BLM
Nevada State Office

FINAL ENVIRONMENTAL IMPACT STATEMENT

Kane Springs Valley Groundwater Development Project

FES 08-01

Cooperating Agencies:
U.S. Fish and Wildlife Service
Nevada Department of Wildlife
Moapa Valley Water District

February 2008

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Nevada State Office
P.O. Box 12000 (1340 Financial Blvd.)
Reno, Nevada 89520-0006
http://www.blm.gov/nv/st/en.html

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In Reply Refer to:

2800 (NV-910)
N79742

February 2008

Dear Reader:

Enclosed for your review is the *Kane Springs Groundwater Development Project Final Environmental Impact Statement* (EIS) that evaluates separate rights-of-way applications to construct and operate a water development and pipeline conveyance system, a telephone utility line, and a power line across public land administered by the Bureau of Land Management (BLM). Cooperating agencies for this Final EIS include: U.S. Fish and Wildlife Service, State of Nevada Department of Wildlife, and Moapa Valley Water District.

The BLM compiled a Draft EIS that analyzed the three separate plans of development submitted to BLM by Lincoln County Water District, Lincoln County Telephone and Lincoln County Power District. The Draft EIS was released to the public on June 22, 2007, with publication of a Notice of Availability (NOA) in the *Federal Register*. The NOA initiated a 60-day public comment period ending on August 20, 2007. Public meetings were held July 30, 2007 through August 2, 2007. The BLM received comments on the Draft EIS through 19 letters and emails. The BLM reviewed the comments and provided written responses in this Final EIS. Some comments resulted in modifications to text in the EIS. This Final EIS is a "full text" document that contains the entire EIS and supersedes the Draft EIS.

Although water rights, pumping rates, volume of water proposed for transfer annually to northern Coyote Spring Valley and point of use of water proposed for transport across public land are under the purview of the Nevada State Engineer and outside the jurisdiction of the BLM, these issues have been included in this document. Water distribution and use associated with development of the Coyote Spring Valley has been addressed by local and regional planning agencies in accordance with Nevada statutes; these issues are included in this document.

The Kane Springs Groundwater Development Project Final EIS will be available for 30 days. A description of new or missed information within this Final EIS may be submitted within the thirty days to:

Penny Woods, Groundwater Projects Manager
Bureau of Land Management (NV-910)
P.O. Box 12000
Reno, NV 89520
FAX: 775.861.6689
Email: nvgwprojects@blm.gov

The BLM will issue one or more records of decision (ROD) based on this Final EIS. The ROD(s) will not be issued until other agency permits and approvals have been finalized and their conditions of approval will be incorporated into the ROD(s). For more information, Please contact Penny Woods at 775.861.6466.

Environmental Impact Statement
for the Kane Springs Valley Groundwater Development Project

( ) Draft **(X) Final**

Lead Agency:	United States Department of the Interior Bureau of Land Management
Cooperating Agency:	United States Fish and Wildlife Service Nevada Department of Wildlife Moapa Valley Water District
Counties Directly Affected:	Lincoln County, Nevada

Environmental Impact Statement Contact:

Penny Woods, Nevada Groundwater Project Manager
U.S. Bureau of Management, Nevada State Office
P.O. Box 12000
Reno, Nevada 89520-0006

Date Final EIS filed with U.S. Environmental Protection Agency: February 8, 2008

Abstract

The Ely District of the Bureau of Land Management (BLM) has prepared this Final Environmental Impact Statement (EIS) in response to a right-of-way (ROW) application submitted by the Lincoln County Water District (LCWD or Applicant) to construct and operate the Kane Springs Valley Groundwater Development Project (Proposed Action). The BLM's approval of ROWs to the LCWD, Lincoln County Power District No. 1 (LCPD), and the Lincoln County Telephone Company (LCT) would allow construction of infrastructure required to pump and convey groundwater resources in the Kane Springs Valley Hydrographic Basin to help meet future municipal water needs in the Coyote Spring Valley area. Components of the Proposed Action would include:

Water Facilities
- Groundwater production/monitoring wells (well fields)
- Water collection pipelines
- Transmission pipeline
- Terminal storage tank
- Forebay storage tank

Electric Utility Facilities
- Electrical distribution and transmission lines
- Electrical substations

Communication Facilities

- Telemetry system/fiber optic lines

The project facilities would be located in southern Lincoln County, Nevada, within or immediately adjacent to the 2,640-foot wide utility corridor established by the Lincoln County Conservation, Recreation, and Development Act under Public Law 108-424 (LCCRDA). Enacted on November 30, 2004, Title III of the LCCRDA directed Congress to designate utility corridors to 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, subject to the requirements of the National Environmental Policy Act (NEPA).

Project construction would occur in three phases with 1 to 3 years between phases. Construction would begin at the southwest end of the project area (near the intersection of U.S. Highway 93 and Kane Springs Road) and continue to the northeast (generally following Kane Springs Road). Construction of Phase 1 would begin upon acquisition of necessary permits, approval, and grants and would occur over a 90- to 180-day period. Phase 2 and Phase 3 construction would be completed in 30 to 60 days at 1- to 3-year intervals after completion of Phase 1, and would correspond to the demand for water and the issuance of future water rights.

Multiple ROW grants may be issued based on the analysis in this EIS. The LCWD would be responsible for construction and operation of the proposed groundwater facilities subject to the terms and conditions of BLM Serial Number N79742. The LCPD and the LCT activities would be authorized under separate ROW grants. The ROWs for the water production/delivery system, electrical distribution system, and the fiber optic lines within the congressionally designated LCCRDA corridor would be issued in perpetuity pursuant to Title III of the LCCRDA.

This EIS considers the expected environmental effects associated with granting of ROWs across public land and subsequent construction and operation of the Proposed Action. The BLM will use the EIS when rendering a decision whether to grant the requested ROWs. The BLM's action is to either grant or deny the request for ROWs through public land administered by the BLM.

This Final EIS satisfies the requirements of the NEPA, which mandates that federal agencies analyze the environmental consequences of major federal actions.

Official responsible for the environmental impact statement:

1/3/08

John Ruhs
Ely District Manager, Nevada

Date

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The Ely District of the Bureau of Land Management (BLM) has prepared this Final Environmental Impact Statement (EIS) in response to a right-of-way (ROW) application submitted by the Lincoln County Water District (LCWD or Applicant) to construct and operate the Kane Springs Valley Groundwater Development Project (Proposed Action). The Applicant is seeking a ROW from the BLM for the purpose of developing and conveying water rights that have been permitted or may be permitted to the LCWD in Kane Springs Valley for use by Lincoln County customers. As of February 2007, 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 Kane Springs Valley Hydrographic Basin. The LCWD has submitted four additional water rights applications to the Nevada State Engineer to withdraw additional groundwater from the Kane Springs Valley Hydrographic Basin. These applications are still pending before the Nevada State Engineer.

The LCWD, in cooperation with the Lincoln County Power District No. 1 (LCPD) and Lincoln County Telephone (LCT), intends to construct groundwater facilities and ancillary utility infrastructure designed to pump and convey up to 5,000 AFY of groundwater for delivery to the northern portion of the Coyote Spring Valley. The project facilities would be located in southern Lincoln County, Nevada, within or immediately adjacent to the 2,640-foot wide utility corridor established by the Lincoln County Conservation, Recreation, and Development Act (LCCRDA) of 2004 (Public Law 108-424). **Map ES-1** shows the general location of the project within southern Lincoln County, Nevada. Primary components of the Proposed Action include:

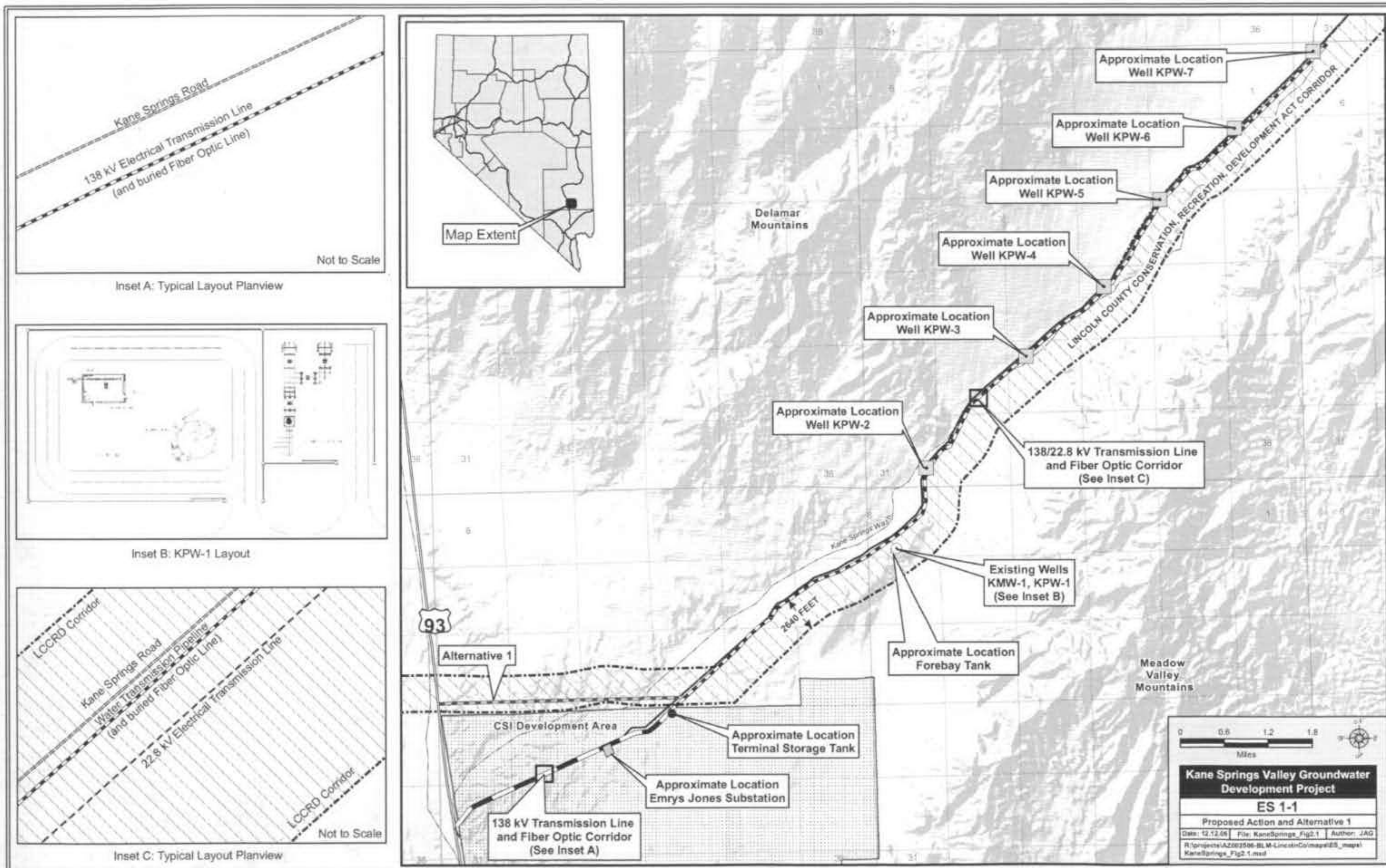
Water Facilities

- Up to seven groundwater production wells[1] (well field)
- Monitoring wells[1]
- Water collection pipeline from each well to main transmission pipeline (up to 9.4 miles - actual length and diameter depending on final well location and flow rates)
- Main water transmission pipeline (up to 3.8 miles)
- Forebay water storage tank (up to 50,000 gallons)
- Terminal water storage tank (up to 700,000 gallons, located on private land)

Electric Utility Facilities

- 138 kilovolt (kV) transmission line (up to 3 miles on private lands; 10.7 miles on federally managed lands).
- Emrys Jones Substation (located on private land)

[1] A monitoring well (referred to as KMW-1) was completed in 2005 to assess the hydrogeology of Kane Springs Valley, obtain data to support the drilling of a water production well and to assist in revising the preliminary production well design. Following the construction and development of KMW-1, a production well (referred to as KPW-1) was constructed in late 2005 immediately adjacent to KMW-1.



Kane Springs Road
138 kV Electrical Transmission Line
(and buried Fiber Optic Line)
Not to Scale
Inset A: Typical Layout Planview
Inset B: KPW-1 Layout
LCCRD Corridor
Kane Springs Road
Water Transmission Pipeline
(and buried Fiber Optic Line)
22.8 kV Electrical Transmission Line
LCCRD Corridor
Not to Scale
Inset C: Typical Layout Planview
Map Extent
Delamar Mountains
Approximate Location Well KPW-7
Approximate Location Well KPW-6
Approximate Location Well KPW-5
Approximate Location Well KPW-4
Approximate Location Well KPW-3
Approximate Location Well KPW-2
LINCOLN COUNTY CONSERVATION, RECREATION, DEVELOPMENT ACT CORRIDOR
138/22.8 kV Transmission Line and Fiber Optic Corridor (See Inset C)
Kane Springs Wash
Existing Wells KMW-1, KPW-1 (See Inset B)
2640 FEET
93
Approximate Location Forebay Tank
Alternative 1
Meadow Valley Mountains
CSI Development Area
Approximate Location Terminal Storage Tank
Approximate Location Emrys Jones Substation
138 kV Transmission Line and Fiber Optic Corridor (See Inset A)
0 0.6 1.2 1.8
Miles
Kane Springs Valley Groundwater Development Project
ES 1-1
Proposed Action and Alternative 1
Date: 12.12.06 File: KaneSprings_Fig2.1 Author: JAG

- Up to seven well substations adjacent to each groundwater production well

Communication Facilities

- Telemetry system/fiber optic lines

The BLM may issue multiple ROW grants based on the analysis in this EIS. The LCWD would be responsible for the construction and operation of the groundwater production facilities subject to the terms and conditions of BLM Serial Number N79742. The LCPD and the LCT would be required to apply for, and obtain, separate ROWs for their activities under the terms and conditions of the Federal Land Policy and Management Act (FLPMA). The ROWs for the water production/delivery system, electrical distribution system, and the fiber optic lines within the congressionally designated LCCRDA corridor would be issued in perpetuity pursuant to Title III of the LCCRDA.

Construction activities would occur in three phases, with 1 to 3 years between phases. Construction would begin at the southwest end of the project area (near the intersection of U.S. Highway 93 and Kane Springs Road) and continue to the northeast (generally following Kane Springs Road). Construction of Phase 1 would begin upon acquisition of necessary permits, approval, and grants and would occur over a 90- to 180-day period. Phase 2 and Phase 3 construction would be completed in 30 to 60 days at 1- to 3-year intervals after completion of Phase 1, and would correspond to the demand for water and the issuance of permits for additional water rights.

The Kane Springs Valley Groundwater Development Project EIS evaluates the BLM action (issuance of ROWs across BLM-administered public lands) and the potential environmental effects that would result from implementation of the Proposed Action (construction and operation of the Proposed Action).

ES-1.1 PROJECT PURPOSE AND NEED

In order to convey the groundwater from the point of origin to the Coyote Spring Valley, the LCWD has submitted a ROW application to the BLM for the Proposed Action. The Proposed Action includes construction and operation of groundwater production wells, pipelines, pumping stations, storage facilities, telemetry facilities, telephone service and power facilities, as outlined above, that cross or occupy BLM-administered public lands.

Pursuant to Title III of the LCCRDA, Congress directed the BLM to conduct a National Environmental Policy Act (NEPA) analysis of any ROW application submitted for the construction and operation of utility infrastructure within the designated 2,640-foot LCCRDA utility corridor. This EIS is intended to fulfill the requirements of NEPA by disclosing the potential environmental impacts of granting the requested ROWs for the Proposed Action and of a reasonable range of alternatives to the Proposed Action.

The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulation [CFR] 1502.13) require the purpose and need of an EIS to "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."

The Applicant is seeking a ROW from the BLM for the purpose of developing and conveying water rights that have been permitted or may be permitted to the LCWD in Kane Springs Valley for use by Lincoln County customers. The purpose of the Proposed Action is to provide ROW access for transporting water resources across areas of BLM-administered public land.

The Proposed Action would assist in meeting a portion of the water demands of Lincoln County and is a component of Lincoln County's Water Plan. The three key elements identified in the 1999 Lincoln County Water Plan include:

- Assist and support the needs of local communities in Lincoln County, including Coyote Spring Valley;
- Meet the needs of future economic development within Lincoln County; and
- Produce, purchase, wholesale and transport water from sources inside of Lincoln County to meet customer water needs across the region.

Development is underway in the adjacent Coyote Spring Valley. Currently, 16,304 AFY of groundwater have been permitted within the Coyote Spring Hydrographic Basin for a variety of uses. Groundwater from Kane Springs Valley would supplement these uses which include municipal, agricultural and industrial applications.

The BLM's decision is to grant or deny the LCWD's ROW application. The BLM uses a comprehensive process to determine whether ROWs on BLM-administered public lands should be granted. This process includes compliance with the requirements of the NEPA and CEQ regulations, BLM planning regulations, manuals and handbooks, and applicable policy documents.

ES-1.2 AGENCY CONSULTATION AND PUBLIC PARTICIPATION

ES-1.2.1 Public Participation

A public scoping period was provided by the BLM to allow for an early and open process for determining the scope of issues related to the Proposed Action. A Notice of Intent (NOI) to prepare the Draft EIS was published in the Federal Register (Volume 71, No. 62) on March 31, 2006. The notice encouraged the public and other federal, state, local and Tribal governments to assist the BLM in identifying issues to be considered by the BLM for evaluation in this EIS.

The BLM held six open house meetings between April 11, 2006 and April 18, 2006. A summary report of scoping comments received during the scoping period is provided in the Kane Springs Valley Groundwater Development Project Environmental Impact Statement Scoping Report (BLM 2006). A copy of this report is available for download at the BLM Nevada State Office website located at www.nv.blm.gov.

Based on comments received during the scoping process, the following general categories of issues were identified as summarized below.

- ***NEPA Process*** – Eighty-six comments were received specific to the NEPA process; particularly, how closely the EIS would follow the NEPA process.
- ***Social Resources*** – Fifty-one comments were received specific to concerns about impacts on the human or built environment. Scoping comments were provided on the following resources: 1) Visual Resources; 2) Noise; 3) Land Use (including Transportation, Mineral Resources, and Range Resources); 4) Areas of Critical Environmental Concern, Wilderness, and Other Special Use Areas; 5) Recreation; 6) Socioeconomic Resources; 7) Solid Waste and Hazardous Materials; 8) Environmental Justice; 9) Paleontology; and 10) Archeological Resources and Historic Properties.
- ***Physical and Biological Resources*** – Ninety comments were received specific to concerns about impacts on components of the physical environment. Scoping comments were provided on the following resources: 1) Air Quality; 2) Biological Resources (including Endangered, Threatened, Proposed and Candidate Species, Fisheries, Migratory Birds, Vegetation, Noxious Weeds, and Wetlands/Riparian Habitat); 3) Geologic Resources; 4) Soil Resources; and 5) Water Resources.

ES-1.2.2 Public Controversy

The BLM acknowledges that areas of controversy exist regarding the extraction of groundwater on public lands. There is a common misconception concerning the jurisdiction of the Nevada State Engineer and the BLM with respect to the appropriation of water rights in Nevada. As the federal land manager, the BLM has the responsibility to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. Although the BLM has the authority and responsibility to coordinate with agencies and water rights applicants to protect the federal land resources, it is the responsibility of the Nevada State Engineer's Office to approve and control the amount and location of groundwater pumped from basins in Nevada, regardless of ownership.

To develop infrastructure to pump and convey groundwater across the BLM lands, the groundwater developer must obtain ROW approval from the BLM. Because the application process for obtaining a groundwater right from the Nevada State Engineer and approval of a BLM ROW grant may take several years, the process for both normally follows a parallel path. Both agencies must consider the best available information to assist in their decision-making process.

The BLM must rely on the best available data when considering the expected environmental effects associated with granting ROWs across public lands. The data analyzed in this EIS includes regional studies conducted by federal, state, and local agencies and organizations; private developers and their consultants; and more localized studies conducted by the Applicant to support their water rights applications to the Nevada State Engineer. In addition, the BLM conducted project-specific biological and cultural surveys as part of the NEPA process for this EIS. The data analyzed comprises the best available representation of current and predicted conditions at this time. The BLM acknowledges that the Applicant and other entities continue to expand the body of knowledge regarding groundwater development in the project area and regional aquifer system to support future water rights applications. These data will be used by the Nevada State Engineer in the decision to approve or deny future applications. Existing and permitted water rights will be subject to the terms and conditions directed by the Nevada State Engineer. Construction and operation of infrastructure associated with the Proposed Action on federal lands will be subject to the terms and conditions directed by the BLM as part of the ROW grant.

To date, the Nevada State Engineer has appropriated 1,000 AFY of groundwater, with additional applications pending. The bounded analysis for this EIS is to pump and convey up to 5,000 AFY with a phased construction approach. Actions connected to the Proposed Action but outside the BLM jurisdiction include the location of groundwater diversions and amount of groundwater permitted by the Nevada State Engineer; groundwater monitoring and management agreements between the Applicant and the Nevada State Engineer; and wildlife and groundwater monitoring, management; and mitigation agreements between the Applicant and the U.S. Fish and Wildlife Service (USFWS).

ES-1.2.3 Agency Consultation

Federal and state agencies were contacted individually to gather input for the EIS. Consultation was conducted with other resource management agencies at the federal and state levels to identify common concerns related to the Proposed Action or Alternatives. Cooperating agencies on this EIS include the USFWS, Nevada Department of Wildlife (NDOW), and the Moapa Valley Water District (MVWD). In addition, the U.S. Geological Survey (USGS) has provided technical guidance related to water resources issues. Consultations with federal, state, and local resource management and regulatory agencies, as well as interested Tribal governments, have occurred and are ongoing.

A biological assessment was prepared for the Proposed Action and submitted to the USFWS as required by Section 7 of the Endangered Species Act (ESA) of 1973. A species list was requested from the USFWS at the beginning of the Section 7 process. The species list identified plant and wildlife species listed as threatened, endangered or candidate species within the project area. At the request of the USFWS, rare plant and desert tortoise surveys were conducted within the project area.

To satisfy Section 106 of the National Historic Preservation Act (NHPA) requirements concerning consulting with appropriate Native American Tribes, the BLM consulted with Native American Tribes that claim ancestral ties to, or traditional culture use of, project area lands. In March 2006, the BLM mailed copies of an "interested parties" letter under the NEPA guidance to the following groups:

- Moapa Band of Paiutes
- Paiute Indian Tribe of Utah
- Las Vegas Paiute Tribe
- Kaibab Paiute Tribe (Arizona)
- Yomba Shoshone Tribe
- Ely Shoshone Tribe

- Duckwater Shoshone Tribe
- Shoshone Paiute Business Council

The consultation letter provided a brief description of the Proposed Action and requested 1) Tribal input regarding any concerns about traditional cultural practices or other issues that might be affected by the Proposed Action; 2) information on how they would like to be involved in the planning process; 3) names of other individuals or organizations that should be notified or consulted about the project; and 4) an invitation to the Tribal Coordination Meeting at the BLM Ely District Office, Ely, Nevada, on May 18, 2006. A copy of the NOI, a map of the project area, and a brief description of the preliminary issues to be considered in the plan were enclosed with each of these letters.

On May 18, 2006, representatives from the Ely Shoshone Tribe and the Duckwater Shoshone Tribe attended a Tribal Coordination Meeting at the BLM Ely District Office, Ely, Nevada. Information about the Proposed Action was presented to Tribal representatives. The Ely Shoshone Tribe and the Duckwater Shoshone Tribe expressed their concerns and interest with continued consultation with the Proposed Action.

In a further effort to elicit Tribal issues and concerns, the Moapa Band of Paiutes and the Las Vegas Paiute Tribe were invited by the BLM to visit the project area in person. On November 30, 2006 the Moapa Band of Paiutes and the Las Vegas Paiute Tribe visited the project area. Representatives from the Moapa Band of Paiutes indicated they would submit written comments to the BLM expressing their concerns and interest with continued consultation with the Proposed Action. As of the writing of this Final EIS, the BLM has received no formal responses from the Moapa Band of Paiutes or Las Vegas Paiute Tribe following the site visit. Currently, there is no known effect on the integrity of resources of concern or interest to the Tribes in the area, or any specific expressions of concern for the proposal.

