM and Lincoln County roadway standards and specifications. Some temporary access roads may cross Kane Springs Wash or other ephemeral washes in the project area. Specific crossing and erosion control measures are provided in the Storm Water Pollution Prevention Plan (SWPPP) prepared for the Proposed Action. Measures to minimize adverse impacts on washes and drainages during construction and operation are described in the Standard Construction and Operation Procedures Checklist in the KSV Groundwater Development Project EIS**.**

Access roads not required after construction would be removed and restored to their approximate original contour and dimensions and made to discourage vehicular traffic. All temporary road surfaces would be ripped or harrowed to establish conditions appropriate for reseeding, drainage, and erosion prevention. Permanent access roads would typically be 12 feet wide, graded to prevent slumping or washing, and graveled to provide year-round access.

2.1.8 Construction Phasing

Construction of the Proposed Action would occur in three phases, with 1 to 3 years between phases. Phases would correspond to demand for water and issuance of permits for additional water rights. The Nevada State Engineer has granted an appropriation of 1,000 acre-feet per year (AFY) to the LCWD for groundwater withdrawal from the carbonate aquifer within the KSV Hydrographic Basin. This appropriation granted four points of diversion, which constitutes the initial production under Phase 1 of the Proposed Action. If additional appropriations are granted, production from Phase 1 wells could be increased, and Phase 2 and Phase 3 wells could be developed.

PHASE 1: Construction of Phase 1 would occur over a 90- to 180-day period and would begin upon completion of the NEPA process and acquisition of necessary permits and approvals. The groundwater production facilities, groundwater collection and transmission pipelines, electric transmission and distribution system, and fiber optic line would be constructed at the same time.

Water Facilities

- Pipelines: 3.8 miles of transmission pipeline (main water line) and approximately 9.4 miles of well field collection pipelines for up to four wells (main collection plus laterals to wells)
- Wells: up to four production wells
- Storage Tanks: one 50,000-gallon forebay storage tank on public land and one 700,000-gallon terminal storage tank on private land

Power Facilities

- Power Lines: approximately 2.7 miles of 138 kV overhead power lines located on

private land and 14 miles of 69 kV/22.8 kV overhead power lines located primarily on public land

- Electrical Substations: Emrys Jones Substation located on private land and up to four smaller substations to serve each well
- Ancillary Facilities: access roads, temporary workspace, and a storage yard located on private land

Ancillary Project Components

- Fiber optic line
- Monitoring Wells: Nine existing monitoring wells are currently being used to monitor groundwater conditions in the area. Additionally, up to two new monitoring wells would be constructed per the Stipulated Agreement.
- Extra Work Space: up to 50 acres total; each work space would be approximately 2 acres in size and would be spaced approximately 0.5 mile apart
- Fire hydrant; to be sited adjacent to the forebay tank

PHASE 2: Construction would occur over a 30- to 60-day period and would begin 1 to 3 years after the completion of Phase 1.

Water Facilities

- Pipelines: one to two lateral pipelines from Phase 2 wells to the main collection pipeline (combined length of the two lateral pipelines is expected to be less than 1 mile)
- Wells: one to two production wells

Power Facilities

- Power Lines: 22.8 kV underground power lines from main transmission line to substation(s)
- Electrical Substations: One to two smaller substations to serve the new well(s)
- Ancillary Facilities: access roads to substations

PHASE 3: Construction would occur over a 30- to 60-day period and would begin 1 to 3 years after the completion of Phase 2. Phase 3 would only be developed if production from Phase 1 and Phase 2 were insufficient to meet anticipated demand or if production from previous wells were lower than estimated or designed.

Water Facilities

- Pipelines: one to two lateral pipelines from Phase 3 wells to the main collection pipeline (combined length of the two lateral pipelines is expected to be less than 1 mile)

- Wells: one to two production wells

Power Facilities

- Power Lines: 22.8kV underground power lines from main transmission line to substation(s)
- Electrical Substations: One to two smaller substations to serve the new well(s)
- Ancillary Facilities: access roads to substations

The proposed ROWs would range between 100 to 150 feet wide, including both permanent and temporary easements, based on pipeline size, land use, and topographic constraints. In general, the pipeline would parallel Kane Springs Valley Road within a 60-foot wide construction easement and a 30-foot wide permanent easement. If cross-country construction is required, the temporary construction easement for the pipeline would be 75 feet, with a permanent easement of 60 feet.

The electric transmission lines would typically parallel the water transmission pipeline and share the pipeline's temporary construction easement. In areas of cross-country travel, the electric transmission lines would be constructed within a 100-foot wide construction easement. Additional temporary work areas may be required in areas of rough or steep terrain, wash crossings, and any areas identified as containing sensitive environmental resources. The fiber optic line would be buried in the same trench as the pipeline on public lands and adjacent to the 138 kV transmission line on private lands. After construction, the electric transmission lines would require a 100-foot wide permanent easement.

Table 2-1 lists estimated temporary and permanent disturbance acreage required for construction and operation of the Proposed Action. The estimated disturbance acreage is based on preliminary engineering plans. The disturbance acreage is likely to change based on refinement of the project layout and design; however, all construction and operations activities would occur within the permitted ROW.

Table 2-1
Estimated Surface Disturbance by Land Ownership
(at full buildout of the Proposed Action)

	Temporary (acres)*	Permanent (acres)*
Federal (BLM)		
Well House and Well Substation	3.2	3.0
KPW-1 Well, Forebay Tank, KMW-1 Well	0.3	1.0
Pipeline Construction ROW	148.7	0.0
Terminal Storage Tank	0.0	0.0
Electrical Substation	0.0	0.0
Electrical Transmission Line	14.8	5.0
Electrical Transmission Line Access Roads	0.0	8.0
Fiber Optics Line	0.0	0.0
Subtotal	**167.0**	**17.0**
Private		

Table 2-1
Estimated Surface Disturbance by Land Ownership
(at full buildout of the Proposed Action)

	Temporary (acres)*	Permanent (acres)*
Well House and Well Substation	0.0	0.0
KPW-1 Well, Forebay Tank, KMW-1 Well	0.0	0.0
Pipeline Construction ROW	0.0	0.0
Terminal Storage Tank	0.7	0.3
Electrical Substation	2.0	3.4
Electrical Transmission Line	7.1	1.6
Electrical Transmission Line Access Roads	0.0	0.7
Fiber Optics Line	14.2	0.0
Two Groundwater Monitoring Wells	4.0	2.0
Subtotal	**28.0**	**8.0**
Total	**195.0**	**25.0**

* Temporarily disturbed areas are those that would be reclaimed and revegetated following construction. Permanently disturbed areas are those that would be impacted for the life of the project by a facility footprint (e.g., well house, substation, access road, etc.).
BLM – Bureau of Land Management

2.1.9 Construction Procedures

Phase 1 is estimated to create up to 160 temporary jobs and would take 90 to 180 days to complete. It is anticipated that local workers from Lincoln County and northern Clark County would fill the majority of open construction jobs. Labor trades anticipated to be required during construction include electricians, heavy equipment operators, and other skilled construction laborers. Construction equipment would include light- and heavy-duty trucks, graders, dozers, backhoes, trenchers, manlifts, front-end loaders, water trucks, and water pumps.

Each utility agency would conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW. Standard construction techniques would be used to construct the project facilities. In addition to standard construction methods, LCWD, LCPD, and the Lincoln County Telephone Company would use special construction techniques where warranted by site-specific conditions. These special techniques would be used when constructing across dry washes and Highway 93. All construction, operation, and maintenance activities would be conducted in strict conformity with all applicable federal, state, and local laws and regulations. Each utility agency would assign a designated construction contractor whose responsibilities would include ensuring that project activities are compliant with all applicable laws and regulations. The contractor(s) would be required at all times to take all reasonable precautions for the safety of project employees and of the public, and would comply with all applicable provisions of federal, state, and municipal safety laws and building and construction codes, as well as the safety rules and regulations of the utility agency.

Construction activities for each utility agency would generally follow a sequential set of activities performed by a number of small crews proceeding along the length of the ROW. Construction activities, including construction of temporary and permanent access roads, would

be coordinated among the various utility agencies sharing the permitted ROW. To supply electrical power to the well fields, it is anticipated that LCPD would be the first utility agency to begin construction after all approvals have been acquired.

Construction of the electric transmission lines would involve the following sequence:

- Engineering surveys and staking;
- Clearing and grading for access road construction;
- Wire handling areas and laydown sites;
- Material storage and handling;
- Structure holes;
- Structure assembly and erection;
- Conductor and shield wire stringing;
- Post construction cleanup and reclamation; and
- Construction monitoring.

Construction of the substations would involve the following sequence:

- Engineering surveys and staking;
- Clearing and grading for access road construction and site grading;
- Material storage and handling;
- Pour concrete foundations and ground grid;
- Install below-grade raceway channel for electrical wires;
- Install equipment, structural steel, and bus;
- Install above-grade raceway channel for electrical wires;
- Construct control building;
- Install low voltage wiring;
- Install security fencing;
- Yard surfacing;
- Equipment testing;
- Post-construction cleanup and reclamation; and
- Construction monitoring.

Construction of the groundwater facilities and fiber optic line would involve the following sequence:

- Engineering surveys and staking;
- Topsoil salvage and storage;

- Clearing and grading (including access road construction);
- Trenching and blasting;
- Pipeline stringing/installation;
- Installation of fiber optic line in common pipeline trench;
- Backfilling;
- Hydrostatic testing;
- Regrading, post-construction cleanup, and reclamation; and
- Construction monitoring.

2.1.9.1 General Construction Procedures

Before starting construction, the final project design would be coordinated among the utility agencies and the BLM. Each utility agency would be required to submit a final Plan of Development (POD) to the BLM prior to the issuance of the BLM Notice to Proceed (Form 2800-15). Each utility agency would be required to comply with the approved POD and any stipulations attached to the ROW. The following subsection describes the general sequence of construction activities for the groundwater, electric utilities, and fiber optic lines. During construction activities, water will be used to suppress dust in the construction area.