ES-1.3 PROPOSED ACTION AND ALTERNATIVES

ES-1.3.1 Proposed Action

Construction of the Proposed Action would occur in three phases, with 1 to 3 years between construction phases. Phases and sequence of construction 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 AFY to the LCWD for groundwater withdrawal from the carbonate aquifer within the Kane Springs Valley Hydrographic Basin (Ruling 5712). This appropriation granted four points of diversion and 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.

Under both the Proposed Action and Alternative 1, the well field pipeline collection system is expected to be located on the south side of Kane Springs Valley Road and would be contained within the BLM-granted ROW, which would be located entirely within the 2,640-foot wide LCCRDA utility corridor. Up to seven well sites would extend from the southwest edge of the well field (beginning at Well KPW-1) to the northeast edge of the well field (Well KPW-7). Wells KPW-2 through KPW-6 would be spaced at 1.3- to 1.8-mile intervals between wells

KPW-1 and KPW-7. These are approximate locations and may be modified based on additional geologic and hydrologic investigations.

The well construction sequence may vary by phase, depending on well output and other factors. Although Phase 1 is proposed to include up to four wells (at this time it is anticipated that KPW-1, KPW-3, KPW-5 and KPW-7 would be constructed), it may be possible to achieve production from two or three wells (KPW-1, KPW-5 and KPW-7, for example). In this case, wells not completed in Phase 1 could be developed in Phase 2 or 3, if needed. The following section outlines anticipated construction sequence by phase.

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: 138 kV transmission line (up to 3 miles on private lands; 10.7 miles on BLM-administered public lands).
- Electrical Substations: Emrys Jones Substation (located on private land). Four step-down substations, one associated with each well (on BLM-administered public lands).
- Ancillary Facilities: access roads and temporary workspaces on private and BLM-administered public lands, 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 Stipulation Agreement between the USFWS and the LCWD.
- Extra Work Space: up to 50 acres total; each work space would occupy approximately 2 acres 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

- As part of Phase II, the LCPD proposes to construct two additional step-down substations at the additional well facilities. In addition, the associated interconnection to the transmission line constructed in Phase I would be built at each well site.

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 was 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

- As part of Phase III, the LCPD proposes to construct the final two step-down substations at the additional well facilities. In addition, the associated interconnection to the transmission line constructed in Phase I would be built at each well site.

ES-1.3.1.1 Well Field Pipeline Collection System / Fiber Optic Line

The well field pipeline collection system would consist of individual branch pipelines from each well to a single collection pipeline terminating at the forebay storage tank. The length and diameter of the pipeline would be based on well locations and established flow rates at each well. However, the pipeline is expected to be between 12 inches and 24 inches in diameter and constructed of ductile iron. A fiber optic telemetry cable would be located in the same trench with the buried pipeline.

A 50,000-gallon forebay storage tank would be installed adjacent to KPW-1 and would serve as the termination point for the collection system. A terminal water storage tank, to be located on private property, would ultimately be located at the southern end of the water transmission pipeline to receive the imported water and would be sized to satisfy anticipated water demands in Coyote Spring Valley.

The temporary pipeline construction easement would be between 100 to 150 feet wide based on pipeline size, land use, and topographic constraints. In general, the pipeline would parallel Kane Springs 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.

ES-1.3.1.2 Electrical Distribution System

In order to provide reliable electric service to the well fields, the LCPD proposes to construct the power facilities necessary to support the development of the Kane Springs wells. The LCPD proposes to construct and operate approximately 3 miles of 138 kV transmission line on tubular steel poles from Highway 93 east, along Kane Springs Road to the proposed Emrys Jones Substation. This portion of the 138 kV transmission line would tie into the LCPD's existing transmission line, located west of Highway 93. The poles would be approximately 80 to 100 feet tall with span lengths varying from 400 to 700 feet. The alignment centerline would be located within the permitted ROW south of Kane Springs Road.

The LCPD proposes to construct the proposed Emrys Jones Substation approximately 2.5 miles east of Highway 93 and south of Kane Springs Road. This new facility would transform voltage from 138 kV initially to 25 kV class distribution voltage. From the Emrys Jones substation, the LCPD proposes to construct a 138 kV transmission line on wood poles along Kane Springs Road to each of the proposed well sites. This line would initially be energized at 25 kV class distribution providing service to each of the proposed well sites through individual step-down substations provided at each well site to serve the pump motor and ancillary equipment. The poles would be approximately 65 to 80 feet tall with span lengths varying from 300 to 400 feet. The alignment centerline would be located within the permitted ROW, south of Kane Springs Road.

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 exact location of each project component (e.g., well yard, access road, electric pole structure) cannot be determined until final design is complete. Therefore, assumptions were made to determine impacts of the Proposed Action within a study corridor. For this analysis, the temporary construction corridor is considered to be up to 150 feet wide by 14 miles long (from Highway 93 to the northernmost well). 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. Final ground disturbance would be recalculated for the BLM Plan of Development when final design is complete and the exact location of structures and roads are known.

Table ES-1 Estimated Surface Disturbance By Land Ownership (At Full Build Out Of The Proposed Action)		
	Temporary (acres)*	**Permanent (acres)***
Public (BLM)	167.0	17.0
Private	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).
BLM – Bureau of Land Management

ES-1.3.2 Alternative 1 – 138 kV Power Line Alignment

Alternative 1 would include the same groundwater and electric utility facilities identified for the Proposed Action. However, the 138 kV transmission line and fiber optic /communication lines that extend from the proposed terminal water storage tank to Highway 93 would be located entirely within the designated LCCRDA utility corridor. This portion of the line is approximately 3 miles long. The design and construction of the line would be the same as that described for the 138 kV line in the Proposed Action.

Cross-country access would be required under Alternative 1. Preconstruction clearances would be required prior to any ground-disturbing activities. At a minimum, access would require completion of cultural resource surveys and biological surveys along with appropriate State Historic Preservation Office and USFWS consultation and approvals. Construction activities would be the same as those described under the Proposed Action.

ES-1.3.3 No Action Alternative

The No Action Alternative represents the status quo — not approving or implementing the Proposed Action or Alternative 1. Analysis of the No Action Alternative is required by the NEPA guidelines. Under the No Action Alternative, the BLM would not approve the ROW application as submitted, and the groundwater development project would not be constructed on the BLM-administered public lands. As a result, impacts associated with construction and operation of the Proposed Action on public land would not occur. Nothing in this alternative would prevent the LCWD from making the beneficial uses of their Kane Springs Valley water right in accordance with any water rights permitted by the Nevada State Engineer.

ES-1.3.4 Other Alternatives Considered But Not Evaluated in Detail

An interdisciplinary (ID) Team of resource specialists from various BLM offices, representatives from cooperating agencies, the Applicant's consultants, and the EIS consultant team were assembled to assist in evaluating the environmental issues to be addressed in the EIS. The ID Team analyzed the Proposed Action, Alternatives to the Proposed Action, and the No Action Alternative.

The following criteria were used to establish a threshold for developing potential alternatives that respond to the purpose of and need for the Proposed Action and meet the BLM policy and direction.

- The alternative should be consistent with management guidance contained in the approved Caliente Management Framework Plan and other applicable BLM policy and direction.
- The alternative must meet the purpose of and need for action.
- The alternative must be feasible from technical and economic standpoints while remaining environmentally responsible.
- The alternative must be capable of implementation in a timely manner.

In addition to the Proposed Action and No Action Alternative, one other alternative (Alternative 1) was identified for detailed study. Several other alternatives were considered during initial project planning. They included locating the proposed terminal storage tank on public lands, burying the electrical lines, and installing aboveground pipelines instead of burying the pipelines. These alternatives were eliminated from detailed analysis because they provided no environmental advantage or benefit over the Proposed Action.

ES-1.3.4.1 Terminal Storage Tank on Public Lands

This alternative would include constructing the terminal storage tank on public lands instead of private lands, as proposed under the Proposed Action. This alternative was eliminated from further analysis in the EIS because it provides no advantage over the Proposed Action. Private lands are available for the construction of the tank.

ES-1.3.4.2 Underground Electrical Transmission and Distribution Lines

Selection of this alternative would require the transmission line and distribution lines to be buried parallel to the water transmission and collection pipelines and fiber optic line from the production wells to the terminal storage tank. The transmission line would also be buried from the terminal storage tank to Highway 93. This alternative was eliminated from further analysis in the EIS because, while it is technically feasible to bury transmission lines, it is not cost-effective for construction and maintenance.

The cost of burying transmission lines is estimated to be 7.5 to 12 times higher than traditional overhead construction for a given project (Johnson 2003). Also, it is standard operational procedure for transmission lines within road ROWs to be constructed aboveground to minimize infrastructure constraints within public easements (e.g., installation of public works such as water pipeline and sewer).

ES-1.3.4.3 Aboveground Water Transmission Pipeline

This alternative would involve constructing the water transmission pipeline aboveground (over a distance of approximately 3.8 miles). This alternative was eliminated from further analysis in the EIS because it provides no environmental advantage over the Proposed Action. While it is technically feasible to construct the water transmission pipeline aboveground, this would result in greater visual impacts and may act as a barrier to wildlife. The potential for vandalism and road safety issues would also be greater. Also, it is standard operational procedure for water transmission pipelines to be buried within road ROWs to minimize infrastructure constraints within a public easement.

ES-1.4 AGENCY PREFERRED ALTERNATIVE

The Agency Preferred Alternative is the Proposed Action.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Geological Resources – Sections 3.1 and 4.1		
The Proposed Action would not result in impacts to geologic resources. However, seismic activity in the region could potentially impact the structures and facilities constructed under the Proposed Action. All project components would be constructed in accordance with applicable regulations, engineering protocols and safety standards to minimize any potential impacts to structures from seismic activity.	Impacts to geological resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to geological resources would occur on public lands.
Soil Resources – Sections 3.2 and 4.2		
Approximately 195 acres of surface disturbance from construction of project facilities, of which 167 acres are BLM-administered public lands. Approximately 25 acres would remain permanently impacted by project components (well yards, access roads, and overhead poles); of these approximately 17 acres would be on BLM-administered public lands and approximately 8 acres on private land. Construction of Phases 2 and 3 would result in less than 2.2 acres of additional temporary disturbance, with less than 1.1 acres remaining under additional facilities. Potential impacts to soil resources include increased soil compaction and erosion from wind and water, and chemical changes resulting from mixing surface soils with subsoil during salvage activities. These impacts are expected to be minimized, to the extent possible, following reclamation.	The 138 kV transmission line and buried fiber optic line would be constructed within a 100-foot wide construction easement between Highway 93 and the Emrys Jones Substation - a distance of approximately 2.7 miles. The disturbance corridor would be located entirely within the designated LCCRDA utility corridor. Approximately 32 acres of previously undisturbed desert land would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	No project-related impacts to soil resources would occur on public lands.
Water Resources – Sections 3.3 and 4.3		
Potential impacts to surface water may include increased erosion and sedimentation from surface disturbance related to construction activities and hydrostatic testing water discharges and impacts to water quality from accidental spills. Potential direct impacts to groundwater include impacts to groundwater quantity as a result of drawdown (lowering of the water table) within the well head and potential indirect impacts may be related to lowered yields at regional springs.	Impacts to water resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to water resources would occur on public lands.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Groundwater pumping associated with the Proposed Action will be subject to terms and conditions imposed by the Nevada State Engineer, and the Monitoring, Management, and Mitigation Plan included in the Stipulation Agreement between the USFWS and LCWD. The Stipulation Agreement outlines "trigger points" that serve to minimize adverse impacts including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached.		
Vegetation Resources – Sections 3.4 and 4.4		
Potential direct impacts to vegetation resources associated with construction activities could include crushing and/or removal of native vegetation and introduction of invasive and noxious weeds. Temporary disturbance would be 195 acres, and permanent disturbance would be 25 acres. There would be no direct or indirect impacts to vegetation resources associated with operation and maintenance of the Proposed Action. No potential habitats for federally listed Threatened, Endangered, and Sensitive Plant Species occur within the Proposed Action ROW. Cacti species protected by Nevada law would be salvaged and restored as a part of the Proposed Action's Reclamation Plan.	Approximately 32 acres of additional previously undisturbed Mojave Creosote Bush Scrub and Mojave Desert Wash Scrub vegetation communities would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	No project-related impacts to vegetation resources would occur on public lands.
Wildlife Resources – Sections 3.5 and 4.5		
Direct effects on wildlife resources can result from ground disturbance caused by construction-related activities, which can impact wildlife habitat by removing vegetation, altering plant composition or structure, and/or by altering soil characteristics. Potential indirect effects during construction activities include degradation of soil due to fuel contamination, harassment from human presence, and increased levels of noise and vibration due to construction, equipment movement, or blasting.	Approximately 32 acres of additional previously undisturbed wildlife habitat would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints. Disturbance to desert tortoise habitat under Alternative 1 would be slightly greater than that under the Proposed Action. Approximately 28.2 acres (5.2 acres more than the Proposed Action) of desert tortoise	No project-related impacts to wildlife resources would occur on public lands.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Long-term direct impacts can occur from loss of vegetation and wildlife habitat resulting from continued disturbance from operation and maintenance. Additionally, wildlife species could be temporarily displaced from areas of human activity during operation and maintenance activities. Indirect long term impacts can result from increased public access and project maintenance. The Proposed Action would also have long-term beneficial effects to wildlife in the project area with the development of a local water supply. The desert tortoise is the only federally listed species that may occur within the Proposed Action ROW. Approximately 23 acres of desert tortoise habitat would be permanently disturbed and 195 would be temporarily disturbed by construction of the Proposed Action. A remuneration fee would be paid for each acre disturbed to Lincoln County's Land Disturbance Fee Fund for compensation of desert tortoise habitat loss. There is no habitat for Moapa dace within the project area; however, there is habitat for this species in the Muddy River system approximately 28 miles south of the project area. Groundwater pumping associated with the Proposed Action could have the potential to impact flow rates in the Muddy River system, potentially decreasing pool and riffle habitat. 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) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. Potential impacts to Nevada BLM Sensitive and/or State protected species including gila monster, chuckwalla, and Western Burrowing Owl would be mitigated by specific protection measures described in the Standard Construction and Operation Procedures in Appendix C for the EIS.	habitat would be permanently disturbed by construction of Alternative 1. Approximately 195 acres would be temporarily disturbed. Of these totals, 19.6 acres (federal and private lands) of permanent disturbance would occur in the Mormon Mesa Critical Habitat Unit. Approximately 157.6 acres of temporary disturbance would occur in the Mormon Mesa Critical Habitat Unit. Permanent and temporary disturbance make 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 Road ROW. Approximately 147.2 acres of critical habitat on federal land would be disturbed. As described for the Proposed Action, the environmental protection measures that would be implemented as part of this alternative would reduce potential direct impacts to fish and wildlife species. Impacts to Moapa dace would be the same as the Proposed Action.	

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Direct impacts to birds in the vicinity of the project area include direct mortality from increased human traffic during operation and maintenance activities, direct disturbance of nests, and nest abandonment as a result of increase human presence and/or operation noise.		
Land Use – Sections 3.6 and 4.6		
Approximately 195 acres of surface disturbance from construction of project facilities, of which 167 acres are BLM-administered public lands. Following construction 25 acres (17 acres public, 8 acres private) would be maintained as permanent ROW and aboveground facilities. While land ownership would remain unchanged, grazing and public use of the area may experience short-term disruption during construction. Following reclamation, temporary disturbance areas would be returned to pre-construction conditions. The Proposed Action would not affect access to, nor availability or development of, oil and gas or any locatable/saleable mineral resources in the project area, nor would it reduce forage levels that would lead to grazing impacts in either the Delamar or Grapevine allotments. Implementation of Proposed Action would have short-term impacts on traffic flows and volumes and also may contribute to roadway deterioration of Kane Springs Road during construction. The LCWD has prepared an Access Road Plan which describes environmental protection measures and standard operating procedures for transportation-related activities.	Alternative 1 would be located entirely within the designated LCCRDA utility corridor. Up to 32 acres of previously undisturbed desert would be temporarily disturbed by construction of the 138 kV transmission line and buried fiber optic line. After construction, project components would impact approximately 5 acres (16-foot wide maintenance road and pole footprint).	Land use would not change on federal lands. However, land use changes would continue on adjacent private lands including construction of the Emrys Jones Substation and associated transmission lines.
Areas of Critical Environmental Concern, Wilderness, and Other Special Use Areas – Sections 3.7 and 4.7		
Indirect impacts may affect the Delamar Mountains and Meadow Valley Range Wilderness as a result of increased noise, dust, odors and increased traffic from construction activities. However, these impacts would be temporary and localized. After construction, all areas not permanently impacted by a project facility would be reclaimed and revegetated to pre-construction conditions.	Up to 32 acres of previously undisturbed lands within the Kane Springs ACEC would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	There would be no project-related impacts to ACECs, Wildernesses, or other special use area under the No Action Alternative.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Recreation – Sections 3.8 and 4.8		
Construction activities along portions of Kane Springs Road may temporarily restrict access into surrounding Delamar Mountain and Meadow Valley Range Wildernesses. The Proposed Action would not preclude the use of these areas, but rather would require recreational users to temporarily relocate to surrounding recreation areas if access roads are restricted due to construction. Operation and maintenance of the project facilities would not limit public access to recreation opportunities in the surrounding area.	Impacts to recreation under Alternative 1 would be the same as those described under the Proposed Action.	No project-related impacts to recreational use of public lands would occur under the No Action Alternative.
Air Quality – Sections 3.9 and 4.9		
Construction activities would result in temporary emissions of fugitive dust (particulate matter). These emissions would dissipate following completion of construction and would not be expected to travel great distances from the generation site. Temporary gaseous emissions would be generated during construction from diesel-powered well-drilling and other construction equipment. Emissions would be limited by state and federal regulations, and would be minimized through proper operation and maintenance.	Impacts to air quality under Alternative 1 would be same as those described under the Proposed Action.	Under the No Action Alternative, there would be no short-term construction-related exhaust or fugitive dust impacts. No impacts to air quality would occur under the No Action Alternative.
Noise – Sections 3.10 and 4.10		
Major sources of noise associated with the Proposed Action would be from construction-related equipment and are predicted to be below levels of concern. Equipment used during construction activities would include standard construction and earth moving equipment and well development equipment such as drill rigs. Construction noise levels would be short-term, brief and intermittent. Long-term noise levels associated with wellhead, pump station and pipeline operations would generally be steady and continuous, and are predicted to be at lower levels than construction noise.	Impacts to noise under Alternative 1 would be same as those described under the Proposed Action.	Under the No Action Alternative, the Proposed Action would not be built on public lands. Therefore, there would be no short-term construction noise impacts nor any long-term operation impacts associated with the Proposed Action.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Visual Resources – Sections 3.11 and 4.11		
Short-term visual impacts would occur during construction as views of construction equipment, increased traffic and construction activities are introduced into the local viewshed. Clearing and excavation activities associated with the installation of project components would remove vegetation communities within the pipeline alignment. Immediately following installation, these areas would be reclaimed and revegetated to pre-construction levels. The visual impact of vegetation removal would be minimal because of low color contrast associated with the characteristic vegetation and the underlying soils. The proposed overhead transmission line would be within the foreground distance zone of sensitive viewing areas, which is limited to Highway 93. No other proposed facilities would be visible from sensitive viewing areas, as they are isolated from views by distance or intervening terrain. The Proposed Action would meet the BLM VRM Class IV objectives because they provide for a high level of change to the characteristic landscape.	Impacts to visual resources under Alternative 1 would be similar to those described for the Proposed Action. However, under Alternative 1, the overhead power line would stay entirely within the LCCRDA corridor between Highway 93 and the Emrys Jones Substation. The only sensitive viewing area for this alternative would be along Highway 93. The proposed power lines would be partially screened from view by existing topography along the highway.	The No Action Alternative would result in no project-related impacts to visual resources because no new facilities would be constructed or operated on public lands.
Socioeconomic Resources – Sections 3.12 and 4.12		
Implementation of the Proposed Action would have a minimal affect on the social and economic resources from the associated increase in the level of economic activity. Increased economic activity would result from increased payroll earnings during project construction, which would be spent on items such as housing, food, goods and services. The Proposed Action would not have any direct growth-inducing effects because it is estimated to take from 90 to 180 days to complete and requires a construction work force of no more than 160 workers. Indirect effects may result from continuing planned developments in Clark and Lincoln Counties.	Impacts to socioeconomic resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to socioeconomic resources would occur.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Environmental Justice – Sections 3.13 and 4.13		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations, because these populations are not present in the vicinity of the project area. Therefore, implementation of the Proposed Action would have no impact on environmental justice issues.	Impacts to environmental justice under Alternative 1 would be same as those described under the Proposed Action.	The No Action Alternative would result in no project-related impacts to environmental justice.
Hazardous Materials and Solid Waste – Sections 3.14 and 4.14		
Potential for accidental release of hazardous and toxic materials would be minimized through the implementation of Environmental Management Plan and SPCCC Plan prepared by the LCWD as part of their POD. The amount of solid wastes generated from construction and operation would not affect the life expectancy of the municipal solid waste facilities currently operating in regional area. Any hazardous materials would be disposed at an EPA-approved hazardous waste facility. Therefore, there would be no impact from the Proposed Action on existing waste facilities in the region.	Impacts from hazardous materials and solid waste under Alternative 1 would be same as those described under the Proposed Action.	There would be no project-related hazardous materials or solid waste produced under the No Action Alternative.
Paleontological Resources – Sections 3.15 and 4.15		
No known fossil paleontological resources have been identified in the vicinity of the project area; therefore, no impacts resulting from construction, operation and maintenance of the Proposed Action are anticipated. However, construction activities may result in unanticipated exposure of Holocene and late Pleistocene vertebrates or pack rat middens. If these items are discovered during construction, the BLM would be contacted, according to the SOPs in Appendix C, to determine steps necessary to evaluate the need to preserve the paleontological resources.	Impacts to paleontological resources under Alternative 1 would be the same as those described under the Proposed Action.	Under the No Action Alternative, no project-related impacts would occur to paleontological resources.

Table ES-1
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Archeological Resources and Historic Properties – Sections 3.16 and 4.16		
The Proposed Action would result in the damage or displacement of 59 isolated occurrences (primarily chipped stone artifacts) as a direct consequence of project construction. Three non-eligible NRHP properties (old Highway 93 and two diffuse prehistoric lithic scatters) could be impacted by construction. Impacts along a segment of old Highway 93 would occur only where the highway crosses the APE. There would not be any indirect effects from construction or any direct or indirect affects from operation and maintenance impacting any historic landscape or known rock art site, geoglyph or toolstone quarry eligible under Criteria a, b or c (State Protocol Agreement VII C. 2), as these sites have not been identified in the project area.	Impacts to archaeological resources and historic properties under Alternative 1 would be same as those described under the Proposed Action.	No archaeological resources or historic properties would be affected by project-related activities under the No Action Alternative.

APE – Area of Potential Effect; BLM – Bureau of Land Management; DEIS – Draft Environmental Impact Statement; EPA – U.S. Environmental Protection Agency
LCWD – Lincoln County Water District; NRHP – National Register of Historic Places; POD – Plan of Development; ROW – right-of-way
SOP – Standard Operating Procedure; SPCCC – Spill Prevention, Containment, Countermeasure, and Control; VRM – Visual Resource Management

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1.0 INTRODUCTION

1.1 GENERAL OVERVIEW

The Ely District of the Bureau of Land Management (BLM) has prepared this Final Environmental Impact Statement (EIS) in response to a right-of-way (ROW) application submitted by the Lincoln County Water District (LCWD or Applicant) to construct and operate the Kane Springs Valley Groundwater Development Project (Proposed Action). The LCWD, in cooperation with the Lincoln County Power District No. 1 (LCPD) and Lincoln County Telephone (LCT), intends to construct groundwater facilities and ancillary utility infrastructure designed to pump and convey up to 5,000 acre-feet per year (AFY) of groundwater for delivery to the northern portion of the Coyote Spring Valley. **Map 1-1** shows the general location of the project within southern Lincoln County, Nevada. Primary components of the Proposed Action are described in more detail in Chapter 2.0. The Proposed Action would include:

Water Facilities

- Groundwater production/monitoring wells (well fields)
- Water collection pipelines
- Transmission pipeline
- Terminal storage tank
- Forebay storage tank

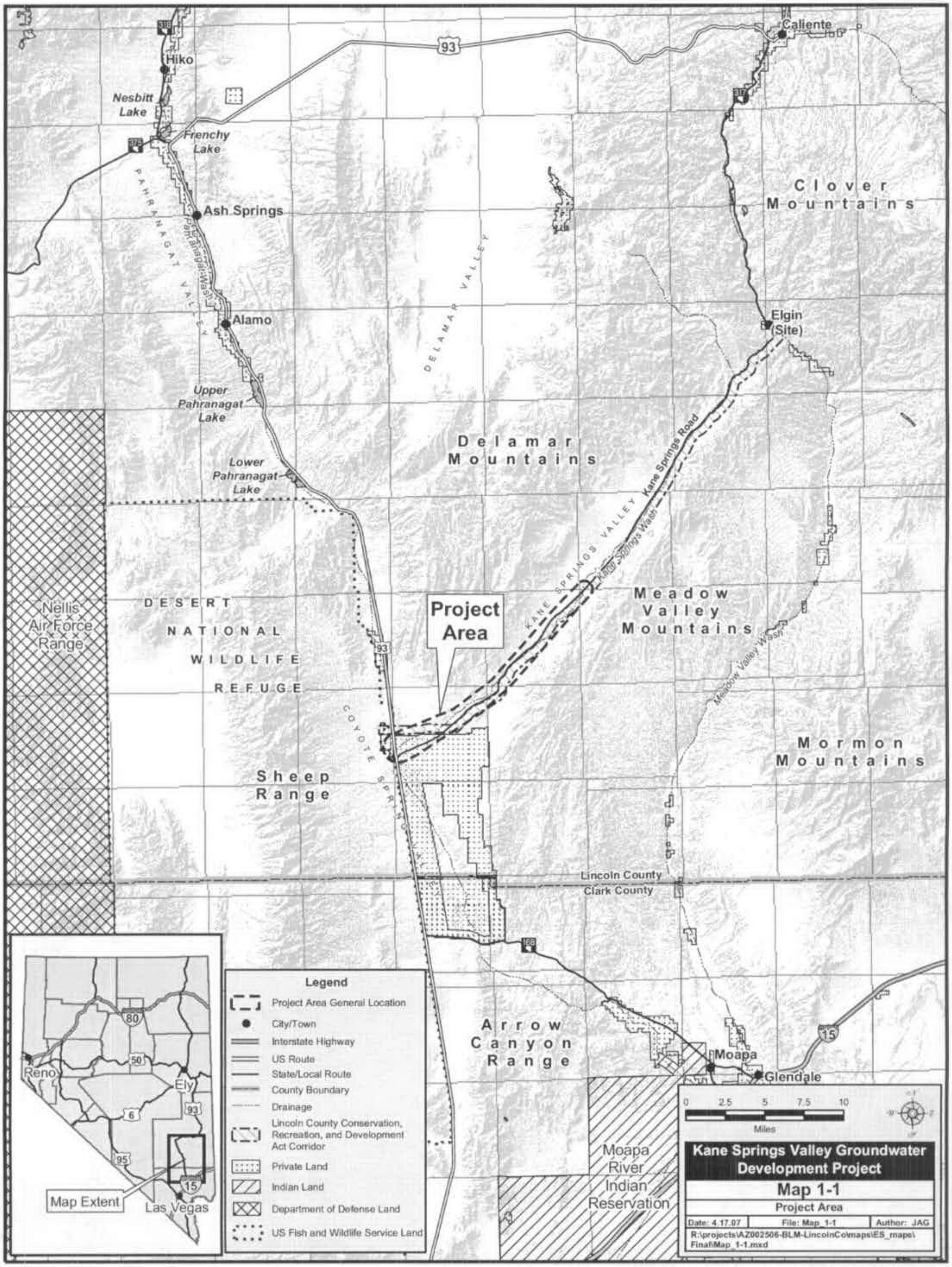
Electric Utility Facilities

- Electrical transmission/distribution lines
- Electrical substations

Communication Facilities

- Telemetry system/fiber optic lines

The LCWD currently holds groundwater rights and applications in the Kane Springs Valley Hydrographic Basin in Lincoln County, Nevada. As of February 2007, the Nevada State Engineer has granted an appropriation of 1,000 AFY to the LCWD for groundwater withdrawal from the carbonate aquifer within the Kane Springs Valley Hydrographic Basin. The LCWD has submitted four additional water rights applications to the Nevada State Engineer to pump additional groundwater from the Kane Springs Valley Hydrographic Basin. These water rights applications are still pending before the Nevada State Engineer.



Caliente
Hiko
Nesbitt Lake
Frenchy Lake
Ash Springs
Pahranagat Wash
PAHRANAGAT VALLEY
Alamo
Upper Pahranagat Lake
Lower Pahranagat Lake
DELAMAR VALLEY
Clover Mountains
Elgin (Site)
Delamar Mountains
Kane Springs Road
KANE SPRINGS VALLEY
Kane Springs Wash
Meadow Valley Mountains
Meadow Valley Wash
Nellis Air Force Range
DESERT NATIONAL WILDLIFE REFUGE
Project Area
COYOTE SPRING VALLEY
Sheep Range
Mormon Mountains
Lincoln County
Clark County
Arrow Canyon Range
Moapa
Glendale
Moapa River Indian Reservation
Reno
Ely
Las Vegas
Map Extent
Legend
Project Area General Location
City/Town
Interstate Highway
US Route
State/Local Route
County Boundary
Drainage
Lincoln County Conservation, Recreation, and Development Act Corridor
Private Land
Indian Land
Department of Defense Land
US Fish and Wildlife Service Land
0 2.5 5 7.5 10
Miles
Kane Springs Valley Groundwater Development Project
Map 1-1
Project Area
Date: 4.17.07
File: Map_1-1
Author: JAG
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The project facilities would be located in southern Lincoln County, Nevada, within or immediately adjacent to the 2,640-foot wide utility corridor established by the Lincoln County Conservation, Recreation, and Development Act under Public Law 108-424 (LCCRDA). Enacted on November 30, 2004, Title III of the LCCRDA directed the Department of Interior to use the designated corridors for ROW for the roads, wells, pipelines, and other infrastructure needed for the construction and operation of a water conveyance system in Lincoln County, subject to the requirements of the National Environmental Policy Act (NEPA).

Construction 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. Construction would begin at the southwest end of the project area (near the intersection of U.S. Highway 93 [Highway 93] and Kane Springs Road) and continue to the northeast (generally following Kane Springs Road). Construction of Phase 1 would begin upon acquisition of necessary permits, approval and grants and would occur over a 90- to 180-day period. Phase 2 and Phase 3 construction would be completed in 30 to 60 days at 1- to 3-year intervals after completion of Phase 1, and would correspond to the demand for water and the issuance of future water rights.

Multiple ROW grants may be issued based on the analysis in this EIS. The LCWD would be responsible for construction and operation of the proposed groundwater facilities subject to the terms and conditions of BLM Serial Number N79742. The LCPD and the LCT activities would be authorized under separate ROW grants. The ROWs for the water production/delivery system, electrical distribution system, and the fiber optic lines within the congressionally designated LCCRDA corridor would be issued in perpetuity pursuant to Title III of the LCCRDA.

The LCWD submitted the application for the Proposed Action to the BLM on February 9, 2005. The application was submitted to the BLM Ely District, which is the office responsible for managing the BLM-administered public lands where the Proposed Action would be developed. In late 2005, the BLM Nevada State Director established the Nevada Groundwater Projects Office to facilitate the preparation of the EIS for this Proposed Action and two similar ROW applications for groundwater development in eastern Nevada. Although the Nevada State Office is responsible for preparing the EIS, the Nevada Groundwater Projects Office staff coordinates all efforts with the Ely District staff.

The BLM, as the federal agency with responsibility to issue the ROWs, is leading the preparation of this EIS. The Council on Environmental Quality (CEQ) guidelines direct federal agencies to actively engage state, local and other federal agencies in preparation of NEPA analyses and documentation (42 United States Code [U.S.C.] §§ 4331[a], 4332[2]). The Moapa Valley Water District, National Park Service (NPS) – Lake Mead National Recreational Area, Nevada Department of Wildlife (NDOW), Nevada Department of Conservation and Natural Resources, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS) were all invited to participate as cooperating agencies in preparation of the EIS for the Proposed Action. The Moapa Valley Water District, NDOW, and USFWS accepted BLM's invitation and have signed Memorandums of Understanding outlining their responsibilities as a cooperating agency. By accepting cooperating agency status, the agencies accept obligations to contribute staff to the EIS Interdisciplinary team and develop analyses for which they have particular expertise. Although the EIS is ultimately a BLM document, the BLM agrees to use the analyses, proposals and comments of the cooperating agencies to the maximum extent possible.

1.2 PURPOSE AND NEED

The purpose of the action is to provide public land for the transport of groundwater resources by allowing for the construction of a groundwater development and conveyance system on public lands managed by the BLM. The multiple-use mission of the BLM includes managing activities such as mineral development, energy production, recreation, and grazing, while conserving natural, historical, cultural, and other resources on the public lands. The BLM's objective is to meet public needs for use authorizations such as rights-of-way, permits, leases, and easements while avoiding or minimizing adverse impacts to other resource values. The proposal to construct, operate and maintain a groundwater conveyance pipeline on public lands would be in accordance with this objective.

In order to convey the groundwater from the point of origin to the Coyote Spring Valley, the LCWD has submitted a ROW application to the BLM for the Proposed Action. The Proposed Action includes construction and operation of groundwater production wells, pipelines, pumping stations, storage facilities, telemetry facilities, telephone service and power facilities (as outlined above) that cross or occupy BLM-administered public lands.

Pursuant to Title III of the LCCRDA, Congress directed the BLM to conduct a NEPA analysis of any ROW application submitted for the construction and operation of utility infrastructure within the designated 2,640-foot LCCRDA utility corridor. This Final EIS is intended to fulfill the requirements of the NEPA by disclosing the potential environmental impacts of granting the requested ROWs for the Proposed Action and those of a reasonable range of alternatives to the Proposed Action.

The BLM will: (1) respond to the request for a ROW for the construction of a pipeline conveyance system, wells, collector pipelines, and ancillary facilities to transport groundwater resources, and (2) analyze potential impacts to affected resources.

1.3 RATIONALE FOR RIGHT-OF-WAY APPLICATION

The Applicant is seeking a ROW from the BLM for the purpose of developing and conveying goundwater that has been permitted or may be permitted to the LCWD in Kane Springs Valley for use by Lincoln County customers.

There is a need for developing sustainable water supplies as outlined in the 1999 Lincoln County Water Plan:

- To assist and support the needs of local communities in Lincoln County including Coyote Spring Valley;
- To meet the needs of future economic development within Lincoln County; and
- To produce, purchase, wholesale and transport water from sources inside and outside of Lincoln County to meet customer water needs across the region.

The purpose of the Proposed Action is to provide ROWs for the production and transportation of water resources across areas of federal land. The Proposed Action would assist in meeting a portion of the water demands of Lincoln County and is a component of Lincoln County's Water Plan. Development is underway in the adjacent Coyote Spring Valley. Currently, 16,304 AFY of groundwater has been permitted within the Coyote Spring Basin for a variety of uses. Groundwater from Kane Springs Valley would supplement these uses which include municipal, agricultural and industrial applications.

1.4 PROJECT BACKGROUND

Approximately 98 percent of Lincoln County is public land. Remaining limited private lands are available for 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.

In response to the economic downturn caused by slowing mining activities, reduction of county-based railroad operations and maintenance activities, and termination of major Department of Energy weapons development programs at the Nevada Test Site, Lincoln County has sought to diversify and expand its economy.

Historically, other jurisdictions located adjacent to Lincoln County considered importing groundwater from Lincoln County to augment their water supplies. The Board of Lincoln County Commissioners recognized that groundwater resources within the county would play a major role in economic development in their county. In 1999, Lincoln County prepared and distributed the Draft Lincoln County Water Plan for public review. Goals of the Water Plan included development of water resources both inside and outside of Lincoln County.

On June 11, 2003, Nevada's Governor signed the Lincoln County Water District Act, which established the LCWD as a political subdivision of the state (Chapter 474, Statutes of Nevada 2003). The special legislative act created a single governmental entity with the authority to serve water to all real property located within the boundaries of Lincoln County. Further, the act authorized the LCWD to sell water and water rights and to enter into agreements with private entities or corporations for the transfer or delivery of any water right or water appropriated (id at Sections 11[7], 11[11], and 11[12]).

1.5 POLICIES, PLANS, AND PROGRAMS

The following subsections provide an overview of agency authorities and responsibilities that may apply to the Proposed Action. The approval or denial of ROW authorizations for the Proposed Action by the BLM is not contingent on any of the agency actions described below. However, construction and operation of the Proposed Action, if the ROW application is approved, may not proceed until all applicable reviews, consultations and authorizations are completed.

1.5.1 Relationship to BLM Policies, Plans and Programs

The BLM Ely District is responsible for the management of approximately 11.4 million acres of land located in Lincoln, Nye and White Pine Counties in eastern Nevada (BLM 2005). The Ely

District includes three Management Areas: Egan, Schell and Caliente. The Proposed Action is located in the Caliente Management Area. The Schell and Caliente Management Framework Plans (MFPs) were approved in 1983 and 1981, respectively; and the Egan Resource Management Plan (RMP) was approved in 1987. In 1999, the BLM amended the Caliente MFP to address the management of threatened desert tortoise habitat in southern Lincoln County (Federal Register June 16, 1999, Vol. 64, No. 115).

On July 25, 2005, the BLM issued a Notice of Availability of the Draft RMP/EIS for the Ely District Office (Federal Register 05-14939, Vol. 70, No. 145, 43902-43903). Upon approval, the RMP/EIS would replace the Egan RMP, the Schell MFP (which covers the northern portion of the Ely Field District), and the amended Caliente MFP. Until that document is approved, the management of the Caliente Management Area and federal actions pertaining to the Proposed Action follow the directives in the 1999 Amended Caliente MFP.

The issuance of ROWs across BLM-administered public lands is outlined under Title V of the FLPMA. Title V states that in "designating rights-of-way corridors and in determining whether to require that ROW be confined to them, [BLM] shall take into consideration national and state land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices" (43 U.S.C. § 1763). The FLPMA further directs that "each rights-of-way permit contain terms and conditions to protect federal property and economic interests, protect lives and property, and otherwise protect the public interest in the lands traversed by the ROW or adjacent to them" (43 U.S.C. § 1765).

1.5.2 Relationship to Non-BLM Policies, Plans, and Programs

1.5.2.1 Water Rights

On February 14, 2005, the LCWD filed four applications (72218, 72219, 72220, and 72221) for a combined maximum duty of approximately 17,375 AFY with the Nevada Division of Water Resources, Office of the Nevada State Engineer (Nevada State Engineer). Applications 72218 and 72219 were timely protested by White Pine County and Wayne, Ruby and Bevan Lister; however, White Pine County withdrew its protest prior to the administrative hearing. Applications 72220 and 72221 were timely protested by the USFWS. The NPS filed timely protest on all four applications. During the public administrative hearing on the applications, the LCWD and USFWS presented a stipulation to resolve the USFWS protest.

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 water right applications that are granted. The goal of the plan is to collectively manage the development of the 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 (NWR). Although the BLM was not a party to this agreement, the USFWS concerns and requirements outlined in the stipulation are being considered in the preparation of this EIS. The Monitoring, Management and Mitigation Plan consists of four principal components:

- Monitoring Requirements: Related to production and monitoring wells, elevation control, spring flow, water quality, quality of data, and reporting.

- Management Requirements: Related to the creation and role of a Technical Review Team, the establishment of action criteria, and the details of the decision making process.

- Mitigation Requirements: Related to potential mitigation measures that could be implemented if "unreasonable adverse impacts" occur as a result of groundwater extraction associated with the Kane Springs Valley Groundwater Development Project.

- Modification of Plan: Related to procedures that would be followed to modify the Monitoring, Management, and Mitigation Plan if future changing conditions or mitigations warrant modification.

A copy of the Stipulation for Withdrawal of Protests and the Monitoring, Management and Mitigation Plan (Exhibit A) are included in **Appendix A**.

On February 2, 2007, the Nevada State Engineer issued Ruling 5712, granting a duty of 500 AFY under Application 72220, and a combined duty of 500 AFY under Applications 72218, 72219, and 72221; for a total of 1,000 AFY. A copy of Nevada State Engineer Ruling 5712 is provided in **Appendix B** and summarized in sections 3.3.3.3.1 and 4.3.1.2. The applications were granted subject to the payment of statutory permits fees and the preparation of a monitoring and mitigation plan approved by the Nevada State Engineer.

1.5.2.2 Regional Planning

While the Caliente MFP guides land use decisions and management actions on BLM-administered public lands within the Caliente Management Area (see Section 1.5.1), established policies or programs of other federal, state and local regulations or guidelines apply to the Proposed Action. Other federal plans applicable to land use in the regional area include the USFWS Desert Tortoise (Mojave Population) Recovery Plan (USFWS 1994), the Recovery Plan for the Southwestern Willow Flycatcher (USFWS 2002), and the Recovery Plan for the Rare Aquatic Species of the Muddy River Ecosystem (USFWS 1995b). There is no habitat for the southwestern willow flycatcher within the project area. However, suitable habitat for this species does occur in the Meadow Valley Wash, located approximately 20 miles east of the northernmost extent of the project area; the south end of the Upper Pahranagat Lake area, approximately 24 miles northwest of the project area; and the Muddy River area, approximately 28 miles south of the project area (NDOW 2006). These species are described in greater detail in Section 3.5 - Wildlife Resources.

The BLM, in cooperation with the USFWS and the U.S. Department of Defense, is preparing a Programmatic EIS to evaluate issues associated with the designation of energy corridors on federal lands in 11 western states including Nevada. Based on the information and analyses developed in the Programmatic EIS, each agency would amend its respective land use plans by designating a series of energy corridors. Designated utility corridors within the project area include the 2,640-foot wide LCCRDA corridor and the approved Southwest Inter-tie corridor west of Highway 93.

A Draft Multiple Species Habitat Conservation Plan (MSHCP) has been prepared for Coyote Spring Investment (CSI) development activities in southern Lincoln County. The USFWS has prepared a Draft EIS regarding the Draft MSHCP and the issuance of an incidental take permit to take endangered and threatened species in accordance with Section 10(a) of the ESA of 1973, as amended (Federal Register November 2, 2007, Vol. 72, No. 212). The Draft EIS and Draft MSHCP are available for public review and comment until January 2, 2008. The earliest the Final CSI MSHCP and USFWS EIS are anticipated to be completed is March 2008. A separate Habitat Conservation Plan and EIS addressing the southeastern portion of Lincoln County are currently under development and expected to be final by spring 2008. The Clark County MSHCP covers development activities on private lands in Clark County (Federal Register September 22, 2000, Vol. 65, No. 185).

Local regulations and guidelines that guide development activities on private lands within the project area include:

- *Lincoln County Water Plan* (Resource Concept, Inc. 2001)
- *2005 Annual Report Lincoln County Comprehensive Economic Development Strategy*, (Board of Lincoln County Commissioners 2006)
- *Lincoln County Master Plan,* adopted December 2006 (Lincoln County Planning Commission 2006)
- *Coyote Springs – Lincoln County General Improvement District Service Plan* (CSI 2005)
- *Clark County - Coyote Springs Water Resources General Improvement District Service Plan* (CSI 2006)

Prior to construction, the Applicant would need to obtain other permits and approvals from federal, state and local agencies with respect to their jurisdictions. Other potential permits and approvals are discussed in Section 1.8.

1.5.3 Public Controversy

Groundwater pumping in Nevada is a highly controversial subject. There are differing viewpoints in the scientific literature and among various federal, state, and local land management and regulatory agencies. The BLM acknowledges that areas of controversy exist regarding the Proposed Action and the analyses in this Final EIS. Many of these are not resolvable because they reflect either differing points of view or irreducible uncertainties in predicting the future. However, the BLM has considered these areas in the development of this Final EIS.

Jurisdiction of Groundwater Allocation

There is a common misconception concerning the jurisdiction of the Nevada State Engineer and the BLM with respect to the appropriation of water rights in Nevada. Although the BLM has the authority and responsibility to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generation (in this case by coordinating with agencies and water rights applicants to protect the federal land resources), it is the responsibility of the Office of the Nevada State Engineer to award or deny water rights applications and thus ensure efficient long-term sustainable use of groundwater resources.

The BLM does not have the authority to require the Applicant to have a backup water source in the event that the amount of groundwater allocated by the Nevada State Engineer is not sustainable or additional water is necessary but unavailable. It is the BLM's responsibility to issue or deny the ROW grant for the Proposed Action.

Existing Groundwater Data

Disagreement exists regarding the ability to predict the perennial yield in the hydrographic basins and potential impacts to springs and surface water. Perennial yield is defined as the amount of usable water from a groundwater aquifer that can be economically withdrawn and consumed each year for an indefinite period of time. It cannot exceed the natural recharge to that aquifer and ultimately is limited to the maximum amount of discharge that can be utilized for beneficial use. Uncertainties associated with the existing data in the Region of Influence have resulted in different opinions among hydrogeologists in predicting the amount of water available for beneficial use, and raise questions about the capability to reliably predict potential impacts of groundwater pumping on surface water resources.

The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. There is, however, a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved.

Alternatives Development

Pursuant to CEQ regulation section 1502.14, the EIS should present reasonable alternatives within and outside the BLM's jurisdiction. Actions connected to the Proposed Action but outside the BLM jurisdiction include the location of groundwater diversions and amount of groundwater permitted by the Nevada State Engineer; groundwater monitoring and management agreements between the Applicant and the Nevada State Engineer; and wildlife and groundwater monitoring, management, and mitigation agreements between the Applicant and the USFWS.

The Applicant's Proposed Action is to obtain a ROW from the BLM for the purpose of developing and conveying up to 5,000 AFY of groundwater from the Kane Springs Valley Hydrographic Basin for use by Lincoln County customers. The Applicant applied to the BLM for a ROW to construct and operate the proposed project facilities on BLM lands; therefore, the alternatives were developed based on alternative routes for the infrastructure, and not on pumping scenarios that are under the jurisdiction of the Nevada State Engineer.

1.6 SCOPING

The NEPA is designed to ensure that the environmental consequences of major federal decisions are known and available to public officials and the public before decisions are made and actions are undertaken. Public scoping assists in the environmental review process by providing a means to inform the public about activities that involve a federal action and solicit their comments regarding issues and alternatives which the BLM should consider addressing in the EIS. The BLM considered comments received through public scoping when developing the scope of issues and alternatives to be analyzed in this EIS.

A Notice of Intent (NOI) to prepare the EIS was published in the Federal Register (Volume 71, No. 62) on March 31, 2006. The notice encouraged the public and other federal, state, local and Tribal governments to assist the BLM in identifying issues and alternatives to be considered by the BLM for evaluation in the EIS. A 30-day public scoping period (March 31, 2006 through May 1, 2006) was provided for submission of comments.

The BLM distributed press releases announcing the dates, locations and times of scoping meetings to local and regional print and broadcast media. Paid legal notices indicating the dates, locations and times of scoping meetings were published in the local newspapers circulated in Reno, Las Vegas, Baker, Caliente, Alamo and Mesquite, Nevada. The BLM held six open house meetings between April 11, 2006 and April 18, 2006. A summary report of scoping comments received during the scoping period is provided in the Kane Springs Valley Groundwater Development Project EIS Scoping Report (BLM 2006d). A copy of this report is available for review/download at the BLM Nevada State Office website located at www.nv.blm.gov.

Based on comments received during the scoping process, the following general categories of issues were identified as summarized below.

- ***NEPA Process*** – Eighty-six comments were received specific to the NEPA process; particularly, how closely the EIS would follow the NEPA process.
- ***Social Resources*** – Fifty-one comments were received specific to concerns about impacts on the human or built environment. Scoping comments were provided on the following resources: 1) Visual Resources; 2) Noise; 3) Land Use (including Transportation, Mineral Resources and Range Resources); 4) Areas of Critical Environmental Concern, Wilderness and Other Special Use Areas; 5) Recreation; 6) Socioeconomic Resources; 7) Solid Waste and Hazardous Materials; 8) Environmental Justice; 9) Paleontology; and 10) Archeological Resources and Historic Properties.
- ***Physical and Biological Resources*** – Ninety comments were received specific to concerns about impacts on components of the physical environment. Scoping comments were provided on the following resources: 1) Air Quality; 2) Biological Resources (including Endangered, Threatened, Proposed and Candidate Species, Fisheries, Migratory Birds, Vegetation, Noxious Weeds and Wetlands/Riparian Habitat); 3) Geologic Resources; 4) Soil Resources; and 5) Water Resources.