2.1.9.2 Survey and Staking

The first step of construction would involve marking the limits of the approved work area (i.e., the construction ROW boundaries, additional temporary workspace areas) and flagging the locations of approved roads and environmentally sensitive areas. Before the pipeline is trenched and excavated, a survey crew would stake the centerline of the proposed trench. Survey activities for construction of the electric system would be concurrent with pipeline construction. LCPD's survey and staking activities would consist of identifying boundaries of the LCPD ROW, pole structure locations, substation locations, access road locations, and temporary work area locations.

2.1.9.3 Topsoil Salvage and Storage

Topsoil handling would be conducted to salvage, store, protect, and redistribute the highest quality soils suitable for revegetation and for maintenance of surface color. Topsoil stripping width, depth, and storage are expected to vary along the pipeline route depending on criteria such as: potential safety hazards, construction techniques, land use, soil characteristics, grading requirements, slope, the amount of traffic expected over a particular construction segment, vegetation, and methods for crossing dry washes and roads.

2.1.9.4 Clearing and Grading

Before clearing and grading activities are conducted, fences would be braced and cut, and temporary gates and fences would be installed to contain livestock, if present. Grading would be conducted where necessary to provide a reasonably level work surface. Where the ground is relatively flat and does not require grading, rootstock would be left in the ground. More

extensive grading would be required in steep side-slopes or vertical areas and where necessary to prevent excessive bending of the pipeline.

To the extent practicable, native shrubs and other vegetation would be preserved and protected during construction operations. In all cases, clearing would be restricted to only those areas that require clearing or grading for construction activities. The pipeline centerline and margins would be staked and flagged to identify permitted ROW boundaries.

2.1.9.5 Trenching and Blasting

Trenching would consist of excavating the trench using either a trenching machine or track-mounted excavator. A conventional excavator would be used wherever a deeper and wider than normal trench is required such as at tie-in locations, access manways, fiber optic slice vaults, hydrostatic test manifold sites, and pipeline valve locations. Unless land uses and permits dictate a greater width, the bottom of the trench would generally be 60 inches wide and sufficiently deep (up to 6 feet) to provide the required cover over the top of the installed pipe. In areas of weathered rock, track-mounted excavators may be preceded by a bulldozer equipped with a single-shank ripper. Limited blasting may be required in areas where shallow or exposed bedrock is present. If blasting were required, strict safety precautions would be followed, including compliance with federal, state, and local codes and ordinances and manufacturer's prescribed safety procedures and industry practices.

Trenching activities would be conducted in a manner that reduces impacts on wildlife. Temporary wildlife barrier fencing would be installed as necessary at any point where the soil is ramped from the trench bottom to the surface. Fencing would be installed to make access into the trench difficult, but in such a manner that animals trapped within the trench could use the soil ramp to escape. Dirt ramps and/or trench spurs would be constructed at an angle of less than 45 degrees to the horizontal to allow for the escape of wildlife if they fell into the trench.

It is anticipated that this project would be constructed utilizing a "Dig and Lay" procedure where the working face is the only open trench. In other words, a portion of trench would be dug, the pipe would be laid, welded, and back filled and another segment would begin. There would be minimal (less than 500 feet) open trench at any one time and the backfill would occur almost immediately following pipe installation.

2.1.9.6 Construction of the Electric Utility Facilities

Construction of the overhead lines would be completed in two phases: setting the pole structures and installing the cable. The setting of the pole structures is accomplished with a single multi-purpose truck. The truck has a small crane suitable for lifting and placing poles. A pole trailer is towed behind the crane truck to transport the poles to the installation site. Affixed to the crane is an auger for boring the holes for the pole structures. Soil excavated during construction would be used for backfill and for restoration of disturbed areas.

The cable would be installed using two vehicles: a cable truck and a truck with a power lift. The cable would be strung out along the installation route and the man lift would be used to place the cable on the pole structure. Overhead lines would be designed to Avian Power Line Interaction Committee (APLIC) specifications to minimize raptor electrocution risk.

Construction of each substation would involve site grading, installing gravel material within the fenced area of the substation, constructing concrete foundations for the transformers and other components within the substation, installing substation equipment, and erecting a chain-link security fence around the substation perimeter. The area would be secured and limited to authorized personnel during construction and operation.

All components of the electric utility facilities would be designed in accordance with the requirements of the latest edition of the National Electric Safety Code, the latest edition of the National Electrical Code, and the standards of the Rural Utility Service of the U.S. Department of Agriculture.

2.1.9.7 Installation of Groundwater Pipeline and Fiber Optic Line

Pipe stringing involves trucking the pipe into position along the staked construction ROW in preparation for installation. The pipe would be staged adjacent to the trench and spaced so that it is easily accessible to construction personnel. Sufficient pipe necessary for dry wash or road crossings would be stockpiled at extra work space areas in the vicinity of each crossing. The rate of pipeline installation would vary depending on installation method and local site conditions and can range from 140 to 600 feet per day.

Before the pipeline is lowered in, the trench would be inspected to make sure it was free of wildlife that may be trapped in the trench, as well as rocks and other debris that could damage the pipe or protective coating. Side-boom tractors and/or track-mounted excavators would be used to lower the pipe into the excavated trench. If the bottom of the trench is located in rock, pipe supports, sand, soil padding (not topsoil), or other means would be used to protect the pipe before it is lowered into the trench.

The fiber optic cable would be buried in a common trench with the pipeline. It is anticipated that a large portion of the excavated native subsoils encountered during construction would be suitable backfill material. If deemed appropriate, the excavated subsoil would be screened and used as pipe bedding material during installation. Topsoil would not be used for backfill. The use of native material would reduce the amount of imported material hauled into the area and also minimize the disposal of excavated spoils and the amount of truck traffic on access roads and along the ROW. Screened byproducts would be used in intermediate backfill or hauled off site to an approved location. Excess soils are not anticipated.

2.1.9.8 Construction of Storage Tanks

Construction of the forebay storage tank (on public lands) and the terminal storage tank (on private lands), would follow a standard sequence of activities: clearing and grading, installing the proposed facilities, and erecting the appropriate structures and components. Construction activities and the storage of building materials would be confined to the designated work areas within the permitted ROW.

2.1.9.9 Hydrostatic Testing

Hydrostatic testing would be conducted to verify the integrity of the pipeline. Pipeline integrity is tested by capping pipeline segments with test manifolds, filling the capped segments with

pressurized water, and holding for at least 4 hours. Any significant loss of pressure indicates a potential leak and may require further inspection. The pipeline trench would be completely filled in prior to hydrostatic testing as described in **Section 2.1.9.5 *Trenching and Blasting***.

Approximately 500,000 gallons of water would be required for testing the entire water transmission pipeline. Prior to filling the pipeline with water, a sizing plate and cup pigs would be pushed with air through the proposed test segment to ensure that no abnormalities or dents are present along the pipeline. The volume of water used to test each pipeline segment would be pushed by air through the pipeline to each successive pipeline segment.

A temporary discharge permit for the hydrostatic testing would be obtained from the Nevada Division of Environmental Protection (NDEP) Bureau of Water Pollution Control, and permit controls regarding erosion control would be implemented. The primary source of water for hydrostatic testing would be from the production well. Test water would be transferred between pipeline segments where possible to minimize the amount of water required. Excess water would be discharged into natural drainage areas around each site. A diffuser, rock rip-rap, or other erosion control feature would be used to reduce discharge rates to prevent scouring. The discharged water is not anticipated to extend more than 500 feet from the discharge site because it would rapidly evaporate or percolate into the alluvial sediment in the area. No long-term ponding of water would occur.

2.1.9.10 Re-grading and Post Construction Cleanup

Following backfill, areas within the ROW disturbed by construction operations would be re-graded where necessary to the approximate original contour with allowance for settling, particularly over the trench. The contractor would check for surficial compaction at areas occupied by equipment during construction (e.g., the working side of the ROW or staging areas). Compacted soils would be either ripped or harrowed.

Reclamation would include recontouring of impacted areas to match the surrounding terrain, cleaning trash out of gullies, and restoring terraces. Any remaining natural debris or rocks that have not been intentionally left on the ROW would be disposed of in an appropriate manner. After final cleanup, the BLM would be contacted to verify that post-construction commitments for the ROW and other component sites are satisfied.

The contractor(s) would be required to employ a continuous cleanup program throughout construction. Restoration would include the removal of deep ruts and the disposal of foreign objects such as slash, chunks of concrete, pile cut-off, and construction materials. Waste materials and debris from construction areas would be collected, hauled away, or disposed of at approved landfill sites.

2.1.9.11 Topsoil Redistribution

Soil stabilization measures would be initiated as soon as practicable after construction ceases. Topsoil would be evenly distributed across areas where it was salvaged and seeded with native, drought-tolerant species of plant as directed by the BLM. The contractor(s) would be responsible for replacement of lost or degraded (mixed) topsoil with topsoil imported from a weed-free source approved by the BLM.

2.1.10 Operation and Maintenance

Water facilities would be operated and maintained in accordance with standard procedures to ensure safe operation and integrity of the pipeline. The operation and maintenance of the pipeline would be performed by qualified and trained employees. Personnel would be capable of monitoring the operating conditions as well as controlling flows and pressures through the pipeline.

The pipeline and associated groundwater components would be inspected regularly to identify potential pipeline breaks or leaks. Any large break would be immediately identified through an accounting process that compares delivery amounts to the pumped amount. Based on this accounting process, breaks would be identified and isolated in as little as 8 hours. The typical method to minimize damage to soils would be to shut down the pumps as soon as possible, then close the nearest isolation valves on the upstream side of the break. The nearest downstream isolation valve would be closed if the break occurred in a low point where flow could come from both directions.

The environmental consequences of a break would be soil erosion from the location of the break to the surrounding drainage area. Typically, the path of least resistance would be along the existing pipeline trench; however, it is possible that areas between the trench and the drainage area could be affected. If a pipeline break were to occur, the LCWD or its contractor would take immediate action to isolate the break. Following isolation, the break would be repaired, and the immediate trench area backfilled and compacted to support the pipe so that normal operations could resume as soon as possible.

Prior to site reclamation, BLM would be notified of the break to allow inspection of the site. Following consultation with the BLM, all areas would be filled, contoured, and revegetated to as close to the previous state as possible.

After the electric utility system has been energized, the electrical facilities would be in virtually continuous operation. Periodic inspection and maintenance of the transmission line and substation facilities are required to maintain safe and reliable operation. The electrical equipment and wood poles are anticipated to have a lifetime of approximately 50 to 60 years or more depending on the maintenance operations and climatic conditions. Emergency maintenance, such as repairing downed wires during storms and correcting unexpected outages, would be performed by LCPD.

2.1.11 Abandonment

Should operation of the groundwater facilities cease, the aboveground structures and equipment would be removed and salvaged to the extent feasible and, in most cases, the pipelines would be purged, capped, and abandoned in place. Any areas disturbed during abandonment would be revegetated and restored in accordance with BLM requirements in effect at the time.

The electric utility facilities would become a permanent portion of LCPD's utility system. Facilities are planned for a 50- to 60-year life with anticipated indefinite extension enabled by repair and replacement of equipment and material. Voluntary abandonment of the groundwater or electric facilities is not anticipated.

3.0 AFFECTED ENVIRONMENT

3.1 VEGETATION

The project area is located in the Mojave Desert biome. Vegetation communities within the Mojave Desert biome that are represented in the project area can be characterized as Mojave Creosote Bush Scrub and Mojave Desert Wash Scrub. Mojave Creosote Bush Scrub communities dominate in areas lower than 4,000 feet in elevation. Mojave Desert Wash Scrub habitat is restricted to sandy arroyos and washes at elevations below 5,000 feet.

3.1.1 Mojave Creosote Bush Scrub

This vegetation class includes Mojave mixed scrub and creosote-bursage vegetation that is characterized by 3- to 9-foot tall shrubs that are widely spaced and usually with bare ground between them. Dominant and associate species within this vegetation community are listed in **Table 3-1**.

Table 3-1
Dominant and Associate Plant Species in the Mojave Creosote Bush Scrub Vegetation Community

Common Name	Scientific Name
Dominant Species	
Creosote bush	*Larrea tridentata*
Desert thorn	*Lycium* spp.
Shadscale	*Atriplex confertifolia*
Hopsage	*Grayia spinosa*
Blackbrush	*Coleogyne ramosissima*
White brittlebush	*Encelia farinosa*
Bursage	*Ambrosia dumosa*
Desert saltbush	*Atriplex polycarpa*
Associate Species	
Joshua tree	*Yucca brevifolia*
Mojave yucca	*Yucca schidigera*
Mormon tea	*Ephedra nevadensis*
Range ratany	*Krameria parvifolia*
Desert trumpet	*Eriogonum inflatum*
Big galleta	*Pleuraphis rigida*
Indian ricegrass	*Achnatherum hymenoides*

This community exhibits a higher susceptibility to wildfires of increased size compared to other communities in years following high amounts of rainfall. This increased susceptibility is potentially related to the presence of abundant non-native grasses that provide a continuous fuelbed in years following high rainfall (Brooks and Matchett 2006). Additionally, the severity of wildfires in eastern Nevada has increased in recent years as a result of changes in land use practices (e.g., livestock grazing and fire suppression) and human-caused climate change (BLM 2000). In 2005, a wildfire burned approximately 8 acres within and near the northeastern third of

the project area. The disturbance caused by fire has allowed for an increased presence of non-native grassland, which is now a dominant component within that portion of the project area. This non-native grassland provides a more continuous fuel load than that in adjacent unburned areas. Overall, the change from native vegetation (e.g., shrubs interspersed with grasses) to a non-native grassland increases susceptibility of the area to future wildfires.

3.1.2 Mojave Desert Wash Scrub

The Mojave Desert Wash Scrub community consists of low, scrubby vegetation, the occurrence of which is restricted to the borders of Kane Springs Wash and other sandy arroyos. Dominant species of this community within the project area include creosote bush, Mormon tea, and indigo bush (*Psorothamnus fremontii*); desert willow (*Chilopsis linearis*) and cat claw (*Acacia greggii*) are less common components of this community and are sparse in the project area. Other species that occur in this community type in the project area include desert broom (*Baccharis sarathroides*) and big galleta (*Pleuraphis rigida*). Much of the surface area within this community is bare ground (ARCADIS 2006a).

3.2 WILDLIFE

A wide variety of wildlife resources typical of the Mojave Desert ecological systems is present in the project area. Fish are absent from the project area because of the lack of suitable aquatic environments. The vegetation types or communities that comprise the wildlife habitat in the project area include Mojave Creosote Bush Scrub and Mojave Desert Scrub. Surface water sources potentially available to wildlife include isolated springs, stock ponds, and wildlife water developments. Eight big game and 47 small game wildlife water developments are located within 10 miles of the project area. The big game wildlife water developments are located in the Delamar Mountains and in the Meadow Valley Mountains. The 47 small game wildlife water developments are located predominantly within the Kane Springs Valley and the Coyote Spring Valley (Stevenson 2006).

The Region of Influence (ROI) for wildlife resources, including Threatened, Endangered, and Candidate wildlife species, consists of areas that will be affected by permanent and temporary Proposed Action or Alternative 1 features and also those areas where groundwater withdrawal may have an impact on surface waters. The extent of the ROI for wildlife resources is based on the affects on surface waters using the analysis within the Kane Springs Valley Groundwater Development Project Environmental Impact Statement. The ROI for wildlife resources includes those areas in the immediate vicinity of Proposed Action construction, operations and maintenance activities, as well as the Muddy Springs system, which is approximately 28 miles south of the project area since this area may be impacted by groundwater withdrawals.

3.2.1 Mammals

Several carnivores occupy the various habitats that occur throughout or near the project area. Bobcat (*Lynx rufus*), coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargentus*), and badger (*Taxidea taxus*) may be encountered in suitable habitats throughout the project area. The mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), and Nelson (Desert) bighorn sheep (*Ovis canadensis nelsoni*) utilize all of the mountain ranges

around the project area and most likely use or traverse the project area. Various other mammals also inhabit the project area. Typical species include black-tailed jackrabbit (*Lepus californicus*), desert cottontail rabbit (*Sylvilagus audobonii*), desert wood rat (*Neotoma lepida*), rock squirrel (*Spermophilus variegatus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), round-tailed ground squirrel (*Spermophilus tereticaudus*), pocket gopher (*Thomomys bottae*), Merriam's kangaroo rat (*Dipodomys merriamii*), various cricetid mice (*Onychomys* sp., *Reithrodontomys megalotis, Peromyscus sp.*), pocket mice (*Perognathus* sp., *Chaetodipus* sp.), ringtail (*Bassariscus astutus*), and spotted skunk (*Spilogale gracilus*).

A variety of bat species, such as the western pipistrelle (*Pipistrellus hesperus*), several species of myotis (*Myotis* sp.), and others, make use of the project area either as foraging residents or migrants. Roosting habitat varies among species, but typically is characterized by steep rocky outcrops with crevices, caves, abandoned mines, or large trees. Bat surveys conducted in the vicinity of the project area in 2003 in the Meadow Valley Wash (E 708165 N 4082710), Kane Springs Wash (E 702806 N 4165896), and Meadow Valley Range (E 691919 N 4087617) identified 11 species of bat. The California myotis (*Myotis californicus*), fringed myotis (*Myotis thysanodes*), western pipistrelle, pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), long-legged myotis (*Myotis volans*), small-footed myotis (*Myotis ciliolabrum*), big brown bat (*Eptesicus fuscus*), western red bat (*Lasiurus blossevilli*), Yuma myotis (*Myotis yumanensis*), and Brazilian free-tailed bat (*Tadarida brasiliensis*) were detected during these surveys (Kenney and Tomlinson 2005).

3.2.2 Birds

The project area potentially provides suitable nesting habitat for the burrowing owl (*Athene cunicularia*). Other raptors may regularly utilize the project area to forage. Raptors likely to use the area include golden eagles (*Aquila chrysaetos*), red-tailed hawks (*Buteo jamaicensis*), American kestrels (*Falco sparverius*), prairie falcons (*Falco mexicanus*), barn owls (*Tyto alba*), burrowing owls, and great-horned owls (*Bubo virginianus*) (Peterson 1990). Additional avian species which may occur in or near the project area include black-chinned sparrow (*Amphispiza bilineata*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), greater roadrunner (*Geococcyx californianus*), mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii*), loggerhead shrike (*Lanius ludovicianus*), canyon wren (*Catherpes mexicanus*), rock wren (*Salpinctes obsoletus*), phainopepla (*Phainopepla nitens*), ash-throated flycatcher (*Myiarchus cinerascens*), lesser nighthawk (*Chordeiles acutipennis*), common poorwill (*Phalaenoptilus nuttallii*), black-tailed gnatcatcher (*Polioptila melanura*), verdin (*Auriparus flaviceps*), white-throated swift (*Aeronautes saxatalis*), black-chinned hummingbird (*Archilochus alexandri*), ladder-backed woodpecker (*Picoides scalaris*), Scott's oriole (*Icterus parisorum*), and western kingbird (*Tyrannus verticalis*).

3.2.3 Amphibians

Amphibian species potentially occurring in or near the project area include the Great Basin spadefoot (*Spea intermontana*), western toad (*Bufo boreas*), red-spotted toad (*Bufo punctatus*), and Great Plains toad (*Bufo cognatus*). These highly desert-adapted species occur throughout the region. The somewhat less desert-adapted Woodhouse's toad (*Bufo woodhousei*) and bullfrog (*Rana catesbeiana*) might also be expected within moist areas (Stebbins 2003).