1.7 ORGANIZATION OF THE FINAL EIS

In response to public comment on the Draft EIS, as well as new information obtained since the release of the Draft EIS, the BLM has made a number of changes to the Final EIS. The most important substantive changes are listed below. Editorial and grammatical changes to improve accuracy, clarity, consistency, and improved readability have been made to the Final EIS based on public comment and internal review.

- Modification of the LCPDs electrical system between the proposed Emrys Jones Substation to each of the proposed wells sites changed from a 69 kilovolt (kV) transmission line with

22.8 kV underbuild to a 138 kV transmission line with 22.8 kV underbuild. This line would initially be energized at 25 kV class distribution providing service to each of the proposed well sites through individual step-down substations. Changes from the Draft EIS to Final EIS are reflected in the Executive Summary; Chapter 1; and Chapter 2 - Description of the Electrical Utility Facilities; and Map ES 1-1, Map 2-1; and Figure 2-7. The direct, indirect, and cumulative effects of this change were considered in Chapter 4 – Environmental Consequences.

- To improve clarity regarding the role of the BLM and the Office of the Nevada State Engineers in developing groundwater resources on BLM-administered public lands in Nevada, a "Public Controversy" section has been added to the Executive Summary (ES-1.2.2) and Chapter 1 (1.4.3).

- The Nevada State Engineer Ruling 5712 has been summarized in Chapter 3 (3.3.3.3) and Chapter 4 (4.3.1.2).

- An "Assumptions for Analysis" section has been added to the beginning of Chapter 4. This section describes assumptions made by the BLM for analyzing effects of the Proposed Action on the human and natural environment.

- An "Incomplete and Unavailable Information" section has been added to the beginning of Chapter 4.

- Through consultation with the USFWS, the BLM has revised language regarding potential effects of the Proposed Action on the Moapa dace, desert tortoise, and southwestern willow flycatcher. These edits are in response to the agencies uncertainty regarding indirect effects of the Proposed Action on spring flows in the Muddy River system. The Stipulation Agreement between the USFWS and the LCWD/Vidler includes measures to mitigate unreasonable adverse impacts from the Proposed Action on the Muddy River system.

- A discussion on global climate changes and its effect on the regional area have been added to Chapter 4 – Cumulative Impacts (4.20.3.1).

- Table 4-8 has been added to Chapter 4 (4.20.4.4). The table includes acreage of desert tortoise habitat likely to be disturbed from cumulative actions within the Mormon Mesa Critical Habitat Unit (Cumulative Resources Analysis Area for Desert Tortoise).

- The Weed Risk Assessment for the project area has been added to Appendix E-5.

- Comments on the Draft EIS and BLM's responses to the comments appear in Appendix F.

The following sections describe the organization of the remaining components of the Final EIS. Changes to specific chapters in the Draft EIS to the Final EIS are described above.

1.7.1 Chapter 2.0 – Proposed Action and Alternatives

Chapter 2.0 describes the Proposed Action and Alternatives including the No Action Alternative.

Alternatives that were considered but eliminated from further analysis are described in Chapter 2.0, Section 2.4 - Alternatives Considered during Scoping but Eliminated from Further Consideration with a discussion of why they were not considered further.

1.7.2 Chapter 3.0 - Affected Environment

The existing environment that could be affected by granting the ROWs for the Proposed Action is described in Chapter 3.0 of the EIS. The existing environment includes the social and natural environment. The baseline environmental information provides the basis for analyzing impacts of the Proposed Action and alternatives.

1.7.3 Chapter 4.0 – Environmental Consequences

Chapter 4.0 describes the possible environmental consequences of the Proposed Action and alternatives. Direct, indirect and cumulative effects of the Proposed Action and alternatives are assessed and described in order to allow for comparative impact evaluation. Impacts are compared to the social and natural environment that would be expected to exist if no action were taken (the No Action Alternative).

1.7.4 Chapter 5.0 – Consultation and Coordination

Chapter 5.0 describes public participation undertaken to date, and additional opportunities that would occur, throughout the EIS process. It also lists agencies and organizations that received copies of the EIS for review, and lists the preparers of the document.

1.7.5 Chapter 6.0 – References, Abbreviations and Acronyms, Glossary, and Index

Chapter 6.0 includes a list of references used in the preparation of the EIS. Other sections that follow include a list of abbreviations and acronyms and a glossary of technical terms used.

1.8 APPLICABLE LAWS, REGULATIONS, AUTHORIZING ACTIONS AND PERMITS

The EIS was prepared in compliance with the CEQ regulations for implementing NEPA (40 CFR § 1500-1508); the BLM NEPA Handbook, H-1790-1; the Ely District Office Environmental Analysis Guidebook; FLPMA Sections 201, 202 and 206 (43 CFR § 1600); and the BLM Land Use Planning Handbook (BLM Handbook H-1601-1). The BLM also has Instruction Memorandums (IM 2004-105, 149, 231, and 2005-105) which guide and set policy for the BLM compliance with the NEPA.

Table 1-1 lists federal and state laws and regulations that may apply to the Proposed Action. The Applicant and its contractors would comply with requirements set forth in these directives as applicable.

Table 1-1
Laws, Regulations and Executive Orders that May Apply to the Proposed Action

FEDERAL
Administrative Procedures Act, Title 5 U.S.C. Chapter 5, Sections 511-599
Federal Land Policy and Management Act of 1976 43 U.S.C.1701 et seq.
National Historic Preservation Act and regulations implementing the National Historic Preservation Act 16 U.S.C.470 et seq.
Archeological Resources Protection Act of 1978, as amended, 42 U.S.C.1996 and 1996a
Clean Water Act of 1987, as amended, 33 U.S.C.1251 et seq.
Clean Air Act of 1990, as amended, 42 U.S.C.7401 et seq.
Protection and Enhancement of the Cultural Environment Executive Order 11593
Endangered Species Act of 1973, as amended, 16 U.S.C.1531 et seq.
Native American Graves Protection and Repatriation Act of 1990, as amended, 25 U.S.C.3001 et seq.
Noise Control Act of 1972, as amended 42 U.S.C.4901 et seq.
Occupational Safety and Health Act 29 U.S.C.651 et seq. (1970)
Pollution Prevention Act of 1990 42 U.S.C.13101 et seq.
Safe Drinking Water Act, as amended, 42 U.S.C. § 300f et seq. (1974)
Safe Drinking Water Act, as amended, 42 U.S.C.201 et seq.
Migratory Bird Treaty Act (Migratory Bird Guidance) 16 U.S.C.703–711 Executive Order January 1, 2001
National Environmental Policy Act, Protection and Enhancement of Environmental Quality - Executive Order 11512
Section 110 of the National Historic Preservation Act (1980, amended 1992)
Floodplain Management Executive Order 11988
Protection of Wetlands Executive Order 11990
Federal Compliance with Pollution Control Standards Executive Order 12088
Environmental Justice Executive Order 12898
Indian Sacred Sites Executive Order 13007
American Indian Religious Freedom Act of 1978 (42 U.S.C.1996)
Consultation and Coordination with Indian Tribal Governments Executive Order 13084
Invasive Species Executive Order 13112
Exotic Organisms – Executive Order 11987
Responsibilities and the ESA, Secretarial Order 3206 (June 5, 1997)
Federal Water Pollution Control Act, as amended, 33 U.S.C.1323 et seq.
Wild and Scenic Rivers Act, as amended, 16 U.S.C.1271 et seq.
Wilderness Act, as amended, 16 U.S.C.1131 et seq.
Recreation and Public Purposes Act of 1926, as amended, 43 U.S.C.869 et seq.
Mineral Leasing Act of 1920, as amended, 30 U.S.C.181 et seq.
Mining and Mineral Policy Act of 1970, as amended, 30 U.S.C.21 (a)
Taylor Grazing Act of 1934, as amended, 43 U.S.C 315 et seq.
Public Rangelands Improvements Act of 1978, 43 U.S.C.1901
Wild and Free-Roaming Horse and Burro Act, as amended, 16 U.S.C.1331-1340
Migratory Bird Conservation Act of 1979, as amended, 16 U.S.C.715 et seq.
Energy Policy and Conservation Act Reauthorization of 2000, as amended, Public Law 106-469.
Energy Policy and Conservation Act Report.
Executive Orders 11644 and 11989 (Off-Road Vehicles)
Executive Orders 13045 (Protection of Children from Environmental Health Risks and Safety Risks)
Executive Orders 12144 (Environmental Effects Abroad of Major Federal Actions)
Executive Orders 13212 (Actions to Expedite Energy Related Projects)
Secretarial Order 3175 (incorporated into the Departmental Manual at 512 DM 2)
STATE
State Protocol Agreement VII C.2 (State Protocol Agreement between the BLM, Nevada and the Nevada SHPO)
Chapter 474, State of Nevada 2003 (County Fire Protection Districts)
Nevada State Engineer Ruling 5712 (2007) (Kane Springs Valley Project)

Table 1-1 Laws, Regulations and Executive Orders that May Apply to the Proposed Action
NRS Chapters 501 through 506 (Wildlife – Administration and Enforcement; Licenses, Tags, and Permits; Hunting, Fishing, and Trapping; Management and Propagation; Fur Dealers; and Wildlife Violator Compact)
NRS Chapters 527 and 528 (Forestry; Forest Products and Flora – Protection and Preservation of Timbered Lands, Trees, and Flora; Forest Practice and Reforestation)
NRS 527.060-120 (Protection and Preservation of Timbered Lands, Trees, and Flora – Definitions of Cactus and Yucca)
NRS 527.270 (List of species declared to be threatened with extinction; special permit required for removal or destruction)
NRS 533.030 (Adjudication of Vested Water Rights; Appropriation of Public Waters - Appropriation for beneficial use; use for recreational purpose declared beneficial; limitations and exceptions)
NRS 533.035 (Adjudication of Vested Water Rights; Appropriation of Public Waters - Beneficial use: Basis, measure and limit of right to use)
NRS 534.020 (Underground waters belong to public and are subject to appropriation for beneficial use; declaration of legislative intent).
NRS 555.005 (Agriculture – Control of Insects, Pests, and Noxious Weeds, Definitions)
NAC Chapters 527 and 528 (Administrative Code for NRS 527 through 528)
NAC Chapters 501 through 505 (Administrative Code for NRS 501 through 505)
NAC 445A – 445A.225 (Water control definitions and standards)
NAC 444.571 (Class II disposal site definition)
NAC 445A.226 (Actions for contaminated sites)
U.S.C – United States Code NRS – Nevada Revised Statutes NAC – Nevada Administrative Code et seq. – "and the following"

1.8.1 Air and Water Resources

The Nevada Division of Environmental Protection (NDEP) regulates air and water quality in the State of Nevada in cooperation with the U.S. Environmental Protection Agency (EPA). Prior to project construction, the LCWD or its contractor would be responsible for obtaining an approved Surface Area Disturbance – Air Quality Permit from the NDEP – Bureau of Air Pollution Control. The contractor would be required to implement a Dust Control Plan during project construction. The LCWD has prepared a Dust Control Plan that describes measures the LCWD and its construction and reclamation contractors would implement during project construction in accordance with local regulations (LCWD 2007).

The NDEP also controls the discharge of storm waters associated with temporary construction activities through a National Pollutant Discharge Elimination System (NPDES) Notice of Intent Permit and the requirement that all activities be conducted in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The NDEP also issues NPDES permits for pipeline construction activities that involve discharge to the Waters of the United States, as classified by the Clean Water Act and its amendments, during hydrostatic testing.

The LCWD has prepared a SWPPP that addresses activities related to construction and reclamation of the Proposed Action (LCWD 2007).

The Nevada Division of Water Resources is responsible for administering and enforcing Nevada water law, which includes the permitting, adjudication, and appropriation of groundwater and surface water in the state. All water within the boundaries of the state, whether above or beneath the surface of the ground, is subject to appropriation for beneficial use under the laws of the state (Nevada Revised Statutes [NRS] 533.030 and NRS 534.020). Beneficial use is the basis, the measure, and the limit of the right to use water. In Nevada, beneficial uses are determined on a case-by-case basis. The general groundwater policy of the Nevada State Engineer is to limit water withdrawals from a basin to the average annual recharge for that basin. However, in basins where an outside source of supply is assured, the State Engineer may allow withdrawals in excess of the annual recharge. Each right to appropriate groundwater in the State of Nevada carries with it the right to make a reasonable lowering of the static groundwater level at the appropriator's point of diversion (NRS 534.110(4)). The Nevada State Engineer may allow, at his discretion, the groundwater level to be lowered at the point of diversion of a prior appropriator with the provisions that rights of holders of existing appropriations can be satisfied under such express conditions (NRS 534.110(5)).

The Coyote Spring – Lincoln County General Improvement District (GID), and the Clark County – Coyote Spring Water Resources GID, both political subdivisions of the State of Nevada, are mandated under law to provide water treatment (NRS 318.144) and sanitary sewer facilities (NRS 318.140) to those portions of the Coyote Spring development area within their respective territories. If either Coyote Spring – Lincoln County GID or Clark County – Coyote Spring Water Resources GID determines that water provided from the well field requires treatment, a water treatment facility may be constructed on private lands near the proposed terminal storage tank. The Coyote Spring – Lincoln County GID and the Clark County – Coyote Spring Water Resources GID would be responsible for wastewater treatment, storage and disposal facilities in the Coyote Spring Valley area. Coyote Spring developers would be responsible for the treated effluent reuse system. Construction of these facilities would correspond to the phased construction envisioned for the development of the Coyote Spring community. The NDEP and the Nevada State Health Department would regulate these facilities subject to Nevada Administrative Code (NAC) Chapter 445A. Also, the NDEP would regulate the use of treated effluent. Other actions associated with the Coyote Spring development are discussed in Section 4.20 – Cumulative Impacts.

1.8.2 Fish and Wildlife Resources Including Threatened, Endangered, Candidate and Special Status Species

Special status species include those declared as Threatened or Endangered under the federal ESA of 1973, as amended; candidate species proposed for listing under the ESA; or species of concern or otherwise identified by the USFWS, BLM, or State of Nevada as unique or rare. Threatened, Endangered and species proposed for listing under the ESA are protected by the ESA. Candidate species have no protection under the ESA. However, the BLM policy requires that actions authorized, funded or carried out by the agency would not jeopardize the continued existence of any Threatened or Endangered species, contribute to the listing of any candidate species as Threatened or Endangered, or result in the destruction or adverse modification of habitat which is determined by the Secretary of the Interior as critical to such species.

Under Section 7 of the ESA, the BLM is required to consult with the USFWS on actions that it permits, licenses, funds or otherwise authorizes, in whole or in part, to ensure that these actions would not jeopardize the continued existence of any listed species. The BLM also must confer with the USFWS on any agency action when an action may affect a Threatened or Endangered species or result in adverse modification of critical habitat as designated by the USFWS.

As part of the Section 7 process, the BLM prepares a Biological Assessment to comply with the ESA, and USFWS issues a Biological Opinion deciding whether the Proposed Action would jeopardize the continued existence of any species listed or proposed for listing as Threatened or Endangered under the ESA, and whether the Proposed Action would result in adverse modification of designated or proposed critical habitat. The BLM has prepared a Biological Assessment for the Proposed Action and will continue to coordinate with the USFWS throughout the EIS process. The Biological Opinion is expected to be published by February 10, 2008.

In Nevada, "sensitive" species are defined as those plant and animal species identified by the BLM as species for which population viability is a concern, as evidenced by (1) a significant current or predicted downward trend in population numbers or density or (2) a significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution.

Conservation management and special protections for flora and fauna are provided mainly by state and federal laws, regulations and policies, with management carried out by authorized agencies. The State of Nevada provides for and authorizes conservation management and protection for a great number of species under NRS Chapters 501 through 506, NAC Chapters 501 through 505, NRS Chapters 525 and 528, and NAC Chapters 527 and 528.

The state's wildlife and wild land plants are administered by the NDOW and the Nevada Division of Forestry, respectively. Mule deer, bighorn sheep, mountain lion, cottontail rabbit, chukar, Gambel's quail and mourning dove are among wildlife classified as game species; whereas bobcat, kit fox and gray fox are among those classified as fur-bearing species. In general, management methods and intensities are based on a sustainable population principal with protection enforced against illegal harvest. Wild land plants, notably coniferous species, are similarly managed by the Nevada Department of Forestry. However, because of the vulnerability of certain wildlife and flora to decline, special management status and protections may be asserted. Under NRS chapter 501, wildlife may be classified as protected with further classifications of sensitive, Threatened or Endangered as warranted.

Similarly, under NRS 527.270, native plants may be declared as threatened with extinction and protected. By nature, authorities to manage plant and animals overlap between the state and federal natural resource management agencies.

The NDOW establishes population objectives for various species. The BLM confers with the NDOW on proposed projects that would have an effect on wildlife or fisheries. The USFWS and the NDOW are cooperating agencies with the BLM in the preparation of this EIS.

1.8.3 Waters of the United States, Wetlands and Floodplains

The requested ROW crosses 11 ephemeral drainages including four crossings of the Kane Springs Wash. All drainages are tributaries to the Kane Springs Wash. These drainages are normally dry and only flow during periods of heavy rainfall, most often associated with summer thunderstorms. Construction activities in these washes would require consultation with the Army Corps of Engineers. The St. George, Utah Regulatory Office is the delegated office responsible for implementing and enforcing Section 404 of the federal Clean Water Act (33 CFR parts 320 to 330). Formal jurisdictional wetland delineation has not been conducted.

1.8.4 Heritage Resources

The BLM consults with the Nevada State Historic Preservation Office (SHPO) and other interested parties, as necessary, regarding potential impacts of the proposed undertaking on archeological resources and historic properties.

Collection of vertebrate fossils on public lands requires a permit issued by the BLM (43 CFR 8365). Invertebrates and fossil plants (including petrified wood and pollen) may be collected without a permit except in specially designated areas. Invertebrates may be collected from public lands without a permit in reasonable quantities for personal enjoyment, not for barter, sale or exchange.

Section 106 of the National Historic Preservation Act (NHPA; 16 U.S.C 470f) requires the BLM to take into account the effects of "undertakings" on sites, districts, buildings, structures and objects eligible for or included in the National Register of Historic Places (NRHP). The regulations require the BLM official to avoid effects where prudent and feasible. When the federal official determines that an undertaking would have an effect on an NRHP property, it is required to provide an opportunity for the SHPO to comment before the undertaking is allowed to proceed. The Nevada BLM/SHPO Protocol Agreement guides the process for assuring consultation between the BLM and the SHPO. The BLM has conducted a Class III (intensive) survey to identify archaeological resources and properties that would be affected by the Proposed Action. The Class III Survey Report has been submitted to the SHPO.

Section 110 of NHPA (16 U.S.C 470 h-2) requires federal agencies to establish a program for the identification, evaluation and nomination of significant sites, districts, buildings, structures and objects under the jurisdiction and control of such agency to the NRHP. NRHP properties must be managed and maintained in a way that considers the preservation of their historic, archaeological, architectural and cultural values. This section of NHPA incorporates the provisions of Executive Order 11593 into law.

The Archaeological Resources Protection Act (16 U.S.C 470aa et seq.) prohibits excavation, removal, damage, alteration or defacement of archeological resources without a permit. The Archaeological Resources Protection Act (16 U.S.C 470ii) also requires agencies to inventory the nature and extent of archaeological resources on public and Indian lands. Further, the Act (as amended Public Law 100-588) also requires federal agencies to establish a program to increase public awareness of the significance of archaeological resources located on public and Indian lands and the need to protect such resources.

1.8.5 Tribal Consultations

Executive Order 13084 directs federal agencies to consult with modern American Indian Tribal representatives who may have concerns about issues that affect Tribal self-government, trust resources, and Indian Tribal treaty and other rights. The BLM is conducting government-to-government consultation with interested Tribes to provide information on the Proposed Action and alternatives and to obtain information on cultural resources and Native American practices/beliefs which may be affected by the Proposed Action and alternatives.

Executive Order 13084 requires federal officials to recognize the domestic dependent sovereign status of federally recognized Indian Tribes and coordinate with Tribes on any activities which may have an impact on Tribal interests. The American Indian Religious Freedom Act ([AIRFA] 42 U.S.C 1996) reinforces the constitutional right of free practice of religion. The AIRFA reminds federal officials to consider impacts of federal actions on the free practice of Indian religions.

Executive Order 12898 reinforces AIRFA by directing federal land managers to specifically take into account and document that federal actions do not damage sacred sites.

The Native American Graves Protection and Repatriation Act ([NAGPRA]43 CFR Part 10) requires federal officials to consult with American Indian individuals, Tribal organizations and recognized Tribal governments with demonstrated affinity to human remains, funerary objects, sacred objects and objects of cultural patrimony when federal actions may disturb these features.

1.8.6 Highways

The U.S. Department of Transportation, Federal Highway Administration, and Nevada Department of Transportation (NDOT) recognize it is in the public interest for utility facilities to use the ROWs of public roads and streets when such use does not interfere with the primary purpose of the ROW for transportation (23 CFR part 645).

The state highway department is responsible for preserving such ROWs free of all public and private installations, facilities or encroachments except under other approved use or occupancy. Any traffic disruptions along Highway 93 during project construction would require notification of the NDOT.

1.8.7 Authorizing Actions and Permits

Table 1-2 lists federal, state, county and other permits and approvals that may be needed to implement the Proposed Action or other action alternatives.

1.9 INTERRELATED PROJECTS

CEQ guidelines for the EIS preparation require that cumulative impacts be addressed in addition to direct and indirect impacts. Cumulative impacts are those incremental impacts that would result from the effects of the Proposed Action or action alternatives when added to the effects of other past, present and reasonably foreseeable projects.

The BLM has identified 14 interrelated projects whose effects on individual resources potentially impacted by the Proposed Action or action alternatives may be cumulative in nature. Cumulative impacts may potentially extend across a broad range of the resource categories being assessed in this document. Each project has been evaluated to determine if it is sufficiently defined (reasonably foreseeable) to be: 1) relevant to potential impacts, 2) within the project area of influence, and 3) of a magnitude that could potentially result in a cumulative impact. Cumulative effects and descriptions of each of these projects are presented in Section 4.20 - Cumulative Impacts.

- Lincoln County Conservation, Recreation, and Development Act (LCCRDA)
- CSI Development – Lincoln County
- CSI Development – Clark County
- LS Power Electric Transmission Project (LS Power)
- Coyote Spring 138 kV Transmission Line Project
- Ely Energy Center Project (500 kV transmission line in the LCCRDA corridor)
- Coyote Spring Well and Moapa Transmission System Project
- Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project
- Toquop Energy Project
- Additional Moapa Valley Water District Groundwater Pumping in Upper Moapa Valley
- Clark, Lincoln, and White Pine Counties Groundwater Development Project
- Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights
- Alamo Industrial Park and Community Expansion Land Sale
- Build-Out of the Lincoln County Land Act Area (Toquop Township Planning Area)

Table 1-2
Authorizations, Permits, Reviews and Approvals

Actions Requiring Permit, Approval or Review	Permit/Approval	Accepting Authority/ Approving Agency
Federal		
ROW over BLM-administered Public Lands	FLPMA and Title III of the LCCRDA	BLM
NEPA Compliance to Grant ROW	Environmental Impact Statement	BLM
Grant of ROW by the BLM	National Historic Preservation Act, Compliance with Section 106	BLM and SHPO
Grant of ROW by the BLM	Endangered Species Act Compliance (Section 7 Consultation on public lands and Section 10 Consultation on private land); the BLM and USFWS, Biological Assessment, Biological Opinion	USFWS
Dry Wash Crossings	Clean Water Act, Section 401/404	Army Corps of Engineers
State of Nevada		
Water Appropriation, Importation, Monitoring and Mitigation	Water Appropriation Permits	Nevada State Engineer
Notice of Intent to Drill or Abandon a Well	Well Drilling Permits	Nevada Department of Water Resources
Critically Endangered Plant Species; Native Cacti and Yucca Commercial Salvaging and Transportation Permit	Collection Permit for State-Listed Plants	Nevada Division of Forestry
Wildlife and Habitat Consultation for Disturbance on the BLM Land	Authorization for take or removal of state-protected reptiles	NDOW
Desert Tortoise Handling Permit/Authorization	Handling Authorization	NDOW
Notification for Stormwater Management during Construction and Operation; Temporary Groundwater Discharge	SWPPP, Section 401 Water Quality Certification; Section 402 NPDES Notification; Temporary Discharge Permit	NDEP
Construction / Fugitive Dust – PM_{10}	Surface Area Disturbance – Air Quality Permit	NDEP
Certificate for New Water Utility	Utilities Environmental Protection Act Construction Permit	Public Utilities Commission of Nevada
Encroachment of U.S. Highway 93	Encroachment Permit	Nevada Department of Transportation
Local		
Construction and Operation of the Proposed Action	Special Use and Construction Permits; Grading Permits for Project Components on the BLM lands	Lincoln County

BLM – Bureau of Land Management
NDOW – Nevada Division of Wildlife
NPDES – Natioanl Pollution Discharge Elimination System
ROW – right-of-way
SWPPP – Storm Water Pollution Prevention Plan
LCCRDA – Lincoln County Conservation, Recreation, and Development Act
NDEP – Nevada Department of Environmental Protection
NEPA – National Environmental Policy Act
PM_{10} – particulate matter less than 10 microns
SHPO – State Historic Preservation Office
USFWS – U.S. Fish and Wildlife Service

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action (Section 2.1) and two alternatives which consist of Alternative 1 (Section 2.2) and the No Action Alternative (Section 2.3). Several other alternatives were considered, but were eliminated from detailed analysis. These alternatives are also briefly described (Section 2.4). Pursuant to the CEQ regulation section 1502.14, the EIS should present reasonable alternatives within and outside the BLM's jurisdiction. Actions connected to the Proposed Action but outside the BLM jurisdiction include the location of groundwater diversions and amount of groundwater permitted by the Nevada State Engineer, groundwater monitoring and management agreements between the Applicant and the Nevada State Engineer, and wildlife and groundwater monitoring, management, and mitigation agreements between the Applicant and the USFWS. Although the BLM is not a party to these agreements, the BLM has, and will continue to work closely with these agencies to ensure the Proposed Action is compatible with the regulatory requirements and jurisdictional responsibilities of each agency.