3.2.4 Reptiles

In addition to the desert tortoise, a wide variety of reptile species is likely to occur in the region of the project area. Southern Nevada deserts support at least 16 lizard species, many of which may occupy the project area. These include the side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus* [=*Aspidosceles*] *tigris*), zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), desert iguana (*Dipsosaurus dorsalis*), chuckwalla (*Sauromalus* (*obesus*) *ater*), long-nosed leopard lizard (*Gambelia wislizenii*), Great Basin collared lizard (*Crotaphytus bicinctores*), western banded gecko (*Coleonyx variegatus*), desert spiny lizard (*Sceloporus magister*), and Gila monster (*Heloderma suspectum).*

Eighteen snake species occur locally and, as with the lizards, several may be found in the project area. These include the western blind snake (*Leptotyphlops humilis*), ground snake (*Sonora semiannulata*), spotted leaf-nose snake (*Phyllorhynchus decurtatus*), coachwhip (*Masticophis flagellum*), patch-nosed snake (*Salvadora hexalepis*), gopher snake (*Pituophis catenifer*), glossy snake (*Arizona elegans*), long-nosed snake (*Rhinocheilus lecontei*), common kingsnake (*Lampropeltis getula*), night snake (*Hypsiglena torquata*), lyre snake (*Trimorphodon biscutatus*), southwestern black-headed snake (*Tantilla hobartsmithi*), sidewinder or horned rattlesnake (*Crotalus cerastes*), Mojave rattlesnake (*C. scutulatus*), and speckled rattlesnake (*C. mitchellii*) (Stebbins 2003).

3.3 WATER RESOURCES

Water resources are analyzed within this document in order to determine the Region of Influence of the Proposed Action. The depth to groundwater in the project area is more than 900 feet below ground surface (URS 2006). As such, surface-disturbing activities associated with construction are not expected to directly impact groundwater in the project area.

No direct or indirect impacts to surface water resources related to groundwater pumping are anticipated under the Proposed Action. In situations where pumped groundwater is connected to surface water, surface water quantity or quality from groundwater pumping could be affected. However, no such connection occurs in the KSV Hydrographic Basin, as the water to be withdrawn is located from the deep carbonate aquifer and is not hydraulically connected to surface water in the KSV. Therefore, no impacts are anticipated to surface waters including Meadow Valley Wash, the Pahranagat Valley, and the Virgin River.

Based on previous isotope studies conducted in the regional area, local springs in the KSV basin are recharged by local precipitation and represent localized groundwater flowing through the surrounding upland areas such as Delamar Mountains and Meadow Valley Mountains. These local springs do not appear to be connected to the regional carbonate aquifer, therefore no impacts from groundwater withdrawals are anticipated under the Proposed Action.

Groundwater pumping associated with the proposed action is also not anticipated to have an effect on surface water resources within the Muddy River System. Based on available water level data, a break in the regional hydraulic gradient has been observed at the location of the Kane Springs Wash fault zone with a steeper gradient north, and a flatter gradient south of the fault zone. South of the fault zone, in Coyote Spring Valley, the Kane Springs Wash fault zone would

likely have the effect of impeding the propagation of the cone of depression migrating south towards the Muddy Springs area. Additionally, the Office of the Nevada State Engineer, in Ruling 5712, concurred that, while pumping at 1,000 AFY, "there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling would likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs. As for the effect of pumping at the higher proposed rate of 5,000 AFY from Kane Springs Valley there is insignificant evidence to judge the effects at this time." The regional flow systems and effectiveness of faults as barriers to groundwater flow in Kane Springs Valley are currently being further evaluated.

The LCWD and USFWS presented a stipulation to resolve the USFWS protest of the water withdrawal applications. Pursuant to the stipulation, the USFWS withdrew its protests and the parties requested that a Monitoring, Management, and Mitigation Plan to the Stipulation be included as part of the terms and conditions of any applications that are granted. The goal of the plan is to collectively manage the development of LCWD water rights in the Kane Springs Valley Hydrographic Basin and to avoid losses to senior water rights held by the USFWS in the Moapa Valley National Wildlife Refuge. Copies of the Stipulation for Withdrawal of Protests and the Monitoring, Management, and Mitigation Plan (Exhibit A) are included in **Appendix B**.

No impacts are expected to surface water resources in the Meadow Valley Wash or Pahranagat Valley. Any potential impacts to the Muddy River area as a result of the Proposed Action would be mitigated according to the Stipulated Agreement (**Appendix B**).

3.4 SPECIES ADDRESSED IN THIS BIOLOGICAL ASSESSMENT

A list of threatened and endangered species was obtained from the USFWS on May 11, 2006 (Williams 2006). The USFWS identified three federally listed species and one candidate species that may occur in the project area. These species include the endangered southwestern willow flycatcher and Moapa dace, the threatened desert tortoise (Mojave population), and the candidate yellow-billed cuckoo (Western U.S. Distinct Population Segment). Only habitat for the desert tortoise is identified as occurring within the project area.

During initial consultation, the USFWS requested that the southwestern willow flycatcher, Moapa dace, and yellow-billed cuckoo be considered in the KSV Groundwater Development Project EIS. As a result, these species will also be considered in this BA (**Table 3-2**). These species are associated with Meadow Valley Wash, the Virgin River, the Muddy River, and the Pahranagat Valley. Information characterizing the habitat and populations of these species is presented below.

These three species could be affected in the unlikely event that the proposed project's groundwater pumping reduces surface flows in the Meadow Valley Wash, Virgin River, Muddy River, and the Pahranagat Valley. In situations where pumped groundwater is connected to surface water, surface water quantity and/or quality from groundwater pumping could be affected. However, data presented in the EIS and discussed in the previous **Section 3.3 Water Resources**, no such connection appears to occur in the KSV Hydrographic Basin, as the water to be withdrawn is located from the deep carbonate aquifer and is not hydraulically connected to surface water.

Table 3-2
Federally Listed Species Considered

Species	Status	Habitat	Determination
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Dense riparian vegetation near surface water or saturated soil of rivers and streams at elevations less than 8,500 feet.	Preferred habitat is absent in the project area; groundwater withdrawals are not expected to impact surface waters/riparian vegetation in the ROI. Closest known breeding habitat and critical habitat is approximately 25 miles northwest of the project area in the Pahranagat Valley; Occupied breeding habitat is approximately 28 miles south of the project area at Warm Springs Ranch. Finding of "may affect, not likely to adversely affect".
Yellow-billed cuckoo (*Coccyzus americanus*)	C	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries), typically less than 6,500 feet.	Preferred habitat is absent in the project area; groundwater withdrawals are not expected to impact surface waters in the ROI. Closest known breeding occurrence is 28 miles south-southeast of the project area at Warm Springs Ranch. Finding of "would not contribute to the need to list".
Moapa dace (*Moapa coriacea*)	E	The upper reaches of the Muddy River and associated springs. Breeding habitat is restricted to tributary thermal spring outflows with temperatures form 86 to 89.6 degrees Fahrenheit.	Preferred habitat is absent in the project area; groundwater withdrawals are not expected to impact surface waters in the ROI. Occupied habitat is approximately 28 miles south of the project area in the Muddy River. Finding of "may affect, is likely to adversely affect".
Desert tortoise (*Gopherus agassizii*)	T	Occur below 3,530 feet in sandy flats, bajadas, washes, and canyons in lower elevations, to rocky foothills and caliche outcrops.	Known to occur in the project area. Finding of "may affect, is likely to adversely affect".
E = Endangered, T = Threatened, C = Candidate			

3.4.1 Southwestern Willow Flycatcher

The southwestern willow flycatcher is a federally listed Endangered bird species that is a neotropical migrant. It winters in Mexico, Central America and possibly northern South America (Sogge et al. 1997). Arizona, southern California, New Mexico, extreme southern portions of Utah and Nevada, and southwestern Texas comprise the majority of the historic and current breeding range of this subspecies. Southwestern willow flycatchers breed between early May and late August and only in dense riparian vegetation near surface water or saturated soil. Nests are generally located in thickets of shrubs or trees that are approximately 6 to 98 feet tall with dense foliage from ground level up to approximately 13 feet (USFWS 2002). The

emergency listing of the desert tortoise in 1989 was prompted, in part, by dramatic declines in some populations where Upper Respiratory Tract Disease was prevalent in desert tortoise (Berry 1997). The causative agent of Upper Respiratory Tract Disease is the bacterium *Mycoplasma agassizii*, which causes lesions in the respiratory tract (Jacobson 1994). During the last decade, this disease has continued to spread across the western Mojave Desert and elsewhere within the range of the species. Additionally, shell disease—cutaneous dyskeratosis—has also been identified in some populations (Homer et al. 1998; Homer and Berry 2001; Jacobson et al. 1994). Although little is known about the cause, epidemiology, or treatment of this shell disease, its incidence is reported to be low in the Mojave Desert.

Habitat for the southwestern willow flycatcher includes riparian areas along rivers, streams, or other wetlands with dense growth of willows (*Salix* spp.), arrowweed (*Pluchea sevicea*), and tamarisk (*Tamarix* spp.). Other common plant species associated with nesting habitat include cottonwoods (*Populus* spp.), seepwillow (*Baccharis* spp.), boxelder (*Acer negundo*), stinging nettle (*Urtica* spp.), blackberry (*Rubus* spp.), and Russian olive (*Eleagnus angustifolia*) (USFWS 2002). During migration, this species may be encountered in all but the sparsest of desert habitats.

The southwestern willow flycatcher was listed as Endangered by the USFWS on March 29, 1995. On July 22, 1997 the USFWS designated critical habitat for this species, which was subsequently rescinded by court order. On October 19, 2005, the USFWS again designated critical habitat for the species (70 Federal Register 60886; 74 miles of the Virgin River are part of this critical habitat). The critical habitat unit along the Virgin River is the closest southwestern willow flycatcher critical habitat to the project area.

Habitat for the southwestern willow flycatcher does not occur within the project area. However, habitat for this species does occur within the ROI, and breeding southwestern willow flycatchers occur at Warm Springs Ranch along the Muddy River, approximately 28 miles south of the project area (NDOW 2006). The ROI does not include any critical habitat for the southwestern willow flycatcher.

It is not anticipated that groundwater pumping in the KSV basin will reduce flows in the Muddy River Springs area. As described above, the Monitoring, Management and Mitigation Plan outlines "trigger points" that serve to minimize adverse impacts to riparian habitat in the Muddy Springs area (**Appendix B**). BLM will continue to coordinate with LCWD and USFWS to ensure that the Proposed Action would not adversely impact the Muddy River system and to mitigate potential indirect effects to the Muddy River system, including impacts to riparian flycatcher habitat. Riparian vegetation, such as that along the Muddy River system, is phreatophytic, meaning that it is deep-rooted and it absorbs water from the water table or soil above it. Slight decreases in flow are not expected to impact riparian vegetation. Therefore, the Proposed Action would not result in direct or indirect impacts to the southwestern willow flycatcher or its habitat within the Muddy River system.

As a result of the potential for indirect impacts to the Muddy River system and the associated Stipulated Agreement, a finding of "may affect, not likely to adversely affect" was found for the southwestern willow flycatcher as a result of the Proposed Action. Any potential impacts to this species and its habitat would be mitigated according to the Stipulated Agreement.

3.4.2 Yellow-billed Cuckoo

The yellow-billed cuckoo is a federal candidate for listing as threatened or endangered west of the Rocky Mountains. On July 18, 2001 the USFWS issued a 12-month finding on the petition to list the western yellow-billed cuckoo in the western continental United States. The western yellow-billed cuckoo was placed on the list of candidate species as a result of higher priorities taking precedence over its listing. This species is relatively common east of the Rocky Mountains; however, there is concern for the loss or degradation of the species' riparian habitat in the west where it is estimated that 90 percent of its habitat has been lost or degraded.

The historic breeding range of the yellow-billed cuckoo included most of North America from southern Canada to Mexico, but presently is restricted to scattered areas where suitable habitat is present. This species breeds in large blocks of riparian habitats, particularly woodlands with cottonwoods, willows, and dense understory foliage (USFWS 2001). Surveys conducted in the Muddy Springs area identified four breeding pairs of yellow-billed cuckoo at the Warm Springs Ranch, approximately 28 miles south-southeast of the project area. These pairs were found nesting in thin bands of a few cottonwoods surrounded by meadow in a stream course (USFWS 2006). Breeding habitat for this species is scarce within the project area, but breeding pairs are known from the Muddy Springs area, south of the project area.

It is not anticipated that groundwater pumping in the KSV basin will reduce flows in the Muddy River Springs area. The Stipulation discussed in **Section 3.4.1 Southwestern Willow Flycatcher** and included in **Appendix B** would offset any adverse impacts to water levels and riparian habitat within the Muddy River. BLM will continue to coordinate with LCWD and USFWS to ensure that the Proposed Action would not adversely impact the Muddy River system and to mitigate potential indirect effects to the Muddy River system, including impacts to riparian cuckoo habitat. Riparian vegetation, such as that along the Muddy River system, is phreatophytic meaning that it is deep-rooted and it absorbs water from the water table or soil above it. Slight decreases in flow are not expected to impact riparian vegetation. Therefore, the Proposed Action would not result in direct or indirect impacts to the yellow-billed cuckoo or its habitat within the Muddy River system.

As a result of the potential for impacts to the Muddy River system and the associated Stipulated Agreement, a finding of "would not contribute to the need to list" was found for the yellow-billed cuckoo as a result of the Proposed Action. Any potential impacts to this species and its habitat would be mitigated according to the Stipulated Agreement.

3.4.3 Moapa Dace

The Moapa dace is a protected species of fish listed as endangered on March 11, 1967 (32 Federal Register 4001). The Moapa dace is an endemic species of fish that is restricted to the upper reaches of the Muddy River and associated springs. A survey in 1994 indicated a population level of 3,841 individuals in 6 miles of stream habitat in five thermal headwater spring systems and the main stem of the upper Muddy River in Clark County, Nevada (USFWS 1995). A 2005 survey of the area estimated the population to be 1,296 individuals in 5.6 miles of suitable habitat in the Upper Muddy River system (USFWS 2006). The most recent survey was conducted in 2007 and the population was estimated to be 1,172 individuals (Manville 2007). Population estimates in the Upper Muddy River system between the years 1994 and 2005 have

varied from 3,841 (1994) to 907 (2003) (Manville 2007). Non-native fish and habitat alterations appear to be the primary reasons for population declines of Moapa dace (Averill-Murray 2007).

Reproduction for this species is restricted to tributary thermal spring outflows with temperatures between 86 and 89.6 degrees Fahrenheit. There is no habitat for the Moapa dace within the project area. Occupied areas of the Muddy River are approximately 28 miles south of the project area.

3.4.4 Desert Tortoise

3.4.4.1 Description

The desert tortoise is one of four species of the genus *Gopherus*, which are known collectively as gopher tortoises. The desert tortoise adult averages 9 to 15 inches in upper shell (carapace) length, with males growing larger than females. The young tortoises emerging from the nest (hatchlings) are approximately 1.5 inches long, and their shells remain soft for the first 5 to 6 years. The desert tortoise is a high-domed turtle, with elephant-like or "columnar" hind limbs. Whereas the hind limbs are elephantine, the forelimbs are more flattened with well-developed muscle used for digging burrows. Both males and females have a gular horn, an extension of the plastron (lower shell) just below the head. The gular horn is longer and often upturned in males, which use these when fighting with other males.

The range of the desert tortoise roughly approximates the distribution of the creosote bush scrub community and includes the Mojave and Sonoran deserts in southern California, southern Nevada, northwestern Arizona, the southwestern corner of Utah; and Sonora and northern Sinaloa, Mexico. There are significant morphological, genetic, ecological, and behavioral differences between desert tortoise populations in different geographical areas within its range. The species is divided into two distinct populations: the Sonoran and Mojave. The Sonoran population occurs south and east of the Colorado River in Arizona and Mexico, and the Mojave population occupies those portions of the Mojave and Colorado Deserts north and west of the Colorado River in southwestern Utah, northwestern Arizona, southern Nevada, and southern California. The latter is the population federally listed as threatened, and will be addressed in the remainder of this BA.

The desert tortoise is considered to be a "K-selected" species, meaning that it has a low birth rate, low recruitment of juveniles into the breeding population, low mortality in older age categories, and a low population turnover rate (Hohman et al. 1980). Eggs and hatchlings are quite vulnerable, and pre-productive adult mortality averages 98 percent (Wilbur and Morin 1988; Turner et al. 1987). As a result, the number of adults may remain constant for relatively long periods, during which the ratio of adults to other age groups may vary widely. Ultimately, desert tortoise longevity helps compensate for their variable reproductive success.

3.4.4.2 Species Status – Past and Present

In response to the dramatic decrease in numbers of the Mojave population of the desert tortoise throughout its entire range, the USFWS emergency-listed the species as endangered on August 4, 1989 (54 FR 32326). The Mojave population was then proposed under normal listing procedures on October 13, 1989 (54 FR 42270) and was subsequently listed as threatened on April 2, 1990 (55 FR 12178).

On March 30, 1993, the USFWS released the *Draft Recovery Plan for the Desert Tortoise (Mojave Population)* (58 FR 16691). This plan divides the range of the desert tortoise into six recovery units and recommends the establishment of 14 reserves, or Desert Wildlife Management Areas (DWMAs), ranging in size from 160 to 1,300 square miles. Using the DWMAs as the basis for areas recommended for recovery, the USFWS proposed a rule to list critical habitat for the desert tortoise on August 30, 1993 (58 FR 45748), under provisions of the Federal ESA of 1973, as amended (16 U.S.C. 1531 *et. seq.*). Following an extensive review of information and public comments, the USFWS formally designated 12 areas, encompassing a total of 6.4 million acres of critical habitat for the species in a final rule, published February 8, 1994 (59 FR 5820).

In determining areas that were appropriate to define as critical habitat for the desert tortoise, the USFWS used the following primary constituent elements:

- Sufficient space to support viable populations within each of the six recovery units (Western Mojave, Eastern Mojave, Northern Colorado and Eastern Colorado [California]; Northeastern Mojave [Nevada]; and Upper Virgin River [Utah]) and provide for movements, dispersal, and gene flow;
- Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species;
- Suitable substrates for burrowing, nesting, and overwintering;
- Burrows, caliche caves, and other shelter sites;
- Sufficient vegetation for shelter from temperature extremes and predators; and
- Habitat protected from disturbance and human-caused mortality (USFWS 1994a).

In Lincoln County, there are 244,900 acres of designated critical habitat for the desert tortoise. The Mormon Mesa Critical Habitat Unit covers approximately 427,909 acres and is composed of three Areas of Critical Environmental Concern (ACECs): Kane Springs, Coyote Spring, and Mormon Mesa (USFWS 1994a). In 2005, a wildland fire burned approximately 8 acres within the northeastern third of the project area within the Kane Springs ACEC. Desert tortoise critical habitat in or near the project area is shown on **Figure 2**.

3.4.4.3 Threats to Species Survival

According to the Desert Tortoise Recovery Plan (USFWS 1994b), the most serious problem facing the remaining desert tortoise populations in the Mojave region is the cumulative load of disease-related mortality accompanied by habitat destruction, degradation, and fragmentation as a result of urbanization, development, and increased access of humans into desert tortoise habitat. The loss of habitat, mortality from increased traffic, reduced quality and effectiveness of habitat in proximity to human presence and activity, and the additive effects from other aspects

Figure 2 Desert Tortoise Critical Habitat in or Near the Project Area

of human activity (e.g., dogs, recreation) pose a significant and increasing threat to tortoise populations within the west Mojave Desert.