2.1 PROPOSED ACTION

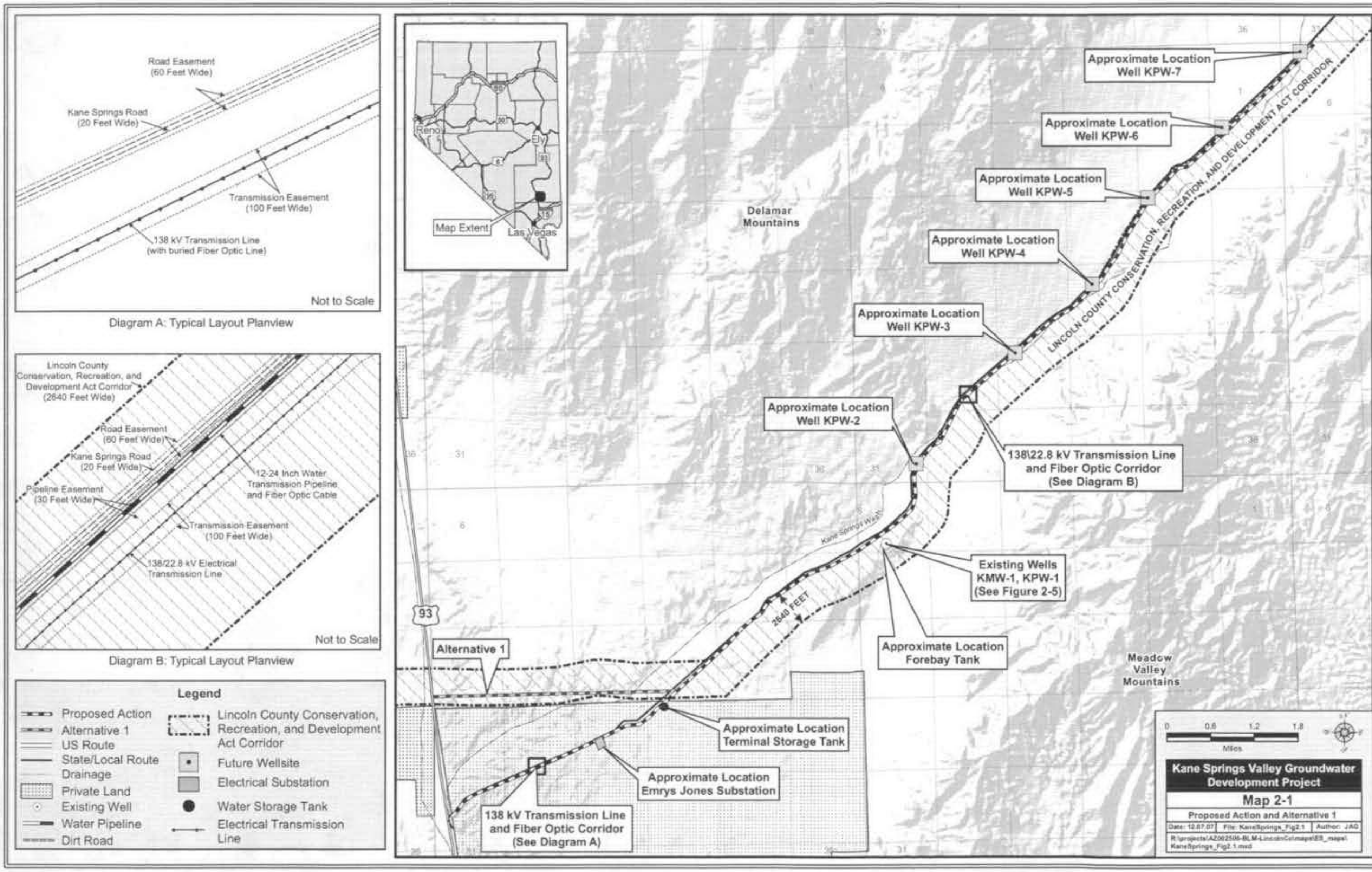
The LCWD (Applicant), in cooperation with the LCPD and the LCT, is proposing to construct infrastructure required to pump and convey groundwater from the Kane Springs Valley Hydrographic Basin to the LCWD Service Territory in the Coyote Spring Valley in southern Lincoln County. Most of the proposed facilities would be located along or near the Kane Springs Road ROW, within the 2,640-foot wide LCCRDA utility corridor. A production well (referred to as KPW-1) and monitoring well (referred to as KMW-1) were constructed in 2005 under a separate ROW application - BLM Serial Number NVN-079630. The monitoring well was constructed to assist with the hydrogeology assessment of the Kane Springs Valley Hydrographic Basin and to obtain data to support the drilling of water production wells. The two wells are located next to each other, south of Kane Springs Road, approximately 7 miles northeast of Highway 93. **Map 2-1** illustrates the approximate location of existing and proposed facilities based on land ownership.

2.1.1 Facility Components and Design

The LCWD would be responsible for constructing and operating the proposed groundwater facilities subject to the terms and conditions of BLM Serial Number N79742. The LCPD and the LCT activities would be authorized under separate ROW grants. Coordination is ongoing among the utilities regarding common construction, maintenance access roads and sharing of the ROW.

2.1.1.1 Production Wells

Groundwater from the Kane Springs Valley Hydrographic Basin would be supplied to the Coyote Spring Valley area from up to seven groundwater production wells. KPW-1, an existing well, was installed in 2005; therefore, up to six additional wells could be required. The well construction sequence, layout and number of new wells to be installed may vary by phase, depending on well output and additional geologic and hydrologic investigations.



Road Easement
(60 Feet Wide)
Kane Springs Road
(20 Feet Wide)
Transmission Easement
(100 Feet Wide)
138 kV Transmission Line
(with buried Fiber Optic Line)
Not to Scale
Diagram A: Typical Layout Planview
Lincoln County
Conservation, Recreation, and
Development Act Corridor
(2640 Feet Wide)
Road Easement
(60 Feet Wide)
Kane Springs Road
(20 Feet Wide)
Pipeline Easement
(30 Feet Wide)
12-24 Inch Water
Transmission Pipeline
and Fiber Optic Cable
Transmission Easement
(100 Feet Wide)
138/22.8 kV Electrical
Transmission Line
Not to Scale
Diagram B: Typical Layout Planview
Legend
Proposed Action
Alternative 1
US Route
State/Local Route
Drainage
Private Land
Existing Well
Water Pipeline
Dirt Road
Lincoln County Conservation, Recreation, and Development Act Corridor
Future Wellsite
Electrical Substation
Water Storage Tank
Electrical Transmission Line
Reno
Ely
Map Extent
Las Vegas
Delamar
Mountains
Approximate Location
Well KPW-7
Approximate Location
Well KPW-6
Approximate Location
Well KPW-5
Approximate Location
Well KPW-4
Approximate Location
Well KPW-3
Approximate Location
Well KPW-2
LINCOLN COUNTY CONSERVATION, RECREATION, AND DEVELOPMENT ACT CORRIDOR
138\22.8 kV Transmission Line
and Fiber Optic Corridor
(See Diagram B)
Kane Springs Wash
Existing Wells
KMW-1, KPW-1
(See Figure 2-5)
2640 FEET
93
Alternative 1
Approximate Location
Forebay Tank
Meadow
Valley
Mountains
Approximate Location
Terminal Storage Tank
Approximate Location
Emrys Jones Substation
138 kV Transmission Line
and Fiber Optic Corridor
(See Diagram A)
0
0.6
1.2
1.8
Miles
Kane Springs Valley Groundwater
Development Project
Map 2-1
Proposed Action and Alternative 1
Date: 12.07.07
File: KaneSprings_Fig2.1
Author: JAG

Initial pump tests for the KPW-1 production/test well indicate a flow rate of between 1,500 and 2,000 gallons per minute (gpm). If subsequent wells are equally productive, only one to two more wells may be constructed. At a minimum, 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.

Each wellhead would be enclosed in a masonry block structure meeting current Uniform Building Code construction standards and Lincoln County design requirements. A typical production well house building is shown in **Figure 2-1**. Each structure would contain all aboveground piping, shutoff valve, check valve, flow meter, air release valve, electrical equipment and telemetry. The structure would be constructed on a foundation elevated slightly above the surrounding grade to help minimize the potential for facility flooding. The size of the permanent well yard would be approximately 150 feet by 150 feet. All wellhead facilities would be enclosed inside an 8-foot high chain link fence that surrounds the well yard. Electric power would initially be provided to the production wells by the LCPD via a 22.8 kV circuit, which would tie into the proposed overhead 138 kV/22.8 kV transmission line. A typical production well facility site plan is shown in **Figure 2-2**.

Each production well 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 (bgs) (URS 2006a).

To disinfect source water, a concentrated sodium hypochlorite solution (12.5 percent chlorine) would be fed directly into the water pipeline at each wellhead. The solution would be stored in a 2,500-gallon, aboveground, high-density polyethylene tank located within each wellhead building. Secondary containment and related facilities would be provided in accordance with applicable Lincoln County Building Department and Uniform Fire Code regulations.

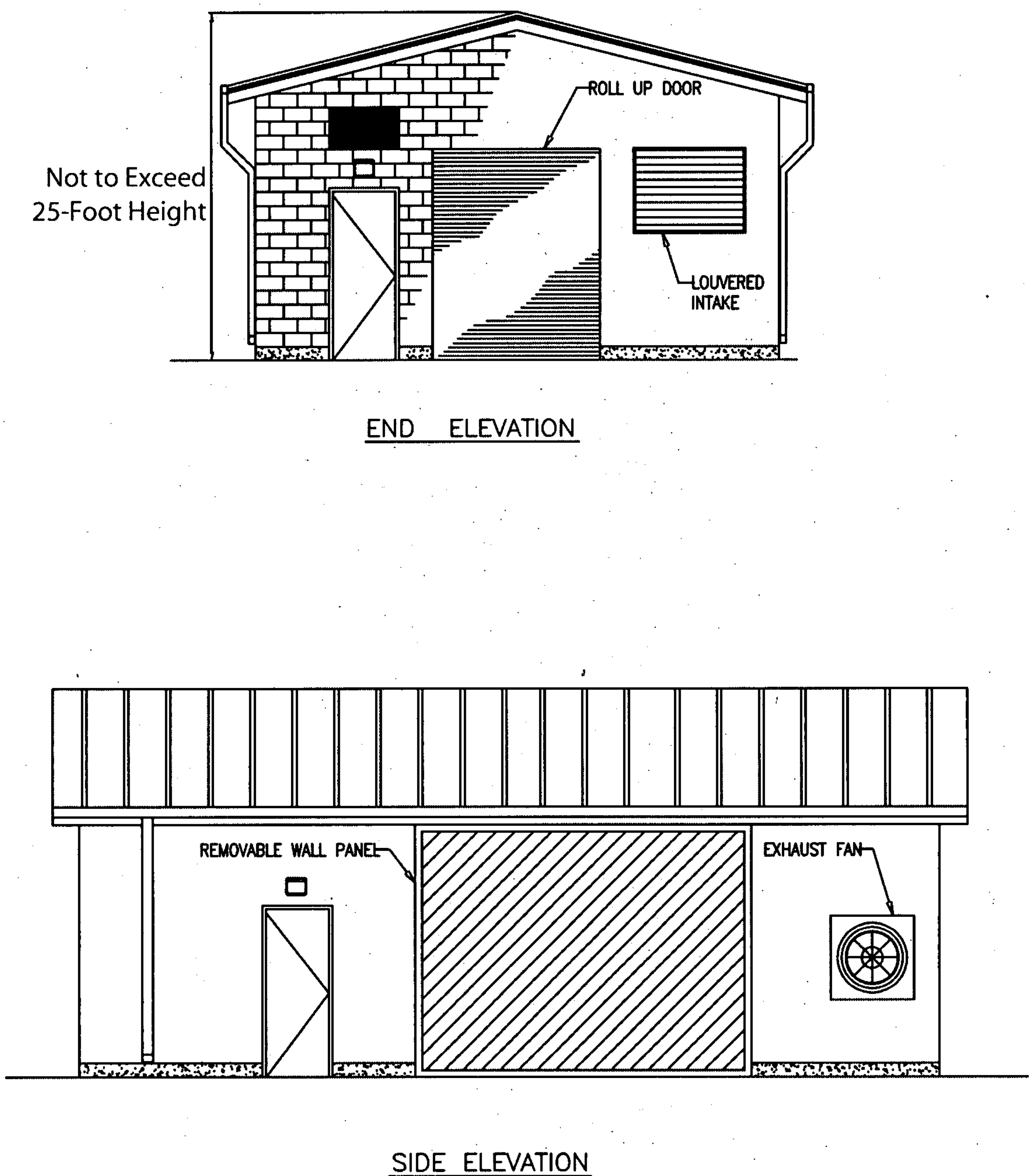
2.1.1.2 Monitoring Wells

An existing monitoring well (KMW-1) is located adjacent to KPW-1. The monitoring well was installed in 2005 to assist with the hydrogeology assessment of the Kane Springs Valley Hydrographic Basin. In addition to this monitoring well, a network of eight additional wells, located in Coyote Spring Valley to the south and east of the project area, is being used by the LCWD and others to monitor groundwater conditions in the area as identified in the LCWD, Vidler Water Company (Vidler), and USFWS Stipulation in **Appendix A.** Two new monitoring wells may also be installed per the Stipulation Agreement.

2.1.1.3 Pipelines

There are two types of groundwater pipelines associated with the Proposed Action:

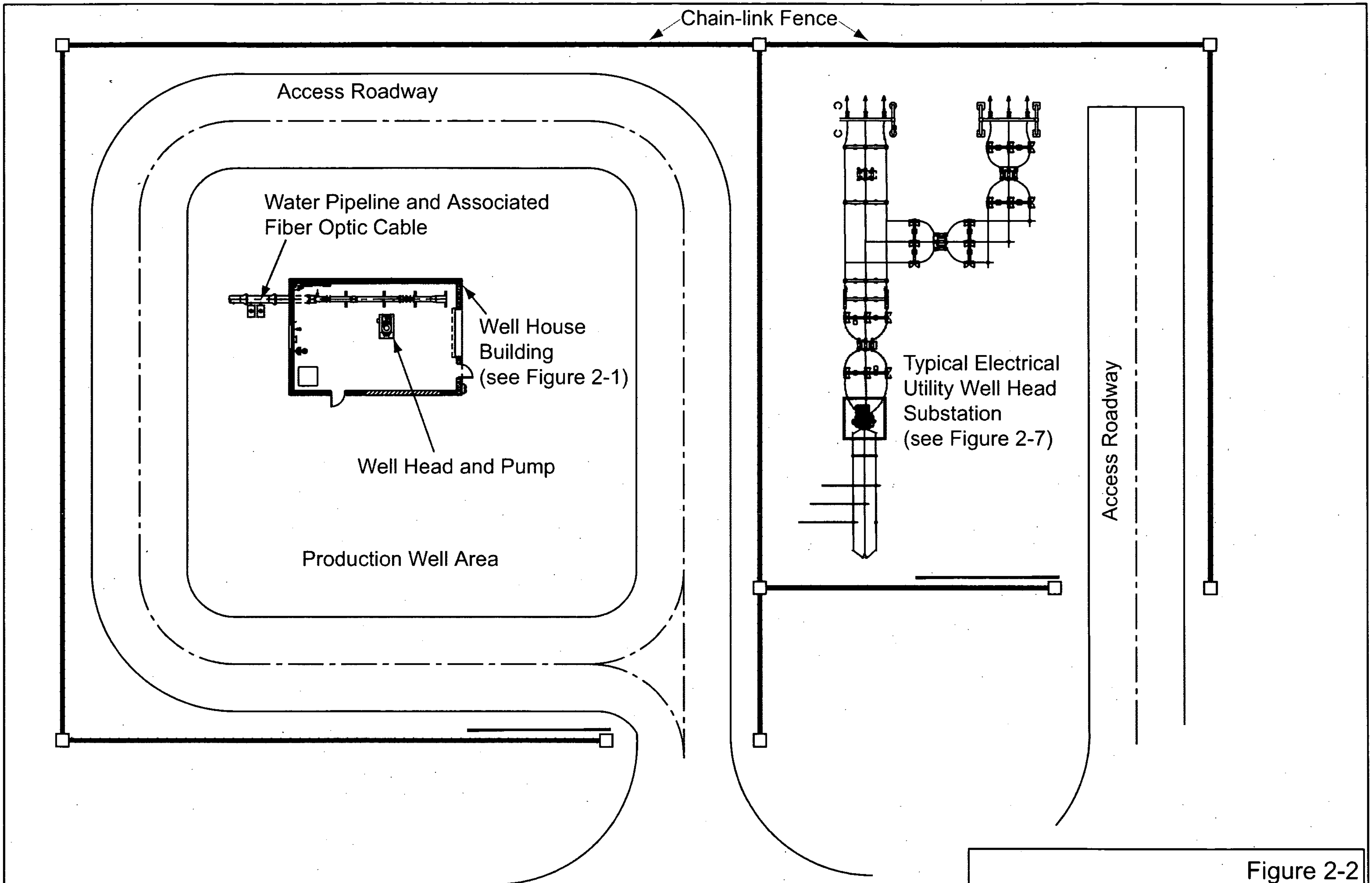
1) Well field pipeline collection system and
2) Main transmission pipeline.



Not To Scale
Source: LCWD, 2007

Figure 2-1
Typical Production
Well House Building

Kane Springs Valley
Groundwater Development Project



Not To Scale
Source: LCWD, 2007

Figure 2-2
Typical Production
Well Facility Site Plan

Kane Springs Valley
Groundwater Development Project

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.

2.1.1.3.1 Well Field Pipeline Collection System

The well field pipeline collection system would 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.

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 Road with a 60-foot wide construction easement and a 30-foot wide permanent easement. A typical parallel roadway alignment is shown on **Figure 2-3**. If cross-country construction is required, the temporary construction easement would be 75 feet wide with a permanent easement of 60 feet. A typical cross-country construction ROW easement is shown on **Figure 2-4**.

2.1.1.3.2 Transmission (Collection) Pipeline

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

Ancillary groundwater facilities (e.g., isolation valves and control valves) would be built on average every mile along the alignment. These facilities would be located mostly below existing grades in traffic-rated, lockable, concrete vaults that would vary in size. 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.

2.1.1.4 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 proposed KPW-1 site plan is shown on **Figure 2-5**.