The emergency listing of the desert tortoise in 1989 was prompted, in part, by dramatic declines in some populations where Upper Respiratory Tract Disease was prevalent in desert tortoise (Berry 1997). The causative agent of Upper Respiratory Tract Disease is the bacterium *Mycoplasma agassizii*, which causes lesions in the respiratory tract (Jacobson 1994). During the last decade, this disease has continued to spread across the western Mojave Desert and elsewhere within the range of the species. Additionally, shell disease—cutaneous dyskeratosis—has also been identified in some populations (Homer et al. 1998; Homer and Berry 2001; Jacobson et al. 1994). Although little is known about the cause, epidemiology, or treatment of this shell disease, its incidence is reported to be low in the Mojave Desert.

One of the most significant threats to the desert tortoise relates to the level of access to tortoise habitat afforded to people. Repeated or frequent off-road vehicle use compacts soil and damages vegetation, and individual tortoises may be run over or their burrows may be crushed. Other potentially harmful human-induced activities that exert unnatural pressure on desert tortoise populations include mineral exploration; illegal dumping of garbage; human-caused fire; handling, collecting, and harassing of tortoises; spread of invasive weeds; and trailing of livestock (Berry and Nicholson 1984).

Predation is another factor implicated in population declines of the desert tortoise. Predation by common ravens has become a major threat to desert tortoise populations in some areas. Ravens are known to prey on juvenile tortoise from 1.3 to 4.9 inches in length (Berry 1985). Between 1968 and 1992, raven populations in the Mojave Desert have increased by more than 1,000 percent due to the increase in resource subsidies (e.g., food, water, nesting substrate) that are provided by increasing human populations (Boarman and Berry 1995).

3.4.4.4 Habitat and Behavior

Adult desert tortoises in the Mojave Desert are typically active between March and October, or 5 to 7 months per year. Desert tortoises generally emerge from their burrows in mid-March to feed on annual plants. During a roughly 6-week period, these annual plants are their primary nutritional source.

Habitat requirements for the desert tortoise are somewhat variable with regard to the different regions in which it occurs. These regional differences also seem to be somewhat reflected by genetic and morphologic differences exhibited by localized tortoise populations. Desert tortoises in the eastern Mojave Desert occupy a wide variety of habitats from sea level up to 4,800 feet, from sandy flats, bajadas, washes, and canyons in lower elevations, to rocky foothills and caliche outcrops. Winter dormancy typically takes place in southern Nevada in earthen burrows dug in moderately deep to deep, well-drained soils or extensive fissures of at least 30 feet. Earthen burrows often extend from 1 to 8 feet in length and have a single, crescent-shaped opening. In the Mojave Desert, burrows are most often found under a creosote bush (59 to 77 percent of the time) or white bursage shrub (21 percent of the time). Both of these plant species are common throughout the project area.

The tortoise mating system is probably polygynous, and may be polyandrous, meaning more than one mate for each individual. Mate choice is mediated by aggressive male-male interactions and possibly by female choice (Niblick et al. 1994). Females are capable of storing sperm at least 3 to 5 years after mating. Tortoises in the west Mojave Desert exhibit pre-breeding dispersal movements ranging from 1 to 10 miles away in a single season (Sazaki et al. 1995). Desert tortoises begin reproducing at 15 to 20 years of age (Turner and Berry 1984). Clutch sizes are variable and depend on a number of factors such as the size of the female, precipitation, annual productivity of forage plants in the current and previous year, and whether it is a first clutch or not (Henen 1997; Turner et al. 1984, 1986). Average clutch size is 4.5 eggs (range 1 to 8), with up to three clutches deposited per year. Eggs are typically laid during the months of April through June in shallow depressions, usually in sandy or friable soil near the mouths of burrows.

Hatching occurs 90 to 120 days later during mid-August through October. Parental care ends with egg laying, and subsequent mortality of the eggs is high; only 2 percent of a cohort may reach sexual maturity. Sex determination in tortoises is environmentally controlled during incubation. Hatchlings develop into females when the soil temperature around the eggs is higher than 89.3°F and into males when the temperature is below that required to produce females (Spotila et al. 1994).

Tortoise activities are primarily concentrated in core areas or home ranges. Home ranges among individuals overlap without defense of specific or exclusive areas indicating territoriality. Home range size can vary from 10 to 450 acres and are influenced by an individual's sex and age, the density of the population, the season, and the availability of resources (USFWS 1994b).

In the Mojave Desert, the desert tortoise occupies various types of plant communities from sparse creosote bush desert-scrub to semi-arid grasslands. In general, desert tortoises will forage on any edible plants including spring and summer annuals, native and exotic perennial grasses, cacti flowers and fruit, and perennial shrubs. The native grasses, big galleta and Indian rice grass are often present where the desert tortoise is most abundant. Indian rice grass and big galleta are common within the project area. Insects, caterpillars, and other insect larvae also may be eaten, and desert tortoises have been observed biting road-killed anurans and lizards (Brown 1968; Okamoto 1995). Introduced plant species have greatly encroached upon native plant species in the desert tortoise's natural range, degrading the existing natural ecosystem. Desert tortoises have, however, modified their behavior to include many non- native species if present.

3.4.4.5 Distribution and Current Use in the Project Area

The Desert Tortoise Recovery Plan (USFWS 1994b) divides the range of the tortoise into six distinct population segments or recovery units. The Northeastern Mojave Recovery Unit, which covers most of southern Nevada and includes the project area, contains three critical habitat units: Coyote Spring, Mormon Mesa, and Beaver Dam Slope. The ROW crosses the Mormon Mesa critical habitat unit (**Figure 2**). In 1994, desert tortoise populations in the Mormon Mesa critical habitat unit were estimated to be between 40 and 90 adults per square mile (USFWS 1994b).

A desert tortoise survey within the project area was conducted by ARCADIS biologists between October 16 and 18, 2006. The strip-transect method was used to sample distribution and relative abundance of tortoise sign throughout the project area. Transects were 1.5 miles long by 10

meters wide and were walked in an equilateral triangle with 0.5 mile to a side. Transects were spaced at 0.5-mile intervals throughout the project area and were selected to represent the various vegetation associations, topographic features, and habitat conditions (grazed, burned, etc.). Results of the surveys show that desert tortoises are distributed relatively evenly along the proposed ROW. However, nearly all sign were inferred (burrows and water scrapes). One observation of scat, as well as one observation of shell fragments, was also noted. No live or dead tortoises were found. Tortoise densities ranged from 0 per square mile to 26 per square mile and are distributed relatively evenly across the project ROW. The highest densities were found in creosote-bursage communities near U.S. Highway 93. No evidence of desert tortoise was observed in the burned areas (ARCADIS 2006b). The survey report is included in **Appendix C**.

4.0 POTENTIAL EFFECTS

4.1 MOAPA DACE

4.1.1 HABITAT EFFECTS

Groundwater pumping associated with the Proposed Action could have the potential to impact flow rates in the Muddy River system. As a result, LCWD and USFWS have agreed to cooperatively monitor pumping of LCWD water rights in the Kane Springs Valley Hydrographic Area to avoid impairment of senior federal water rights or unreasonable adverse impacts to federal water resources (**Appendix B**). The Monitoring, Management and Mitigation plan included in the Stipulation Agreement outlines "trigger points" that serve to minimize adverse impacts to the Moapa dace (and consequently, other riparian habitat) (**Appendix B**) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. BLM will continue to coordinate with LCWD and USFWS to ensure that the Proposed Action would not adversely impact the Muddy River system.

While the Stipulated Agreement is designed to minimize adverse impacts to the Moapa dace, any decrease in flows may adversely impact the Moapa dace by decreasing pool and riffle habitat and causing a decrease in water temperature which would reduce the amount of habitat at the appropriate spawning temperature. The current flows are greater than the trigger points meaning that adverse impacts may still occur before flow rates reach the established trigger points. The Proposed Action would not result in direct impacts to the Moapa dace; however, and potential for indirect impacts associated with decreased flow levels resulting from groundwater pumping exists even though they would be mitigated using measures from the Monitoring, Management and Mitigation Plan.

4.2 DESERT TORTOISE

4.2.1 HABITAT EFFECTS

Construction of the Proposed Action would require vegetation clearing and other ground disturbance that would result in both temporary disturbance and permanent conversion of existing vegetation and habitat within the ROW. Construction and operation and maintenance (O&M) activities that could result in the temporary or permanent loss or degradation of vegetation communities include:

- Blading/grading of pipeline, water storage tank, access road, and well ROWs and material staging areas;
- Improvements to some portions of the existing access roads as well as construction of new access roads;
- Vegetation removal where needed for construction vehicle access, pipeline installation, and installation of other project features;
- Excavations resulting from pipeline construction;
- Utilization of temporary material construction staging areas;

- Soil compaction;
- Vehicle access for as-needed maintenance and emergency repairs.

The project is anticipated to have a direct effect within the Mormon Mesa Critical Habitat Unit. Direct disturbance will occur within this critical habitat unit, but it is not anticipated that any of the primary constituent elements used to determine critical habitat will be impacted in a way that would affect long-term viability of the desert tortoise population in the region. Because linear features will not be fenced, and all areas not needed for O&M activities will be revegetated, it is expected that habitat conditions and movement corridors will only be affected during the construction phase of the project. Based on the project features of the Proposed Action, preliminary temporary and permanent disturbance acreage has been calculated to estimate cumulative acreage impacts within desert tortoise habitat (**Table 4-1**).

Table 4-1
Desert Tortoise Habitat Disturbed by the Proposed Action

	Permanent Impacts (acres)	Temporary Impacts (acres)
Public Land		
Desert Tortoise Critical Habitat	13.6	133.6
Desert Tortoise Habitat (non-critical)	3.4	33.4
Private Land		
Desert Tortoise Critical Habitat	8.0	28.0
Project Total Disturbance	**25.0**	**195.0**

As shown in **Table 4-1**, approximately 25 acres of desert tortoise habitat would be permanently disturbed by construction of the Proposed Action. Approximately 195 acres would be temporarily disturbed. Of these totals, 21.6 acres (federal and private lands) of permanent disturbance would occur in the Mormon Mesa Critical Habitat Unit. Approximately 161.6 acres of temporary disturbance would occur in the Mormon Mesa Critical Habitat Unit. Permanent and temporary disturbance makes up 0.005 and 0.04 percent of the Mormon Mesa Critical Habitat Unit, respectively. Most of the critical habitat disturbance would be on land that is within the Kane Springs Valley Road ROW.