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

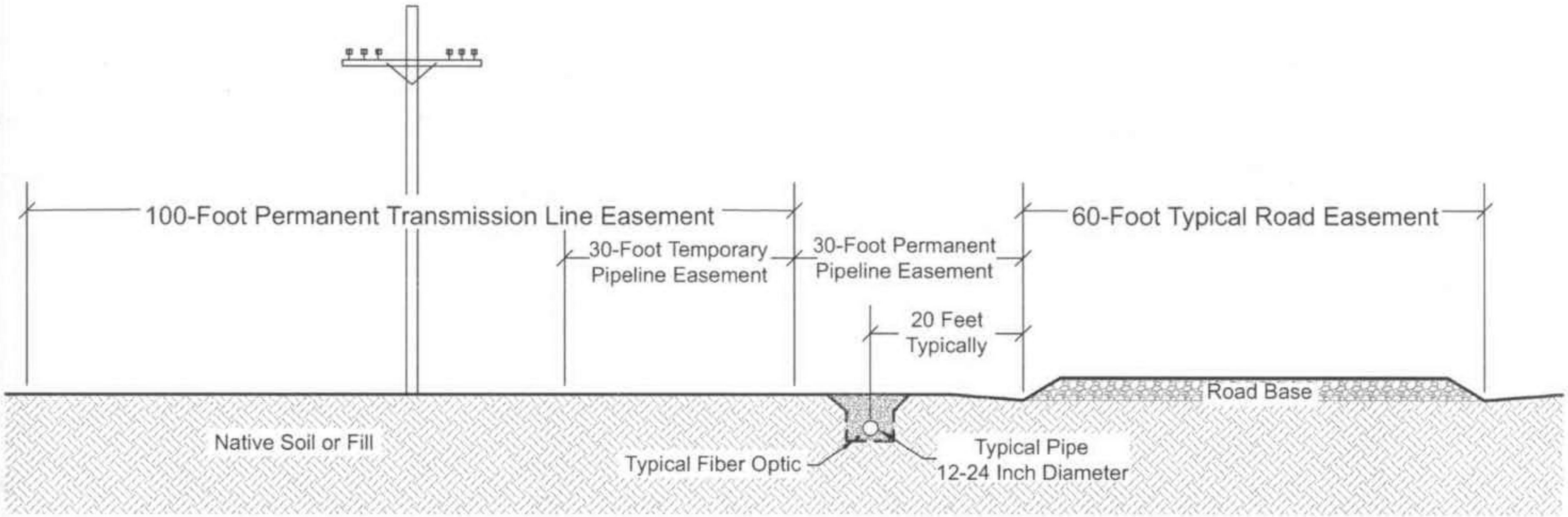


Figure 2-3
Typical Parallel Road Alignment
Right-of-Way Easement

Kane Springs Valley
Groundwater Development Project

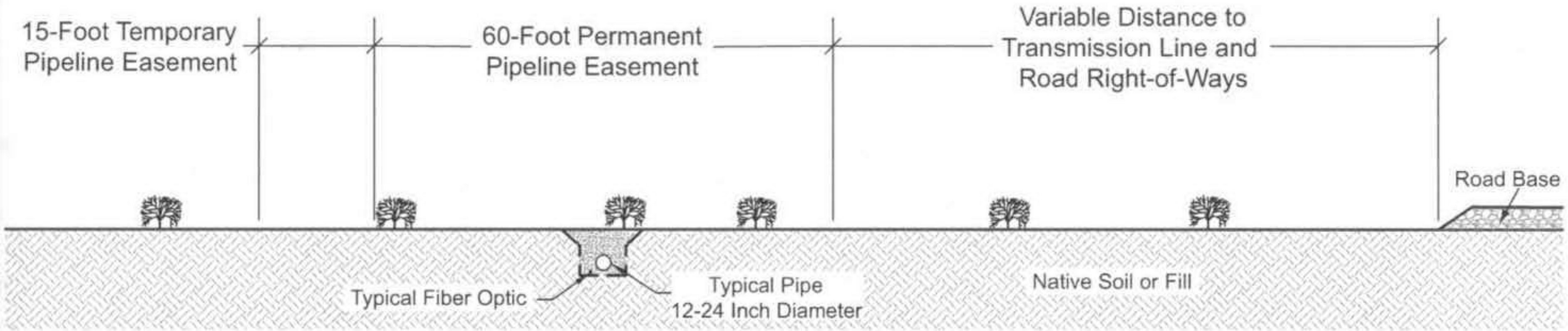


Figure 2-4
Typical Cross-Country
Construction Right-of-Way

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

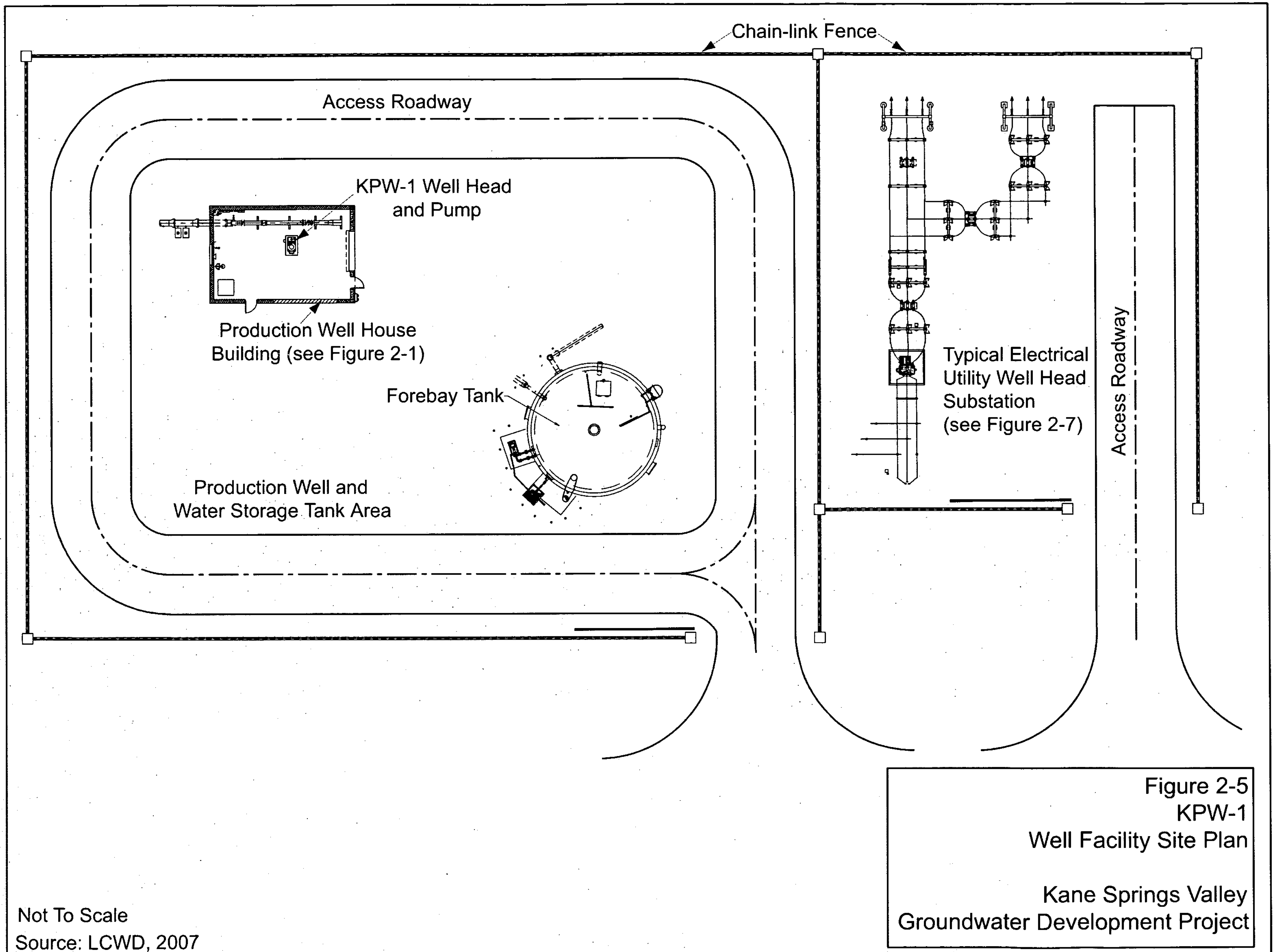


Figure 2-5
KPW-1
Well Facility Site Plan

Kane Springs Valley
Groundwater Development Project

A terminal water storage tank with a capacity of up to 700,000 gallons would eventually be constructed 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. A typical terminal storage tank configuration is shown on **Figure 2-6**. Construction of the terminal water storage tank is not anticipated to occur during Phase I.

2.1.1.5 Power Distribution

In order to provide reliable electric service to the well fields, the LCPD proposes to construct the power facilities necessary to support the development of the Kane Springs wells. The following section describes the electrical utility components.

2.1.1.5.1 138-kV Transmission Line

The LCPD proposes to construct and operate approximately 3 miles of 138 kV transmission line on tubular steel poles from Highway 93 east, along Kane Springs Road to the proposed Emrys Jones Substation. This portion of the 138 kV transmission line would tie into the LCPD's existing transmission line, located west of Highway 93. This portion of the line would be located on private property currently held by Coyote Springs Investments. The poles would be approximately 80 to 100 feet tall with span lengths varying from 400 to 700 feet, depending on terrain. Base diameters of the structures would vary from 3 to 7 feet. The proposed short-term disturbance for each structure is anticipated to be 0.25 acre (100 feet by 100 feet) with a long-term resulting disturbance of 0.06 acre (30 feet by 90 feet). After construction, each structure would occupy 0.06 acre (30 feet by 90 feet).

From the Emrys Jones substation, the LCPD proposes to construct a 138 kV transmission line on wood poles along Kane Springs Road to each of the proposed well sites. This line would initially be energized at 25 kV class distribution providing service to each of the proposed well sites through individual step-down substations at each well site to serve the pump motor and ancillary equipment. The poles would be approximately 65 to 80 feet tall with span lengths varying from 300 to 400 feet.

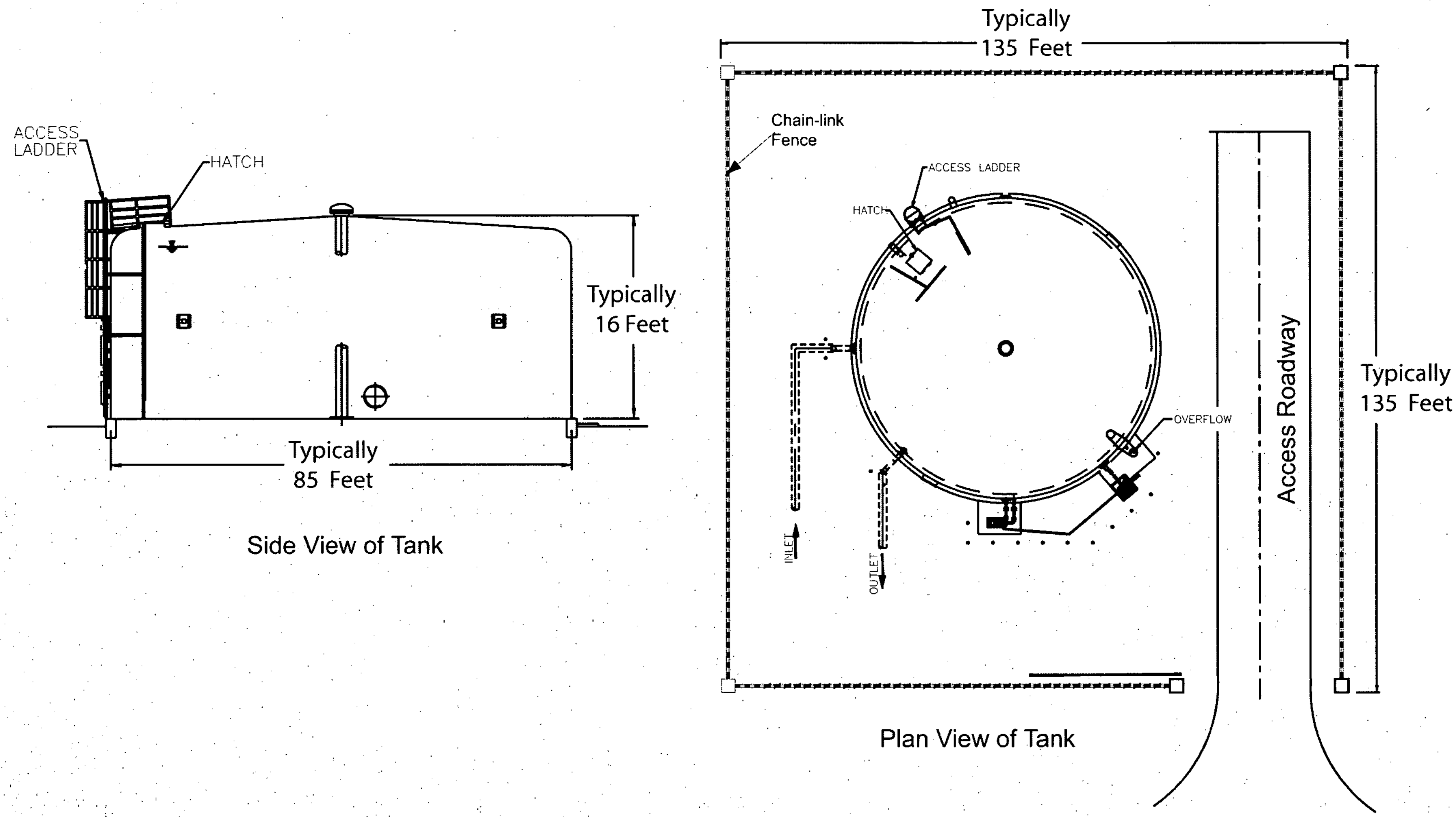
The alignment centerline for the transmission lines would typically parallel the water transmission pipeline within the permitted ROW. Additional temporary work areas may be required in areas of rough or steep terrain, wash crossings, and to avoid any areas identified as containing sensitive environmental resources.

Spur roads 16 feet wide may be needed to access some locations. Access roads would be constructed within the permitted ROW and constructed in accordance with the BLM and county specifications. The LCPD would coordinate with the LCWD and the LCT to provide common access for construction and maintenance.

2.1.1.5.2 Emrys Jones Substation

A proposed substation, occupying a fenced area of 450 feet by 400 feet (approximately 4.13 acres), would be constructed on private lands approximately 2.7 miles east of Highway 93 and south of Kane Springs Road. This proposed facility would transform voltage from 138 kV initially to 25 kV class distribution voltage. The substation would be planned and sized to accomodate future electrical needs in the northern Coyote Spring Valley area.

Not To Scale



Source: LCWD, 2007

Figure 2-6
Conceptual Terminal Storage Tank Layout

Kane Springs Valley Groundwater Development Project

The fenced substation yard would contain circuit breakers, air break switches, power transformers with oil containment facilities, bussing, steel structures, foundations and a grounding system. Protective relaying devices would be located within a control building.

2.1.1.5.3 Well Substation

To serve the well field, up to seven new substations, each with a footprint of approximately 115 feet by 95 feet would be constructed adjacent to each well. These substations would be served by the planned 138 kV/22.8 kV circuit on the transmission line. The fenced substation yards would consist of a 138 kV/22.8 kV to 4.16 kV pad-mounted step-down transformer, primary metering, switch cabinet, capacitor bank and a station service transformer. A typical well substation layout is shown in **Figure 2-7**.

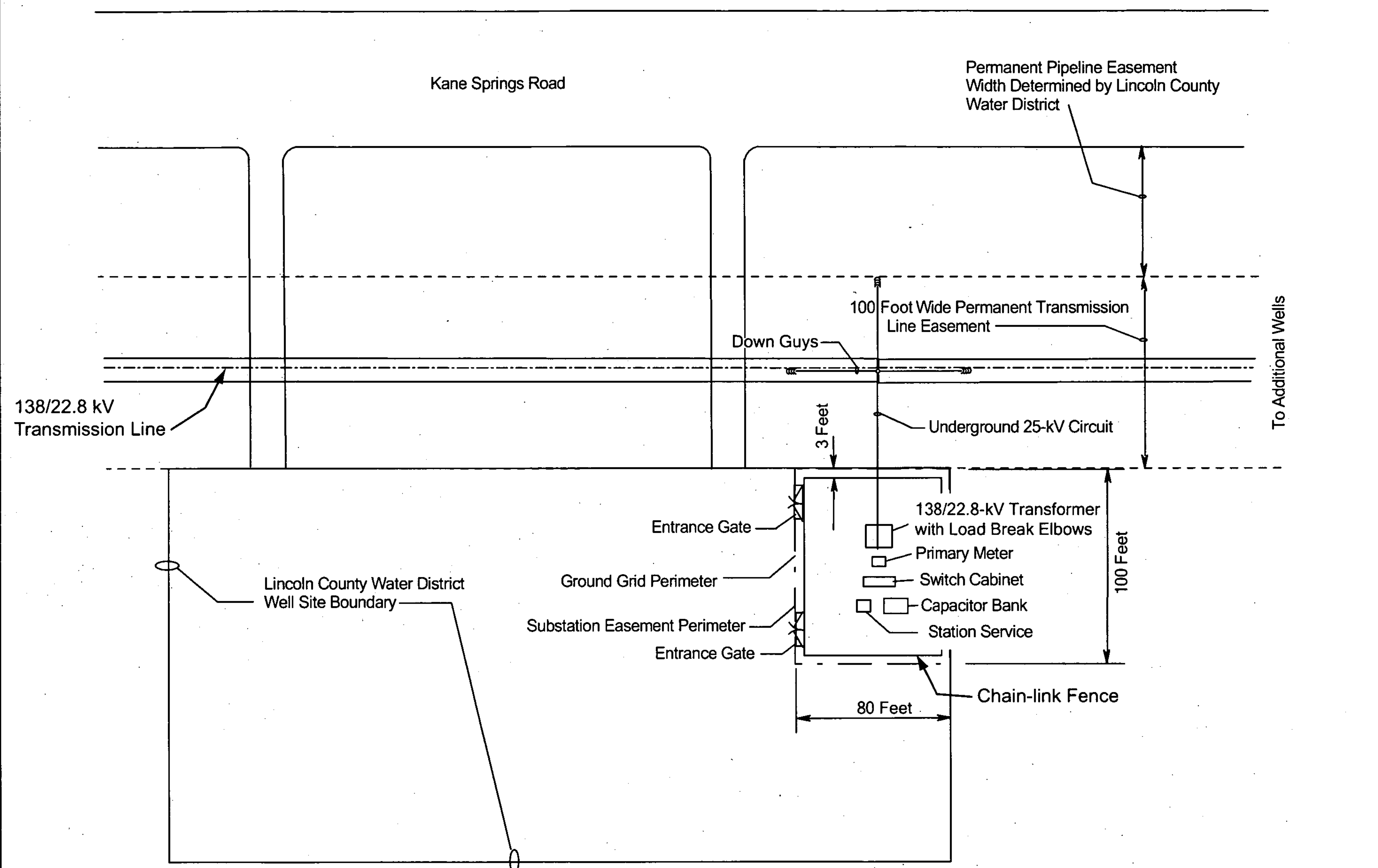
2.1.1.6 Fiber Optic

The LCT 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 cable would be used for communication to manage the pipeline operation and would tie into an existing fiber optic line located on the east side of Highway 93. The LCT would be required to apply for and obtain a separate ROW under the terms and conditions of the FLPMA.

2.1.1.7 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 **Appendix C** and in accordance with minimization and mitigation measures for impacts on private lands that may be required under Section 7 or Section 10, as appropriate.

Fire Hydrant – In 2005, a wildland fire burned approximately 8 acres within and near the northeastern third of the project area. The severity of wildland fires in 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. The LCWD would provide a fire hydrant within the locked enclosure at KPW-1/forebay site and a key(s) would be provided to the BLM's designated representative for access and use for fire suppression. During construction, all federal, state and county laws, ordinances, rules and regulations which pertain to prevention, pre-suppression and suppression of fires would be strictly adhered to. All construction personnel would be advised of their responsibilities under the applicable fire laws and regulations.



Not To Scale

Legend

Road

Easement Boundary

138/22.8-kV
Transmission Line

NOTES

1. Substation fencing to be chain link.
2. Primary substation spacing and insulation for 22.8-kV.

Source: LCWD, 2007

Figure 2-7
Typical Well Substation

Kane Springs Valley
Groundwater Development Project

2.1.1.8 Road Access and Transportation

Highway 93 and Kane Springs Road would provide primary access into the project area. Spur roads would be constructed from Kane Springs Road to temporary and permanent facilities sites, such as contractors' 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). New roads would be constructed only where existing access roads do not exist; otherwise, existing access roads would be improved. At this time, the exact location of access roads cannot be determined until final design is complete. The locations of these roads would be coordinated among the various utility agencies sharing the ROW in consultation with the BLM.

Where construction of access roads is needed, they would typically be 16 feet wide and constructed in accordance with the 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 Stormwater 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 provided in **Appendix C.**

Access roads not required after construction would be removed and restored to their approximate original contour 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 16 feet wide, graded to prevent slumping or washing and graveled to provide year-round access.

2.1.2 Construction Phasing

Construction of the Proposed Action would occur in three phases, with 1 to 3 years between construction phases. Phases and sequence of construction 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 AFY to the LCWD for groundwater withdrawal from the carbonate aquifer within the Kane Springs Valley Hydrographic Basin (Ruling 5712, see **Appendix B**). 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.

2.1.2.1 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

- 138 kV transmission line (up to 3 miles on private lands; 10.7 miles on BLM-administered public lands).
- Electrical Substations: Emrys Jones Substation (located on private land). Four step-down substations, one associated with each well, would be constructed on the BLM-administered public lands.
- 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 Stipulation Agreement between the USFWS and the LCWD.
- Extra Work Space: up to 50 acres total; each work space would occupy approximately 2 acres and would be spaced approximately 0.5 mile apart.
- Fire hydrant: to be sited adjacent to the forebay tank.

2.1.2.2 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

- As part of Phase II, the LCPD proposes to construct two additional step-down substations at the additional well facilities. In addition, the associated interconnection to the transmission line constructed in Phase I would be built at each well site.

2.1.2.3 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

- As part of Phase II, the LCPD proposes to construct two additional step-down substations at the additional well facilities. In addition, the associated interconnection to the transmission line constructed in Phase I would be built at each well site.

The temporary pipeline construction easement would be between 100 to 150 feet wide based on pipeline size, land use and topographic constraints. In general, the pipeline would parallel Kane Springs 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 to avoid 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 exact location of each project component (e.g., well yard, access road, electric pole structure) cannot be determined until final design is complete. Therefore, assumptions were made to determine impacts of the Proposed Action within a study corridor. For this analysis, the temporary construction corridor is considered to be 150 feet wide by 14 miles long (from Highway 93 to the northernmost well). 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. Final ground disturbance would be recalculated for the BLM Plan of Development (POD) when final design is complete and the exact location of structures and roads are known.

Table 2-1 Estimated Surface Disturbance By Land Ownership (At Full Build Out Of The Proposed Action)		
	Temporary (acres)*	Permanent (acres)*
Public (BLM)	167.0	17.0
Private	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).
BLM – Bureau of Land Management

2.1.3 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 most of the 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 construction, maintenance and operational activities within the authorized limits of the ROW. Standard construction techniques and safety requirements for each industry would be implemented (e.g., water pipeline construction, electrical facilities construction, telephone/communication facilities construction).

In addition to standard construction methods, the LCWD, LCPD, and the LCT 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 monitor whose responsibilities would include ensuring project activities are compliant with all applicable laws and regulations. Each construction contractor 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. A representative list of laws and regulations that may apply to the Proposed Action is provided in **Table 1-1**. A representative list of required permits that may apply to the Proposed Action is provided in **Table 1-2**.

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. Common construction activities, including construction of temporary and permanent access roads, and environmental compliance monitoring would be coordinated among the various utility agencies sharing the permitted ROW. To supply electrical power to the well fields, it is anticipated the 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 would be performed.
- Reas would be cleared and graded for access road construction.
- Wire handling areas and laydown sites would be prepared.
- Material storage and handling would be established.
- Structure holes would be excavated.
- Structures would be assembled and erected.
- Conductor and shield wires would be strung.
- Post-construction cleanup and reclamation would be performed.

Construction of the substations would involve the following sequence:

- Engineering surveys and staking would be performed.
- Area would be cleared and graded for access road construction, and the structure site would also be graded.
- Material storage and handling would be established.
- Concrete foundations would be poured and the grid would be grounded.
- Below-grade raceway would be installed.
- Equipment, structural steel and bus installation would be installed.
- Above-grade raceway would be installed.
- Control buildingwould be constructed.
- Low-voltage wiring would be installed.
- Security fencing would be installed.
- The yard would be surfaced.
- Equipment would be tested.
- Post-construction cleanup and reclamation would be performed.

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

- Engineering surveys and staking would be performed.
- Topsoil salvage and storage would be undertaken.
- Areas would be cleared and graded for access road construction.
- Trenching and blasting would be conducted.

- The pipeline would be strung and installed.
- Fiber optic line would be installed in the common pipeline trench.
- The trench would be backfilled.
- The pipeline would undergo hydrostatic testing.
- Disturbed area would be regraded and post-construction cleanup and reclamation would be performed.

2.1.3.1 General Construction Procedures

The final project design would be coordinated among the utility agencies and the BLM before starting construction. Each utility agency would be required to submit a final 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 subsections describe the general sequence of construction activities for the groundwater, electric utilities and fiber optic lines.

2.1.3.1.1 Survey and Staking

The first step of construction would involve marking the limits of the approved work area (e.g., the construction ROW boundaries, additional temporary workspace area, the locations of approved roads and environmentally sensitive areas). These activities may precede the issuance of a Biological Opinion for the Proposed Action. If this were to occur, the BLM would require that surveying and flagging activities be conducted on foot, and any off-road vehicle travel must follow appropriate Section 7 consultation.

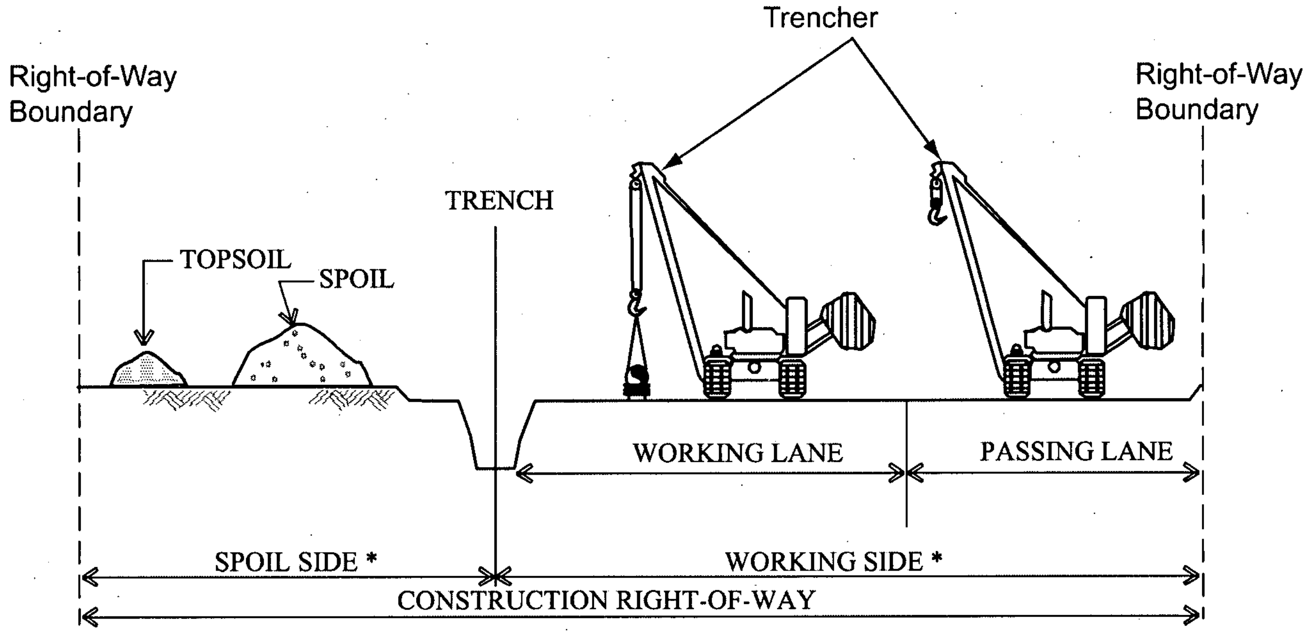
A survey crew would stake the centerline of the proposed trench before the pipeline is trenched and excavated. Survey activities for construction of the electric system would occur concurrent with pipeline construction. The LCPD's survey and staking activities would consist of identifying boundaries of the LCPD ROW, pole structure locations, substation locations, access road locations and temporary work area locations.

2.1.3.1.2 Topsoil Salvage and Storage

Topsoil would be handled 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. Topsoil salvage and storage would be accomplished in accordance with the commitments listed in **Appendix C.** Topsoil salvage procedures are depicted on **Figure 2-8.**

2.1.3.1.3 Clearing and Grading

Before clearing and grading areas for construction of project features, fences would be braced and cut, and temporary gates and fences would be installed to contain livestock, if present. The ground would be graded where necessary to provide a reasonably level work surface.



Not To Scale

* Widths as defined on Construction Drawings

NOTES:

1. Vegetation will be mowed, cut, scraped or otherwise removed to ground level on the spoil side of the ROW. Root structures will be left intact in the soil.
2. Salvage topsoil over trench and working side at locations and depths identified on the Construction Drawings or as directed by the Project Developer's Representative. Strip shall be wide enough to accommodate a working and passing lane.
3. Stockpile topsoil as shown or in any configuration approved by the Project Developer's Representative. Keep topsoil clean of debris. Maintain a minimum 1 foot separation between topsoil and spoil pile edges.
4. Leave gaps in topsoil piles at drainages. Do not push topsoil into creeks or wetlands. Do not use topsoil for padding.
5. Apply water, tackifier, or short-term stabilizers to soil stockpiles as necessary to prevent wind erosion and for dust control.
6. Avoid scalping vegetated ground surface when backfilling spoil pile.

Source: LCWD, 2007

Figure 2-8
Procedures for Trenching, Working, and Topsoil Salvage

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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. Best Management Practices (BMPs) for clearing and grading activities are listed in **Appendix C.**

2.1.3.1.4 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 of shallow or exposed bedrock. If blasting were required, strict safety precautions would be followed including compliance with federal, state and local codes and ordinances; manufacturer's prescribed safety procedures; and industry practices. Standard construction and operation procedures for trenching and blasting activities would be conducted in accordance with commitments listed in **Appendix C.**

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 ground 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 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.

2.1.3.1.5 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. An auger is affixed to the crane 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 (APLIC 1996).

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 (USDA).

2.1.3.1.6 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 (ft/day).

Before the pipeline is lowered in, the trench would be inspected to make sure it was free of trapped wildlife, as well as rocks and other debris that could damage the pipe or protective coating. Side-boom tractors and 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 installed to protect the pipe before it is lowered into the trench.

The fiber optic cable would be buried in a common trench with the water transmission pipeline. Between the terminal storage tank and Highway 93, the fiber optic line would be buried within the Kane Springs Road ROW. 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.

2.1.3.1.7 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.

2.1.3.1.8 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 the water for at least 4 hours. Any significant loss of pressure indicates a potential leak and may require further inspection.

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 NDEP Bureau of Water Pollution Control, and permit controls addressing erosion control would be implemented. The primary source of water for hydrostatic testing would be from the production well. Test water would be transferred among 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 measure 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.

2.1.3.1.9 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 satisfaction of post-construction commitments for the ROW and other component sites.

The contractor(s) would be required to employ a continuous cleanup program throughout construction. Restoration would include removal of deep ruts and 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.

2.1.3.2 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 plants 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.

2.1.3.3 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 pipeline would be operated and maintained 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 would be backfilled and compacted to support the pipe so that normal operations could resume as soon as possible.

Prior to site reclamation, the 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 the LCPD.

2.1.3.4 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 the BLM requirements in effect at the time.

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

2.1.4 Applicant Proposed Environmental Protection Measures

Applicant proposed measures to reduce or minimize construction-related impacts are outlined in **Appendix C**. In addition, the LCWD and the 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. A final POD would be required by the BLM prior to issuance of the Record of Decision. If the project is approved, the POD and any additional site-specific stipulations that are determined to be necessary on federal lands would be appended to the ROW issued by the BLM. The supplemental plans in the POD for the Proposed Action are described in **Table 2-2**. The Applicant must also comply with mitigation measures directed by the Stipulation Agreement between the USFWS and LCWD/Vidler (Appendix A), and any future monitoring plan required by the Nevada State Engineer as a component of the water rights appropriations.

Table 2-2
Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan[1]	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. • The LCWD would use the Environmental Management Plan to coordinate 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 off site, and reduce the velocity of storm water flowing off site. • 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 2-2 (continued)
Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan[1]	Description Summary/Highlights	Resource Element
Revegetation Plan	• Describes procedures the LCWD and its contractors would use to revegetate 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 the 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
Fire Mitigation Plan	• Identifies measures to be taken during construction, operation and maintenance of the project facilities to prevent and suppress fires. • Establishes 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
Dust Control Plan	• Describes dust control measures the LCWD and its construction and reclamation contractors would implement during project construction in accordance with local regulations. • Designed to comply with the NDEP – Bureau of Air Pollution Control Surface Area Disturbance Permit requirements.	Includes measures designed to reduce or minimize short-term construction-related impacts on air quality.
SPCCC Plan	• Describes spill prevention practices, emergency response procedures, emergency and personnel protection equipment, release notification procedures and cleanup procedures.	Includes measures designed to reduce impacts to water quality from inadvertent spills or leaks.
Noxious Weed Management Plan	• Includes site-specific measures the 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.

Table 2-2 (continued)
Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan[1]	Description Summary/Highlights	Resource Element
Access Road Plan	• Describes measures to be taken by the 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 and wildlife habitat; potential spread of noxious weeds; and potential for air quality issues, sedimentation and erosion.
Hydrostatic Test Dewatering Plan	• Identifies the sources and volumes of water that would be used to test the pipe prior to operation and the discharge locations.	Includes measures designed to reduce impacts to surface water drainages from hydrostatic test water discharges.
Blasting Plan	• Identifies blasting procedures including safety, use, storage, and transportation of explosives that are consistent with minimum safety requirements as defined by federal, state and local regulations.	Includes measures to reduce health and safety impacts to construction crew, vegetation communities and wildlife habitat. To minimize potential blasting impacts to wildlife, the Applicant would coordinate with the appropriate agency (BLM, USFWS) prior to blasting.

[1]Please refer to **Appendix C** for representative specific applicant proposed environmental protection measures applicable to the above summarized supplemental plans. BLM – Bureau of Land Management; 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; USFWS – U.S. Fish and Wildlife Service

2.2 ALTERNATIVE 1 – POWER LINE ALIGNMENT

Cross-country construction across undisturbed land would be required under Alternative 1. To construct the 138 kV overhead transmission line and install the buried fiber optic line, a permanent access road (up to 2.7 miles) would be constructed east of Highway 93 to the Emrys Jones Substation. The proposed location of this alternative is shown on **Map 2-1**. The process for constructing the 138 kV transmission line would be the same as that described under the Proposed Action. The fiber optic line would be buried within the permitted ROW adjacent to the overhead transmission line.

The electric transmission line and fiber optic line 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. After construction, the access road between Highway 93 and the Emrys Jones Substation would be maintained by the LCPD for routine maintenance activities. All disturbed lands would be located within the designated LCCRDA utility corridor.

Portions of the road would cross area drainages. This would involve the potential installation of drainage structures. To the maximum extent possible, drainages would be crossed at grade. Culverts would be installed in areas where these crossing are not feasible.

Preconstruction clearances would be required prior to any ground-disturbing activities. At a minimum, access would require completion of cultural resource surveys and biological surveys, along with appropriate SHPO and USFWS consultation and approvals.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative represents the status quo — not approving or implementing the Proposed Action or Alternative 1. Analysis of the No Action Alternative is required by NEPA guidelines. Under the No Action Alternative, the BLM would not approve the LCWD's ROW application as submitted, and the Proposed Action would not be constructed on federally managed lands. The Nevada State Engineer has permitted 1,000 AFY of groundwater from the Kane Springs Valley Hydrographic Basin. Selection of the No Action Alternative would not preclude the LCWD from pumping their permitted water rights in accordance with the Nevada State Engineer's Ruling, nor would it preclude another entity from constructing other projects within the same corridor, subject to approval by the BLM.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

An interdisciplinary (ID) Team of resource specialists from various BLM offices, representatives from cooperating agencies, the Applicant's consultants, and the EIS consultant team were assembled to assist in evaluating the environmental issues to be addressed in the EIS. The ID Team analyzed the Proposed Action, Alternatives to the Proposed Action, and the No Action Alternative. The following criteria were used to establish a threshold for developing potential alternatives that respond to the purpose of, and need for, the Proposed Action and meet the BLM policy and direction.

- The alternative should be consistent with management guidance contained in the approved Caliente MFP and other applicable BLM policy and direction.
- The alternative must meet the purpose of and need for action.
- The alternative must be feasible from technical and economic standpoints while remaining environmentally responsible.
- The alternative must be capable of implementation in a timely manner.
- The alternative must appear to offer an environmental advantage over the Proposed Action or other action alternatives analyzed.

In addition to the Proposed Action and No Action Alternative, one other alternative (Alternative 1) was identified for detailed study. Several other alternatives were considered during initial project planning. They included locating the proposed terminal storage tank on public lands, burying the electrical lines and installing aboveground pipelines instead of burying the pipelines. These alternatives were eliminated from detailed analysis because they provided no environmental advantage or benefit over the Proposed Action. More detail is provided in the following subsections.

2.4.1 Terminal Storage Tank on Public Lands

This alternative would entail constructing the terminal storage tank on public lands instead of private lands, as proposed under the Proposed Action. This alternative was eliminated from further analysis in the EIS because it provides no environmental advantage or benefit over the Proposed Action. Private lands are available for the construction of the tank.

2.4.2 Underground Electrical Transmission and Distribution Lines

Selection of this alternative would require the transmission line and distribution lines to be buried parallel to the water transmission and collection pipelines and fiber optic line from the production wells to the terminal storage tank. The transmission line would also be buried from the terminal storage tank to Highway 93. This alternative was eliminated from further analysis in the EIS because, while it is technically feasible to bury transmission lines, it is not cost-effective for construction and maintenance. The cost of burying transmission lines is estimated to be 7.5 to 12 times higher than traditional overhead construction for a given project (Johnson 2003). Also, it is standard operating procedure for transmission lines within road ROWs to be constructed aboveground to minimize infrastructure constraints within public easements (e.g., installation of public works such as water pipeline and sewer).

2.4.3 Aboveground Water Transmission Pipeline

This alternative would involve constructing the water transmission pipeline aboveground (over a distance of approximately 3.8 miles). This alternative was eliminated from further analysis in the EIS because it provides no environmental advantage over the Proposed Action or other action alternative analyzed. Constructing the water transmission pipeline aboveground would result in greater visual impacts and may act as a barrier to wildlife. The potential for vandalism and road safety issues would also be greater. Also, it is standard operating procedure for water transmission pipelines to be buried within road ROWs to minimize infrastructure constraints within a public easement.

2.5 AGENCY PREFERRED ALTERNATIVE

The Agency Preferred Alternative is the Proposed Action.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Geological Resources – Sections 3.1 and 4.1		
The Proposed Action would not result in impacts to geologic resources. However, seismic activity in the region could potentially impact the structures and facilities constructed under the Proposed Action. All project components would be constructed in accordance with applicable regulations, engineering protocols and safety standards to minimize any potential impacts to structures from seismic activity.	Impacts to geological resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to geological resources would occur on public lands.
Soil Resources – Sections 3.2 and 4.2		
Approximately 195 acres of surface disturbance from construction of project facilities, of which 167 acres are BLM-administered public lands. Approximately 25 acres would remain permanently impacted by project components (well yards, access roads, and overhead poles); of these approximately 17 acres would be on BLM-administered public lands and approximately 8 acres on private land. Construction of Phases 2 and 3 would result in less than 2.2 acres of additional temporary disturbance, with less than 1.1 acres remaining under additional facilities. Potential impacts to soil resources include increased soil compaction and erosion from wind and water, and chemical changes resulting from mixing surface soils with subsoil during salvage activities. These impacts are expected to be minimized, to the extent possible, following reclamation.	The 138 kV transmission line and buried fiber optic line would be constructed within a 100-foot wide construction easement between Highway 93 and the Emrys Jones Substation - a distance of approximately 2.7 miles. The disturbance corridor would be located entirely within the designated LCCRDA utility corridor. Approximately 32 acres of previously undisturbed desert land would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	No project-related impacts to soil resources would occur on public lands.
Water Resources – Sections 3.3 and 4.3		
Potential impacts to surface water may include increased erosion and sedimentation from surface disturbance related to construction activities and hydrostatic testing water discharges and impacts to water quality from accidental spills. Potential direct impacts to groundwater include impacts to groundwater quantity as a result of drawdown (lowering of the water table) within the well head and potential indirect impacts may be related to lowered yields at regional springs.	Impacts to water resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to water resources would occur on public lands.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Groundwater pumping associated with the Proposed Action will be subject to terms and conditions imposed by the Nevada State Engineer, and the Monitoring, Management, and Mitigation Plan included in the Stipulation Agreement between the USFWS and LCWD. The Stipulation Agreement outlines "trigger points" that serve to minimize adverse impacts including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached.		
Vegetation Resources – Sections 3.4 and 4.4		
Potential direct impacts to vegetation resources associated with construction activities could include crushing and/or removal of native vegetation and introduction of invasive and noxious weeds. Temporary disturbance would be 195 acres, and permanent disturbance would be 25 acres. There would be no direct or indirect impacts to vegetation resources associated with operation and maintenance of the Proposed Action. No potential habitats for federally listed Threatened, Endangered, and Sensitive Plant Species occur within the Proposed Action ROW. Cacti species protected by Nevada law would be salvaged and restored as a part of the Proposed Action's Reclamation Plan.	Approximately 32 acres of additional previously undisturbed Mojave Creosote Bush Scrub and Mojave Desert Wash Scrub vegetation communities would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	No project-related impacts to vegetation resources would occur on public lands.
Wildlife Resources – Sections 3.5 and 4.5		
Direct effects on wildlife resources can result from ground disturbance caused by construction-related activities, which can impact wildlife habitat by removing vegetation, altering plant composition or structure, and/or by altering soil characteristics. Potential indirect effects during construction activities include degradation of soil due to fuel contamination, harassment from human presence, and increased levels of noise and vibration due to construction, equipment movement, or blasting.	Approximately 32 acres of additional previously undisturbed wildlife habitat would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	No project-related impacts to wildlife resources would occur on public lands.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Long-term direct impacts can occur from loss of vegetation and wildlife habitat resulting from continued disturbance from operation and maintenance. Additionally, wildlife species could be temporarily displaced from areas of human activity during operation and maintenance activities. Indirect long term impacts can result from increased public access and project maintenance. The Proposed Action would also have long-term beneficial effects to wildlife in the project area with the development of a local water supply. The desert tortoise is the only federally listed species that may occur within the Proposed Action ROW. Approximately 23 acres of desert tortoise habitat would be permanently disturbed and 195 would be temporarily disturbed by construction of the Proposed Action. A remuneration fee would be paid for each acre disturbed to Lincoln County's Land Disturbance Fee Fund for compensation of desert tortoise habitat loss. There is no habitat for Moapa dace within the project area; however, there is habitat for this species in the Muddy River system approximately 28 miles south of the project area. Groundwater pumping associated with the Proposed Action could have the potential to impact flow rates in the Muddy River system, potentially decreasing pool and riffle habitat. 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) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. Potential impacts to Nevada BLM Sensitive and/or State protected species including gila monster, chuckwalla, and Western Burrowing Owl would be mitigated by specific protection measures described in the Standard Construction and Operation Procedures in Appendix C for the EIS.	Disturbance to desert tortoise habitat under Alternative 1 would be slightly greater than that under the Proposed Action. Approximately 28.2 acres (5.2 acres more than the Proposed Action) of desert tortoise habitat would be permanently disturbed by construction of Alternative 1. Approximately 195 acres would be temporarily disturbed. Of these totals, 19.6 acres (federal and private lands) of permanent disturbance would occur in the Mormon Mesa Critical Habitat Unit. Approximately 157.6 acres of temporary disturbance would occur in the Mormon Mesa Critical Habitat Unit. Permanent and temporary disturbance make 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 Road ROW. Approximately 147.2 acres of critical habitat on federal land would be disturbed. As described for the Proposed Action, the environmental protection measures that would be implemented as part of this alternative would reduce potential direct impacts to fish and wildlife species. Impacts to Moapa dace would be the same as the Proposed Action.	

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Direct impacts to birds in the vicinity of the project area include direct mortality from increased human traffic during operation and maintenance activities, direct disturbance of nests, and nest abandonment as a result of increase human presence and/or operation noise.		
Land Use – Sections 3.6 and 4.6		
Approximately 195 acres of surface disturbance from construction of project facilities, of which 167 acres are BLM-administered public lands. Following construction 25 acres (17 acres public, 8 acres private) would be maintained as permanent ROW and aboveground facilities. While land ownership would remain unchanged, grazing and public use of the area may experience short-term disruption during construction. Following reclamation, temporary disturbance areas would be returned to pre-construction conditions. The Proposed Action would not affect access to, nor availability or development of, oil and gas or any locatable/saleable mineral resources in the project area, nor would it reduce forage levels that would lead to grazing impacts in either the Delamar or Grapevine allotments. Implementation of Proposed Action would have short-term impacts on traffic flows and volumes and also may contribute to roadway deterioration of Kane Springs Road during construction. The LCWD has prepared an Access Road Plan which describes environmental protection measures and standard operating procedures for transportation-related activities.	Alternative 1 would be located entirely within the designated LCCRDA utility corridor. Up to 32 acres of previously undisturbed desert would be temporarily disturbed by construction of the 138 kV transmission line and buried fiber optic line. After construction, project components would impact approximately 5 acres (16-foot wide maintenance road and pole footprint).	Land use would not change on federal lands. However, land use changes would continue on adjacent private lands including construction of the Emrys Jones Substation and associated transmission lines.
Areas of Critical Environmental Concern, Wilderness, and Other Special Use Areas – Sections 3.7 and 4.7		
Indirect impacts may affect the Delamar Mountains and Meadow Valley Range Wilderness as a result of increased noise, dust, odors and increased traffic from construction activities. However, these impacts would be temporary and localized. After construction, all areas not permanently impacted by a project facility would be reclaimed and revegetated to pre-construction conditions.	Up to 32 acres of previously undisturbed lands within the Kane Springs ACEC would be temporarily disturbed during construction. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road (up to 16 feet wide) and pole footprints.	There would be no project-related impacts to ACECs, Wildernesses, or other special use area under the No Action Alternative.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Recreation – Sections 3.8 and 4.8		
Construction activities along portions of Kane Springs Road may temporarily restrict access into surrounding Delamar Mountain and Meadow Valley Range Wildernesses. The Proposed Action would not preclude the use of these areas, but rather would require recreational users to temporarily relocate to surrounding recreation areas if access roads are restricted due to construction. Operation and maintenance of the project facilities would not limit public access to recreation opportunities in the surrounding area.	Impacts to recreation under Alternative 1 would be the same as those described under the Proposed Action.	No project-related impacts to recreational use of public lands would occur under the No Action Alternative.
Air Quality – Sections 3.9 and 4.9		
Construction activities would result in temporary emissions of fugitive dust (particulate matter). These emissions would dissipate following completion of construction and would not be expected to travel great distances from the generation site. Temporary gaseous emissions would be generated during construction from diesel-powered well-drilling and other construction equipment. Emissions would be limited by state and federal regulations, and would be minimized through proper operation and maintenance.	Impacts to air quality under Alternative 1 would be same as those described under the Proposed Action.	Under the No Action Alternative, there would be no short-term construction-related exhaust or fugitive dust impacts. No impacts to air quality would occur under the No Action Alternative.
Noise – Sections 3.10 and 4.10		
Major sources of noise associated with the Proposed Action would be from construction-related equipment and are predicted to be below levels of concern. Equipment used during construction activities would include standard construction and earth moving equipment and well development equipment such as drill rigs. Construction noise levels would be short-term, brief and intermittent. Long-term noise levels associated with wellhead, pump station and pipeline operations would generally be steady and continuous, and are predicted to be at lower levels than construction noise.	Impacts to noise under Alternative 1 would be same as those described under the Proposed Action.	Under the No Action Alternative, the Proposed Action would not be built on public lands. Therefore, there would be no short-term construction noise impacts nor any long-term operation impacts associated with the Proposed Action.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Visual Resources – Sections 3.11 and 4.11		
Short-term visual impacts would occur during construction as views of construction equipment, increased traffic and construction activities are introduced into the local viewshed. Clearing and excavation activities associated with the installation of project components would remove vegetation communities within the pipeline alignment. Immediately following installation, these areas would be reclaimed and revegetated to pre-construction levels. The visual impact of vegetation removal would be minimal because of low color contrast associated with the characteristic vegetation and the underlying soils. The proposed overhead transmission line would be within the foreground distance zone of sensitive viewing areas, which is limited to Highway 93. No other proposed facilities would be visible from sensitive viewing areas, as they are isolated from views by distance or intervening terrain. The Proposed Action would meet the BLM VRM Class IV objectives because they provide for a high level of change to the characteristic landscape.	Impacts to visual resources under Alternative 1 would be similar to those described for the Proposed Action. However, under Alternative 1, the overhead power line would stay entirely within the LCCRDA corridor between Highway 93 and the Emrys Jones Substation. The only sensitive viewing area for this alternative would be along Highway 93. The proposed power lines would be partially screened from view by existing topography along the highway.	The No Action Alternative would result in no project-related impacts to visual resources because no new facilities would be constructed or operated on public lands.
Socioeconomic Resources – Sections 3.12 and 4.12		
Implementation of the Proposed Action would have a minimal affect on the social and economic resources from the associated increase in the level of economic activity. Increased economic activity would result from increased payroll earnings during project construction, which would be spent on items such as housing, food, goods and services. The Proposed Action would not have any direct growth-inducing effects because it is estimated to take from 90 to 180 days to complete and requires a construction work force of no more than 160 workers. Indirect effects may result from continuing planned developments in Clark and Lincoln Counties.	Impacts to socioeconomic resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to socioeconomic resources would occur.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Environmental Justice – Sections 3.13 and 4.13		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations, because these populations are not present in the vicinity of the project area. Therefore, implementation of the Proposed Action would have no impact on environmental justice issues.	Impacts to environmental justice under Alternative 1 would be same as those described under the Proposed Action.	The No Action Alternative would result in no project-related impacts to environmental justice.
Hazardous Materials and Solid Waste – Sections 3.14 and 4.14		
Potential for accidental release of hazardous and toxic materials would be minimized through the implementation of Environmental Management Plan and SPCCC Plan prepared by the LCWD as part of their POD. The amount of solid wastes generated from construction and operation would not affect the life expectancy of the municipal solid waste facilities currently operating in regional area. Any hazardous materials would be disposed at an EPA-approved hazardous waste facility. Therefore, there would be no impact from the Proposed Action on existing waste facilities in the region.	Impacts from hazardous materials and solid waste under Alternative 1 would be same as those described under the Proposed Action.	There would be no project-related hazardous materials or solid waste produced under the No Action Alternative.
Paleontological Resources – Sections 3.15 and 4.15		
No known fossil paleontological resources have been identified in the vicinity of the project area; therefore, no impacts resulting from construction, operation and maintenance of the Proposed Action are anticipated. However, construction activities may result in unanticipated exposure of Holocene and late Pleistocene vertebrates or pack rat middens. If these items are discovered during construction, the BLM would be contacted, according to the SOPs in Appendix C, to determine steps necessary to evaluate the need to preserve the paleontological resources.	Impacts to paleontological resources under Alternative 1 would be the same as those described under the Proposed Action.	Under the No Action Alternative, no project-related impacts would occur to paleontological resources.

Table 2-3
Summary of Impacts by Resource for the Kane Springs Valley Groundwater Development Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Archeological Resources and Historic Properties – Sections 3.16 and 4.16		
The Proposed Action would result in the damage or displacement of 59 isolated occurrences (primarily chipped stone artifacts) as a direct consequence of project construction. Three non-eligible NRHP properties (old Highway 93 and two diffuse prehistoric lithic scatters) could be impacted by construction. Impacts along a segment of old Highway 93 would occur only where the highway crosses the APE. There would not be any indirect effects from construction or any direct or indirect affects from operation and maintenance impacting any historic landscape or known rock art site, geoglyph or toolstone quarry eligible under Criteria a, b or c (State Protocol Agreement VII C. 2), as these sites have not been identified in the project area.	Impacts to archaeological resources and historic properties under Alternative 1 would be same as those described under the Proposed Action.	No archaeological resources or historic properties would be affected by project-related activities under the No Action Alternative.