Indirect habitat effects associated with the Proposed Action include a negative impacts resulting from the increased potential for invasion of noxious and non-native weed species as well as a potential beneficial impact resulting from the installation of a fire hydrant within the project area. This fire hydrant would enable firefighters to reduce response time should a wildfire occur and would potentially aid in reducing the size of any future wildfires in the area. This could potentially prevent large-scale fires from damaging desert tortoise habitat as seen with the fires that occurred in 2005.

4.2.2 CONSTRUCTION VEHICLE TRAFFIC

Traffic generated for construction and for long-term O&M of the pipeline facilities and transmission line will increase the potential for collisions with desert tortoise.

The influx of construction personnel and transportation of material and equipment to the project area would likely increase traffic in the segment of U.S. Highway 93 between Alamo and Kane Springs Valley Road. Additionally, traffic is expected to increase along Kane Springs Valley Road as construction workers travel to and from the project area.

Given the location of the project construction ROW corridor and the proximity to areas ranging from very low to moderate desert tortoise densities, the potential exists for collisions between vehicles and migrating and active tortoise. This concern arises during both the construction and O&M phases of the project. The period of highest risk for potential vehicle collisions with the desert tortoise is between March 15 to May 31, when the tortoises are most active and, to a lesser degree, throughout the summer months (e.g., end of October).

Indirect effects associated with vehicle traffic include the increased access for recreational users within the area. However, all new access roads that are not required for O&M will be closed and revegetated, limiting the amount of new access roads in the area. Additionally, access roads will be very short spur roads off of Kane Spring Valley Road.

4.2.3 RAPTOR PREDATION

The project transmission line towers could provide artificial perches and nest sites for raptors and ravens in areas of open habitat. Habitats previously used only to hunt occasionally could become routine hunting areas because of the increased number of available perches (Ryser 1985). Design and construction of the transmission line associated with the proposed project could minimize raptor perching opportunities. Such design characteristics could include perch guards that would minimize available perching and nesting sites for raptors and ravens.

4.2.4 FRAGMENTATION

In some sensitive habitat areas, disturbance could result in fragmentation of existing vegetation communities/habitats. Fragmentation occurs whenever a large continuous habitat is transformed into smaller patches that are isolated from each other by both natural and human-induced mechanisms. The changed landscape functions as a barrier to dispersal for species associated with the original vegetation community/habitat. These smaller and more isolated habitats also support smaller populations, which are more vulnerable to local, stochastic extinction events, thereby causing smaller, more isolated habitats that ultimately contain fewer species and lower biodiversity. As more “edge” habitat becomes available due to fragmentation, the “edge-dwelling” species have the opportunity to “invade” the interior vegetation community/habitat and become a major threat to the survival of the “interior-dwelling” species. Because the project is located within an existing road ROW and permanent fencing will only be left in place around the well pads and water storage tanks, fragmentation is not anticipated beyond the existing condition as a result of the project because linear features will not be fenced.

4.3 CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the

Proposed Action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative effects can also result from spatial (geographic) and/or temporal (time) crowding of environmental impacts.

Cumulative impacts on biological resources are generally additive and proportional to the amount of ground disturbance within specific habitat areas. Both Lincoln County and the developers of the CSI development area are preparing separate Multi-Species Habitat Conservation Plans (MSHCP) that would address cumulative effects on biological resources for development and construction activities within Lincoln County and on CSI lands. These two actions are the only known actions that will occur on private lands. However, these two developments are creating MSHCPs that would address cumulative impacts associated with these actions. All other known actions in the area will occur on federal lands and will thus be subject to Section 7 consultation and are not included in this document. The Southeastern Lincoln County MSHCP and the Coyote Springs Investment MSHCP would address sensitive and protected biological resources on private and public lands in Lincoln County. In addition, the BLM and USFWS are responsible for the management of critical and sensitive habitats under their jurisdiction. Through a cooperative agreement, the federal, state, and local agencies are working to ensure conformance of any action that would affect the biological viability of the region.

4.3.1 Moapa Dace

Ongoing and future projects which could have cumulative effects on Moapa dace include other groundwater pumping projects in aquifers that are connected to the Muddy Spring area and Moapa dace habitat. As such, development activities in southern Lincoln County would be subject to the applicable MSHCP, and would require consultation with the appropriate resource management agency (e.g., BLM, USFWS, Nevada Department of Wildlife) to implement site-specific Moapa dace protection measures.

Potential cumulative impacts associated with groundwater pumping projects occurring within connected aquifers include habitat reduction and degradation. An ongoing potential exists for added incremental impacts from all projects that could have long-term effects.

4.3.2 Desert Tortoise

Ongoing and future projects which could have cumulative effects on desert tortoise include those that would be developed within desert tortoise critical habitat, which includes most of southern Lincoln County. As such, development activities in southern Lincoln County would be subject to the applicable MSHCP, and would require consultation with the appropriate resource management agency (e.g., BLM, USFWS, Nevada Department of Wildlife) to implement site-specific desert tortoise protection measures.

Potential cumulative impacts associated with projects occurring within critical habitat include habitat fragmentation and degradation, increased predation from common ravens, increased

threats of disturbance and mortality from increased human presence in the area, and an increase in fire risk in the area associated with increased human presence.

An ongoing potential exists for added incremental impacts from all projects that could have long-term effects. Increased public access potentially increases tortoise mortality resulting from shooting, collecting tortoises for pets, and running over tortoises with vehicles. Also, increased access elevates the potential for the public to release diseased tortoises into the wild.

5.0 CONSERVATION MEASURES

Although the impact of the project on desert tortoise is expected to be significant, the Applicant has proposed measures to reduce the project's impact on the tortoise.

First, the Applicant will implement an Environmental Training Program. Prior to beginning work, all contractor personnel assigned to the field for construction-related activity shall attend a mandatory one-time Worker Environmental Training Program presented by the project developer's Environmental Compliance Team. The presentation shall review topsoil salvage, access restrictions, general site restrictions, and other environmental requirements regarding the project. Participants shall sign a statement declaring that they understand and will abide by any guidelines set forth in the material presented.

The LCWD and LCPD have prepared specific plans that include measures to avoid or reduce potential impacts from the Proposed Action. These supplemental plans were included as appendices in the draft POD submitted by the LCWD as part of the ROW application. The supplemental plans in the POD for the Proposed Action are described in **Table 5-1**.

Table 5-1
Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan	Description Summary/Highlights	Resource Element
Environmental Management Plan	Describes procedures the LCWD and its construction and reclamation contractors would use during construction and reclamation of the Proposed Action to ensure compliance with environmental requirements and conditions stipulated in the POD. LCWD would use the Environmental Management Plan to guide coordination of procedures that minimize impacts to environmental resources during construction and operation of the Proposed Action. The LCWD would employ on-site Construction and Environmental Inspectors to ensure compliance with all regulatory requirements.	Includes measures designed to reduce or minimize construction-related impacts on: Soil Resources Water Resources Vegetation Communities Wildlife Habitat Air Quality Archeological Resources and Historic Properties
SWPPP	Describes measures to protect water quality and manage storm water during construction-related activities. Identifies BMPs to reduce the introduction of pollutants to storm water, remove excess sediments from storm water before flowing offsite, and reduce the velocity of storm water flowing offsite. BMPs implementation coupled with the reestablishment of existing contours and vegetation along the project corridor, would minimize the potential for erosion.	Includes measures designed to reduce or minimize construction-related impacts on: Soil Resources Water Resources Vegetation Communities Wildlife Habitat Air Quality

Table 5-1
Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan	Description Summary/Highlights	Resource Element
Revegetation Plan	Describes procedures the LCWD and its contractors would use to conduct revegetation of the disturbed areas. Describes seedbed preparation; seed mixtures; seeding, salvaging, and transplanting methods; revegetation schedule; post-construction monitoring; evaluation of revegetation success; remediation; and reporting. Post-construction monitoring would be conducted by LCWD or its successors or assignees.	Includes measures designed to reduce or minimize construction-related impacts on: Soil Resources Water Resources Vegetation Communities Wildlife Habitat Air Quality
Noxious Weed Management Plan	Includes site-specific measures that LCWD and its contractors would implement to control noxious weeds including, but not limited to, the use of cleaned, weed-free equipment, pressure washing of all vehicles and equipment prior to arrival at the work site, and the use of certified weed-free straw/hay bales to control erosion. A key element of the Noxious Weed Management Plan is to identify and treat existing weed infestations prior to construction.	Includes measures to reduce the spread of noxious weed and impacts to vegetation communities and wildlife habitats.
Access Road Plan	Describes measures to be taken by LCWD or its contractors to access project facilities and the ROW, reclaim temporary access roads, and prevent unauthorized vehicle use of the project ROW. Includes descriptions of access routes and transportation-related activities.	Includes measures to minimize the use of access roads, thereby reducing potential impacts to vegetation communities, wildlife habitat, potential spread of noxious weeds and potential for air quality issues, sedimentation, and erosion.
Fire Mitigation Plan	Identifies measures to be taken during construction, operation, and maintenance of the project facilities to prevent and suppress fires. The purpose is to establish standards and practices to minimize the risk of fire or, in the event of fire, to implement immediate suppression procedures.	Includes measures designed to reduce or minimize construction-related impacts on: Soil Resources Water Resources Vegetation Communities Wildlife Habitat Air Quality

Please refer to **Table 6-2** for representative specific mitigation measures applicable to the above summarized supplemental plans.
BMP – Best Management Practice
LCWD – Lincoln County Water District
NDEP – Nevada Division of Environmental Protection
POD – Plan of Development
SPCCC – Spill Prevention, Containment, Countermeasure, and Cleanup
SWPPP – Storm Water Pollution Prevention Plan

Additional conservation measures proposed by the Applicant will be implemented during construction and operations as specified in **Table 5-2**.

Table 5-2
Standard Construction and Operations Procedures

To the extent practicable, native shrubs and other vegetation will be preserved and protected during construction operations except where clearing operations are required for permanent structures, approved construction roads, and excavation operations.
To the extent practicable, all maintenance yards, field offices, and staging areas will be arranged to preserve shrubs and other native vegetation.
Clearing will be restricted to that area needed for construction.
All areas around structures will be backfilled, compacted, and returned as close as possible to the original condition and grade.
Signs will be placed along the access roads to discourage off-highway vehicle use of adjacent areas.
Project construction and traffic will remain within the construction ROW, facility footprints, and approved access roads.
Clearance surveys will be performed prior to any construction activities within the ROWs. Any tortoises located shall be handled and relocated by a qualified tortoise biologist in accordance with USFWS-approved protocol (Desert Tortoise Council 1994, revised 1999). Burrows containing tortoises or nests shall be excavated by hand, with hand tools, to allow removal of the tortoise or eggs. Desert tortoises moved during the tortoise inactive season or those in hibernation, regardless of date, must be placed into an adequate burrow; if one is not available, one shall be constructed in accordance with Desert Tortoise Council (1994, revised 1999) criteria. During mild temperature periods in the spring and early fall, tortoises removed from the site shall not necessarily be placed in a burrow. Tortoises and burrows shall only be relocated to federally managed lands. If the responsible federal agency is not the BLM, verbal permission, followed by written concurrence, shall be obtained from BLM and USFWS before relocating the tortoise or eggs to lands not managed by the BLM.
Construction monitoring will employ a field contact representative, authorized biologist(s), and qualified biologist(s) during construction activities except in those areas with high disturbance. USFWS employs a specific set of guidelines for such monitoring.
Tortoises requiring moving will only be handled by the authorized and qualified tortoise biologist or other trained personnel approved by USFWS and NDOW. All tortoise handlers will possess a desert tortoise handler's permit issued by the USFWS and NDOW.
A 25 mph project access road speed limit will be enforced for all project vehicles and personnel.
The area limits of project construction and survey activities would be predetermined based on the temporary and permanent disturbance areas noted on the final design engineering drawings to minimize environmental effects arising from the project, with activity restricted to and confined within those limits.
Littering is not allowed. Project personnel would not deposit or leave any food or waste in the project area, and no biodegradable or nonbiodegradable debris would remain in the ROW following completion of construction.
No wildlife, including rattlesnakes, may be harmed except to protect life and limb.
Project personnel are not allowed to bring pets to any project area in order to minimize harassment or killing of wildlife and to prevent the introduction of destructive animal diseases to native wildlife populations.
Wildlife species may not be collected for pets or any other reason.
Project supplies or equipment where wildlife could hide shall be inspected prior to moving or working on them, to reduce the potential for injury to wildlife. Supplies or equipment that cannot be inspected or from which wildlife cannot escape or be removed, shall be covered or otherwise made secure from wildlife intrusion or entrapment at the end of each work day.
All steep-walled trenches or excavations used during construction shall be inspected twice daily (early morning and evening) to protect against wildlife entrapment.

Table 5-2 **Standard Construction and Operations Procedures**
All new access roads constructed as part of the project that are not required as permanent access for future project maintenance and operation would be permanently closed to minimize impacts from increased public access.
To minimize perching opportunities for raptors near habitats supporting sensitive prey species, select structures incorporating a design to discourage raptor perching.
Only the minimum amount of vegetation necessary for the construction of structures and facilities will be removed. Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate re-growth of vegetation.
Construction holes left open overnight shall be covered. Covers shall be secured in place nightly, prior to workers leaving the site, and shall be strong enough to prevent livestock or wildlife from falling through and into a hole. Holes and/or trenches shall be inspected prior to filling to ensure absence of mammals and reptiles.
Where necessary, a biological resource monitor shall be present during the construction to ensure resources are protected in the construction area.
Excavations shall be sloped on one end to provide an escape route for small mammals and reptiles.

An Environmental Inspector will be onsite as well, and the responsibilities of the Environmental Inspector are detailed in **Table 5-3**.

Table 5-3 **General Responsibilities of the Environmental Inspector**
Advisory
• Advise construction and inspection personnel as necessary regarding compliance with project environmental requirements. • Advise on major decisions such as wet weather shut-downs, emergency erosion/sediment control, and other courses of action to deal with major unexpected environmental conditions. • Provide immediate response to spills in accordance with state and federal regulations and Spill Prevention, Containment, Countermeasure, and Cleanup (SPCCC) plan. Advise management and inspection staff on the cleanup and disposal of spilled material and any affected soils and vegetation. • Proactively plan ahead to facilitate environmental compliance in difficult areas and provide troubleshooting advice in advance of construction. • Conduct environmental training for construction crews, including informal tailgate briefings. • Check weather reports and inform construction management of potential heavy rain forecasts.
Construction Oversight
• Ensure that all wastes including garbage, oil, grease, chemicals, unsalvageable timber, rock, etc. are disposed of in an authorized manner. • Conduct water, soil, and biological monitoring/sampling as necessary. • Review construction methodologies with the contractor and inspection staff to ensure implementation of the appropriate construction and mitigation methods for prevailing conditions. • Coordinate the deployment of special environmental monitors to provide specialized monitoring of sensitive resource issues including species of concern, soils, erosion and sediment control, restoration, and cultural resources. • Contact BLM representative in the event that rare plant, vertebrate, or invertebrate fossils are discovered • Evaluate the construction contractor's implementation of the environmental mitigation measures required in the contract documents and all other authorizing documents. • Verify that the limits of authorized construction work areas and access roads are marked prior to clearing. • Oversee the location of dewatering structures and slope breakers to ensure they will not direct water into known cultural resource sites, erosion-prone sites, or sensitive plant populations.

Table 5-3
General Responsibilities of the Environmental Inspector

• Verify that trench dewatering activities do not result in the deposition of sand, silt and/or sediment near the point of discharge into a wetland or water body. • Ensure that grading returns sites to natural grade except as otherwise approved by the authorized change orders. • Confirm that all erosion control measures are adequate to handle forecasted rain events, including severe storms, and work with construction personnel and regulatory agencies to ensure erosion control measures are promptly and properly installed. • Conduct periodic post-cleanup inspections of the restored right-of-way to identify potential stabilization or revegetation failure. Develop a list of outstanding items to be corrected and revise their status accordingly.
Documentation
• Document construction contractor conformance with all company environmental specifications, policies, plans, drawings, commitments, and agency grants and permit requirements (collectively referred to as Project Environmental Requirements). • Prepare Daily Environmental Inspection Reports to address progress of the project and details of all non-compliance situations, including instructions for follow-up measures. These reports will be e-mailed to the BLM Compliance Manager at the end of each work day. • Document the implementation of temporary and permanent erosion control and revegetation programs during construction. • Maintain records on cleanup and restoration data.
Liaison
• Provide liaison with landowners and government agencies as necessary. • Coordinate agency review and approval of field design change orders.

Prior to surface-disturbing activities associated with the Proposed Action, the Applicant shall pay remuneration fees for compensation of desert tortoise habitat loss. Remuneration fees will be paid based on acreage of disturbance and will vary depending on the whether the affected habitat is within or outside of desert tortoise critical habitat.

6.0 DETERMINATION

6.1 MOAPA DACE

Implementation of the Proposed Action "may affect, is likely to adversely affect" the Moapa dace downstream of the project area in the Muddy River. This determination is based on the following considerations:

- Indirect impacts on the Moapa dace could include reduced surface water flows in the Muddy River possibly resulting in decreases in flow rates thereby decreasing pool and riffle habitat and potentially reducing temperatures which may reduce the amount of spawning habitat.

Based on all of the foregoing, it is concluded that the project is likely to adversely affect the Moapa dace. However, the project would not jeopardize the continued survival or future recovery of the Moapa dace. The project is not anticipated to directly affect Moapa dace habitat. Indirect effects may occur within Moapa dace habitat, but it is not anticipated any Moapa dace habitat will be impacted in a way that would affect long-term viability of the Moapa dace population in the region.

6.2 DESERT TORTOISE

Implementation of the Proposed Action "may affect, is likely to adversely affect" the desert tortoise in the project area. This determination is based on the following considerations:

- Construction-related impacts on the desert tortoise could include direct mortality or injury as a result of being crushed by vehicles and disturbance of soil. During pedestrian surveys of the proposed corridor route, desert tortoise sign (e.g., scat, tracks, burrows, shell fragments) were observed at locations along the ROW. In addition to the direct and indirect effects of construction on the tortoise, potential temporary and permanent acreages have been estimated for the project. An estimated 191 acres of temporary disturbance, of which 157.6 acres are within critical habitat, and 23 acres of permanent disturbance, of which 19.6 acres are within critical habitat, would be attributed to the project. Upon completion of the project, all temporary and permanent disturbance areas would be professionally surveyed (e.g., via Global Positioning System), and a final acreage report would be submitted to the USFWS and BLM to be incorporated into the agency-administered cumulative 1 percent total disturbance acreage database.

Based on all of the foregoing, it is concluded that the project is likely to adversely affect the desert tortoise. However, the project would not jeopardize the continued survival or future recovery of the desert tortoise. The project is anticipated to directly affect habitats within the Mormon Mesa Critical Habitat Unit. Direct disturbance will occur within this critical habitat unit, but it is not anticipated that any of the primary constituent elements used to determine critical habitat will be impacted in a way that would affect long-term viability of the desert tortoise population in the region. Because linear features will not be fenced and all areas not needed for O&M activities will be revegetated, it is expected that habitat conditions and movement corridors will only be affected during the construction phase of the project.

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APPENDIX A USFWS LETTER

APPENDIX B USFWS STIPULATED AGREEMENT

APPENDIX C DESERT TORTOISE SURVEY REPORT