APE – Area of Potential Effect; BLM – Bureau of Land Management; DEIS – Draft Environmental Impact Statement; EPA – U.S. Environmental Protection Agency
LCWD – Lincoln County Water District; POD – Plan of Development; ROW – right-of-way; NRHP – National Register of Historic Places
SOP – Standard Operating Procedure; SPCCC – Spill Prevention, Containment, Countermeasure, and Control; VRM – Visual Resource Management

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3.0 AFFECTED ENVIRONMENT FOR PROPOSED ACTION AND ALTERNATIVES

This chapter describes the affected environment associated with the Proposed Action and alternatives. The affected environment is the physical area that bounds the environmental, sociological, economic or cultural feature of interest that could be impacted by the Proposed Action or alternatives. When preparing this EIS, the best available information was used to describe existing environments and Proposed Action facilities and activities. The information serves as a baseline from which to identify and evaluate environmental changes resulting from the Proposed Action and Alternatives. The baseline conditions, for the purposes of analysis, are the conditions that currently exist.

In the following sections, the term "project area" refers to the area that encompasses the proposed ROW and associated Proposed Action components, as well as the area immediately adjacent to the proposed facilities. The study area, or Region of Influence (ROI) varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or Alternatives. The Area of Potential Effect (APE), as used in the Archeological Resources and Historic Properties section, is synonymous with the project area.

Based on consideration of the issues raised during the public scoping process, as well as guidance from NEPA, the following critical elements of the environment are considered in the evaluation of the Proposed Action and alternatives.

- Geologic Resources
- Soil Resources
- Water Resources
- Vegetation Resources
- Wildlife Resources
- Land Use
- Areas of Critical Environmental Concern, Wilderness and Other Special Use Areas
- Recreation
- Air Quality
- Noise
- Visual Resources
- Socioeconomics
- Environmental Justice
- Hazardous and Solid Waste
- Paleontological Resources
- Archeological Resources and Historic Properties

The following resources do not occur in the project area and are not addressed further in this EIS.

Wild and Scenic Rivers – There are no federally designated Wild and Scenic Rivers in the project area.

Wild Horses and Burros – There are no wild horses and burros present in the project area.

Prime and Unique Farmlands – There are no prime and unique farmlands in or near the project area.

Indian Trust Assets – There are no Indian Trust Assets in the project area.

3.1 GEOLOGIC RESOURCES

The ROI for geologic resources includes the area adjacent to the proposed ROW, nearby off-site areas subject to disturbance from the Proposed Action or alternatives, and those areas beneath new facilities that would remain inaccessible for the life of the Proposed Action.

3.1.1 Geology

3.1.1.1 Physiography and Topography

The ROI is located within Kane Springs and Coyote Spring Valleys. Kane Springs Valley is an elongated north-northeast/south-southwest trending valley which extends from Coyote Spring Valley, at the southwestern end near Highway 93, to the northeastern end near Elgin. Kane Springs Valley is approximately 40 miles long, with an average width of approximately 8 miles. The floor of the valley slopes south-southwest from an elevation of approximately 4,400 feet on the northeast between the northerly piedmonts of the Meadow Valley and Delamar mountains toward the mouth of the valley, where the elevation is approximately 2,600 feet. The Delamar Mountains to the northwest reach 7,720 feet, while Meadow Valley Mountains to the southeast are considerably lower, with a maximum elevation of 5,676 feet.

The southwestern portion of the ROI is located in the Coyote Spring Valley, which is bounded by the Sheep Range to the west and the Meadow Valley and Arrow Canyon Mountains to the east. The Coyote Spring Valley trends north-south and extends about 37.5 miles from Kane Springs Valley to Hidden Valley. The basin is roughly 8 miles wide.

3.1.1.2 Stratigraphy and Geologic History

The geology of Nevada is the result of millions of years of activity between the North American Plate and various oceanic plates. The activities resulting from historical plate tectonics of folds, thrust faults, strike-slip faults, normal faults, igneous intrusions, volcanism, metamorphism and sedimentary basins have developed the unique geologic characteristics of the region (Page et al. 2003, 2005).

Most of the State of Nevada, as well as portions of adjacent states, is part of an area known as the Great Basin. The eastern portion, in which the project area lies, is characterized by Paleozoic aged - older than 270 million years before present time (or 270 Ma) - alternating sedimentary sequences dominated by clastic rocks with minor amounts of limestone or dolomite, or by carbonate rocks with minor amounts of clastic rocks. The area dominated by carbonate rocks is known as the Carbonate-Rock Province that lies mostly in eastern Nevada and western Utah. Generally, the overall thickness of the carbonate-rock sequences (approximately 5,000 to nearly 30,000 feet) exceeds that of the clastic-rock sequences (Harrill and Prudic 1998).

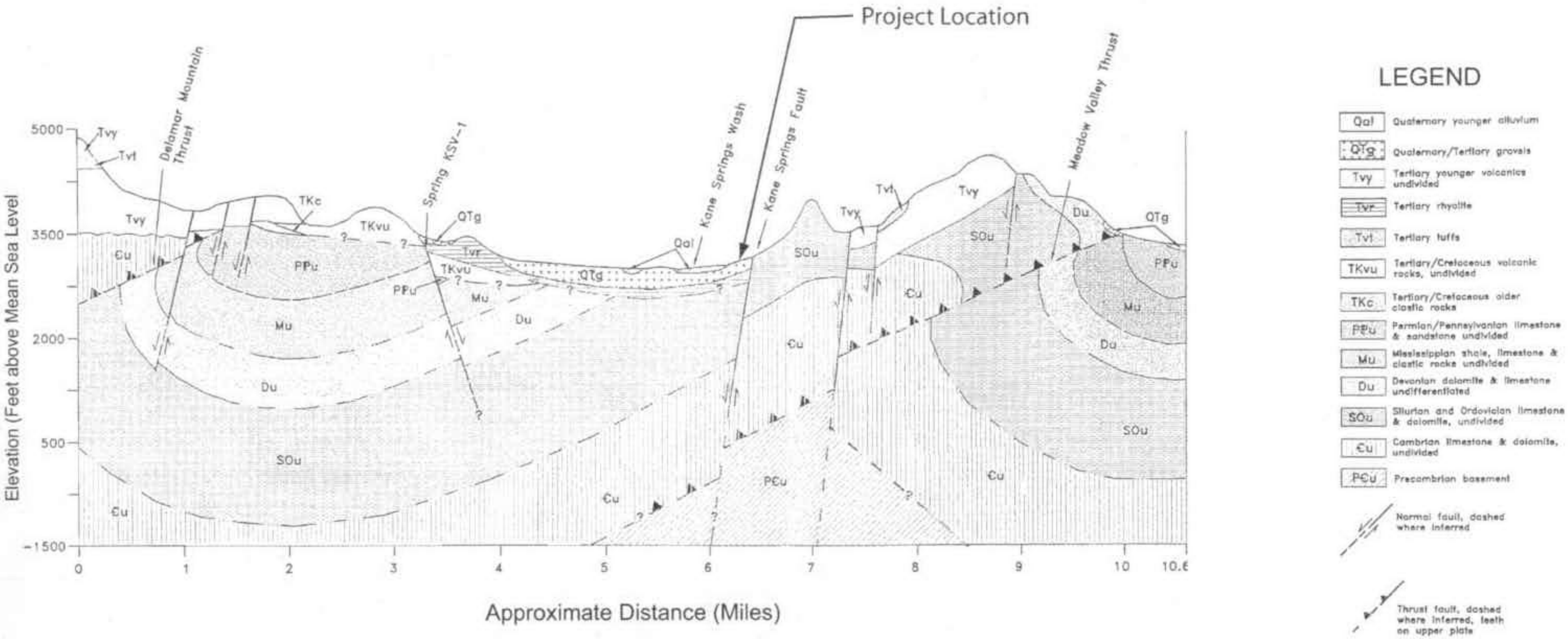
The ROI is also located in the Basin and Range Physiographic Province, characterized by north-to-northeast trending mountain ranges separated by valley basins filled with sediments derived from mountain front erosion. The Basin and Range topography seen today developed during the late Cenozoic Era: approximately 20 Ma. Mountain ranges were uplifted and eroded during this period, resulting in the alluvial sedimentary deposits that fill the resultant basins. Lakebeds and playa deposits were eventually formed as the climate became dryer following the end of alpine glaciation during the late Pleistocene epoch (approximately 10,000 years ago).

On a local scale, Kane Springs Valley is dominated by thick sequences of folded and faulted Paleozoic carbonate rock, intruded and overlain by Tertiary (older than 12 Ma) volcanic rocks and basin fill (Burbey 1997). Most of these volcanic rocks are ash-flow tuffs, which form thin, widespread planar sheets of brittle rock (LVVWD 2001). The carbonate rocks are composed primarily of limestone and dolomite containing varying amounts of silt with interbedded shale (HydroSystems 2000). Carbonate rocks are highly susceptible to dissolution by groundwater. Such dissolution can result in systems of fissures, caves and eventually karst topography.

Several volcanic episodes occurred in the region during the Tertiary period, producing calderas that are discernable today (Noble 1968; Novak 1984, 1985). The Kane Springs Wash Caldera Complex is located in the western central part of the Kane Springs Valley. The caldera complex contains rhyolitic and basaltic flows that are likely to be many thousands of feet thick (Noble 1968; Novak 1984, 1985).

Surficial or overlying basin fill sediments in Kane Springs Valley are 500 to 1,000 feet thick and are composed principally of fine-textured sediments (silt and clay) across much of the basin, except where immediately adjacent to the basin margins in areas of more coarse-textured sediments. These basin fill deposits are characterized as unconsolidated to semi-consolidated fine to coarse clastic material derived from the erosion of the surrounding mountains of predominately volcanic origin (CH2MHILL 2006a; HydroSystems 2000). Lithologic logs from boreholes drilled near the mouth of the basin revealed predominantly microcrystalline carbonate rock (dolostone and limestone), quartzite and clay beneath the basin fill (URS 2006b).

A geologic cross-section of the structural features associated with the Kane Springs Wash Caldera Complex and overall geologic setting of the Kane Springs Valley (prepared by CH2MHILL) is shown in **Figure 3-1.** The cross-section shows the Quaternary/Tertiary gravels beneath Kane Springs Wash and adjacent to the Kane Springs Fault. Beneath the basin fill, layers of undetermined thickness consist of Tertiary rhyolite, Silurian limestone and Cambrian limestone and dolomite.



Horizontal Scale: 1 inch = 5280 Feet
Vertical Scale: 1 inch = 1500 Feet
Vertical Exaggeration = 3.2 Times

Geologic data used to construct cross section by Tschanz and Pampeyan, 1956–1958

Source: Hydrosystems, Inc., 2000

Figure 3-1
Geologic Cross-Section

Kane Springs Valley
Groundwater Development Project

Nearby basins, such as those in the Coyote Spring area, are also underlain by older carbonate rocks (Burbey 1997). Carbonate rock has been estimated to be more than 16,000 feet thick in the Sheep Range area of the western part of the Coyote Spring Valley (URS 2006b). Such carbonate rocks, which are highly fractured and laterally/vertically continuous, are the primary groundwater medium (water-bearing rocks) in the area and provide the principal means of inter-basin groundwater flow (CH2MHILL 2006a). Groundwater flow through fractured carbonate rock and local hydrogeology is discussed further in Section 3.3.3 - Groundwater Resources.

3.1.1.3 Structural Geology

Within the Basin and Range Physiographic Province, the continental crust is continually extending and shearing in response to the motion between the Pacific and North American Plates. This extension results in normal faults that further result in down-thrown blocks (basins), uplifted blocks (mountains), and tilted blocks (combination-mountain and basin) (dePolo et al. 2000). As opposed to normal faults, which involve vertical movement of the crust due to extension, strike-slip faults generally involve no vertical motion, but instead are associated with lateral motion of the crust. Oblique-slip faults are faults in which blocks of rock slip up or down and then past each other diagonally.

There were three dominant structural events that shaped this region. These events include, from the oldest to the most recent, the Sevier orogeny, the Laramide folding and faulting, and the Basin and Range faulting. The Sevier orogeny resulted in the folding, uplift and eastward thrusting of Paleozoic sedimentary rocks. The Laramide faulting resulted in low-angle faults that moved Paleozoic rocks eastward and was also part of a period of uplift, intrusion and compression (ENSR 2004). Basin and Range faulting produced the north-south trending mountain ranges and basins by large-scale movement of crustal blocks (ENSR 2004). Faulting in the Basin and Range Province continues today.

The younger late Cenozoic Basin and Range episode blocked out the present topography into north-striking ranges and intervening basins, which were created by north-striking normal faults. The Basin and Range episode faults in most places obscure the faults and fractures of the older middle Cenozoic episode. Because these faults and the parallel fractures formed by them are recent, they can remain open as conduits for groundwater (LVVWD 2001).

The Pahranagat Shear Zone is located along the northwestern side of the southern Delamar Mountains and continues southwest. It is a left-lateral strike-slip transfer fault zone which connects at both ends with northeast-striking normal faults. This zone, exposed in the Pahranagat Range, forms the western boundary of Pahranagat Valley and is composed of distinct parallel faults including the Arrowhead Mine Fault, Buckhorn Fault and the Maynard Lake Fault. **Map 3-1** identifies faults that occur in the vicinity of the project area. Northeast-southwest trending lineaments have also been mapped in the Arrow Canyon Range and have been identified as deep-seated structural anomalies which may serve as conduits for regional groundwater flow (McBeth 1986, as cited in Kirk and Campana 1990). The northern boundary of the Kane Springs and Coyote Spring Hydrographic Basins along the Delamar Mountains coincides with the southern extent of the Pahranagat Shear Zone.

Pahranagat Shear Zone
Kane Springs Wash Caldera
Maynard Lake Fault
Coyote Spring Fault
Willow Spring Fault
Kane Springs Wash Fault
Sheep Basin Fault
Sheep Range Fault
Buckhorn Fault
Wildcat Wash Fault
Arrowhead Mine Fault
Arrow Canyon Range Fault
Project Area
93
Legend
Shear Zone
Project Area General Location
US Route
Fault
Caldera
Location of Figure 3-1 Geological Cross-Section
Map Extent
Las Vegas
Ely
Geological Formations
Qa Channel Alluvium (Holocene/Pleistocene)
Oldest Alluvium (early Pleistocene to Pliocene)
Tt2 Ash-flow tuffs and interbedded airfall tuffs, unit 2 (Oligocene)
Tt3 Ash-flow tuffs and interbedded airfall tuffs, unit 3 (Miocene and Oligocene)
Ts3 Sedimentary Rocks, Unit 3 (Miocene and Oligocene)
Cc Carrara Formation (Middle and Lower Cambrian)
Chisholm Shale (Middle Cambrian)
Oc Pogonip Group (Middle Ordovician to Upper Cambrian)
Mc Monte Cristo Group of Langenheim and others (1962) (Upper and Lower Mississippian)
Middle Devonian to Silurian rocks, undivided
Sc Silurian and Orovician rocks, undivided
Callville Limestone and related rocks (Lower Permian and Pennsylvanian)
Pc+ Playa Deposits (Holocene to late Pleistocene)
0 2 4 6 8
Miles
Kane Springs Valley Groundwater Development Project
Map 3-1
Faults in the Vicinity of the Project Area
Date: 4.17.07
File: KaneSprings_geology_faults
Author: JAG

The project area is near the Willow Springs Fault and Kane Springs Wash fault zone, which is an area of extensive tectonic activity. The two wells drilled by the LCWD at the south end of the Kane Springs Valley Hydrographic Basin were sited near the point where the Willow Springs fault merges with the Kane Springs Wash fault zone (Swadley et al. 1994). The Willow Springs Fault is a normal fault that bounds the eastern flank of the Delamar Mountains and forms the topographic boundary on the east side of the Kane Springs Valley. The Kane Springs Wash fault zone, located east of the project area, is a left-lateral oblique-slip fault zone (Swadley et al. 1994) affecting both Tertiary (recent) and Paleozoic (older) rocks. Most, if not all, of the motion along this fault zone is considered part of the Basin and Range extensional episode.

3.1.2 Seismicity

The Basin and Range Province is one of the most seismically active regions in the United States. Nevada is the third most active seismic area in the United States, after California and Alaska. Over the last 150 years, an earthquake of Richter scale magnitude 7 or greater has occurred in Nevada approximately every 30 years (Nevada Bureau of Mines and Geology 2006).

Between 1852 and 2006, eight earthquakes of a magnitude greater than 5 have been recorded in the region (UNR 2006). The largest earthquake recorded in the area was a magnitude 6.1 event that occurred in the Clover Mountains in 1966. The most recent earthquake in the region, recorded on June 20, 2006, was a magnitude 4.4 event that occurred near the Town of Alamo. According to recent probabilistic acceleration maps developed by the USGS for southern Nevada, the project area is located in an area with very low potential for earthquakes and associated ground acceleration (USGS 2006).

3.2 SOIL RESOURCES

The ROI for soil resources includes the area adjacent to the proposed ROW and nearby off-site areas subject to disturbance from the Proposed Action or alternatives and those areas beneath new facilities that would remain inaccessible for the life of the Proposed Action.

The ROI is located within Kane Springs Valley and Coyote Spring Valley, adjacent to Kane Springs Road. Landforms within the ROI include drainages associated with the Kane Springs Wash and Pahranagat Wash, fan remnants and piedmont slopes originating from the Delamar Mountain range on the north, and the Meadow Valley Mountain range on the south. Most of the soils located in the ROI are from 12 soil series. Information regarding soil distribution and type was derived from the *Soil Survey Lincoln County, Nevada, South Part* published by the USDA Natural Resource Conservation Service (NRCS 2000).

Soil map units (areas dominated by one or more types of soil) located on fan remnants in the Kane Springs Valley and Coyote Spring Valley include Weiser-Tencee (Map Unit #1001), Tencee-Weiser (1010), Kurstan-Tencee (1020), Kurstan-Knob Hill (1021), Knob Hill-Arizo (1052), and Alko-Arizo (1170). These soils are mostly located within alluvial fans and terraces, and include both shallow and deep soils that are well to excessively drained. Slopes in the ROI are level to gently sloping.

Arizo (1031) and Arizo-Bluepoint (1030) soil associations are found within the drainages of the Kane Springs Wash and Pahranagat Wash. Bluepoint soils are very deep and somewhat excessively drained. Arizo soils are primarily located in drainages that flood occasionally; normally between March and September during large precipitation events.

On the eastern end of the ROI, Geta-Arizo (1100) soil associations are found on piedmont slopes on the north side of the Meadow Valley Mountain Range. In this same area, Canutio-Arizo (1360) soil associations are found southeast of Kane Springs Road. Approximately 1 mile northwest of KPW-1, the Akela-Rock Outcrop (1040) soil association is found on the south side of the Delamar Mountain Range near Kane Springs Road. Immediately south of KPW-1, the St. Thomas-Chinkle-Rock Outcrop (1060) soil association is present on the north side of the Meadow Valley Mountain Range. Each soil series is described in **Table 3-1**.

Table 3-1
Soil Series Descriptions[1]

Name	Location	Slope (%)	Depth	Drainage	Wind Erodibility Group[2]	Surface Texture
Akela	Mountains	15 to 20	Shallow	Well drained	5	Very cobbly sandy loam
Alko	Fan remnants	0 to 15	Shallow	Well drained	2-4	Gravelly sandy loam
Arizo	Drainageways and stream terraces	0 to 8	Very deep	Excessively drained	4	Very cobbly loamy sand
Bluepoint	Dunes	0 to 15	Very deep	Somewhat excessively drained	2	Loamy fine sand
Canutio	Alluvial fans, fan remnants, inset fans	0 to 8	Very deep	Well drained	4-5	Gravelly sandy loam
Chinkle	Mountains	8 to 50	Very shallow	Well drained	5	Very gravelly very fine sandy loam
Geta	Inset fans, stream terraces, fan skirts	0 to 8	Very deep	Well drained	1-4	Very fine sandy loam
Knob Hill	Inset fans	2 to 4	Deep	Somewhat excessively drained	2-5	Loamy sand
Kurstan	Fan remnants	2 to 15	Very deep	Well drained	4	Gravelly sandy loam
St. Thomas	Mountains	15 to 20	Very shallow	Well drained	5-8	Extremely stony fine sandy loam
Tencee	Fan remnants	2 to 30	Shallow	Well drained	5	Very cobbly, sandy loam
Weiser	Fan remnants	2 to 8	Very deep	Well drained	5	Very gravelly sand loam

Source: NRCS 2000

[1] Soil series are groups of soils that have similar characteristics and fall within specific ranges and limitations. They are the lowest category of soil taxonomy and are concepts that represent what the soil actually looks like. Soil map units are geographic areas dominated by one or more soil series and can contain small pockets of soils that are very different from the most prevalent soil series.

[2] Wind erosion hazards are rated by the Natural Resources Conservation Service using wind erodibility groups; soils assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are the least susceptible.

Soil erosion hazards from water are defined based on specific soil properties including texture, structure, permeability and local site conditions such as slope and surface cover. The National

Resource Conservation Service (NRCS) uses K factors (ranging from 0.02 to 0.69) to indicate the susceptibility of a soil to sheet and rill erosion. The higher the value, the more susceptible the soil is to sheet and rill erosion. Within the ROI, most of the soils have low K factors (ranging from 0.05 and 0.20) and are not very susceptible to erosion. The only exception is the Geta soil series, which has a K factor between 0.24 and 0.43 and is moderately susceptible to water erosion.

Wind erosion hazards are rated by the NRCS using wind erodibility groups, which are made up of soils that have similar properties affecting their susceptibility to wind erosion. The soils assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are the least susceptible. Most of the soil series within the ROI are classified in Groups 4 and 5, which are described as moderately erodible. Knob Hill and Bluepoint soils are classified in Group 2, which identifies them as very highly erodible. The Geta soil series is classified in Group 1, which means that they are extremely erodible. These soils are found on fan piedmonts on the eastern end of the ROI.

All soils in the ROI, excluding Geta, Weiser and Kurstan soils, exhibit severe limitations for shallow depth excavation. Shallow depth excavations are trenches or holes dug to a maximum depth of 5 or 6 feet. Depending on the depth to bedrock, slope, and presence of cemented pans, special construction procedures may be required.

Approximately 8 acres of the ROI were burned in the Meadow Valley portion of the Southern Nevada Complex fires in June, 2005. A total of 739,000 acres of land in southern Nevada burned over 19 days, with approximately 148,000 acres of the fire occurring in the Meadow Valley portion of the complex adjacent to Kane Springs Valley. The soils affected by the fire were primarily the Tencee-Weiser association and the Canutio-Arizo association. Very small portions of the Arizo soils and the Kurstan-Tencee association were also affected. Because most vegetation in the burn area has been removed, these areas will exhibit a higher susceptibility to wind and water erosion in the future.

3.2.1 Landslides and Subsidence

Landslides are generally initiated in saturated soil on steep slopes. Slides begin and continue movement on a distinct shear surface that usually forms a relatively impervious layer to the downward percolation of water. This surface may be a bedding plane in solid rock or layers within a soil mantle such as a clay lens. Within the ROI, slopes are primarily level to gently sloping.

Subsidence hazards involve either the sudden collapse of the ground to form a depression or the slow subsidence or compaction of the sediments near the Earth's crust. Carbonate rocks, such as limestone, are highly susceptible to dissolution by groundwater that can result in systems of caves and sinkholes. Caves are underground open spaces formed by dissolution of calcite in the limestone as a result of circulating groundwater. Most caves are thought to form near the water table. A sinkhole is a large dissolution cavity that is open to the Earth's surface. Some sinkholes form when the roofs of caves collapse, others can form at the surface by dissolving the rock downward. Subsidence can also occur following the extraction of large quantities of groundwater; as the pore space within the unconsolidated rock now empty of water is filled with collapsing sediment. No caves or sinkholes have been identified in the ROI; however, numerous caves have been identified throughout eastern Nevada. The regional carbonate aquifer also can be highly fractured in some areas and might contribute to the future formation of cave features.

3.3 WATER RESOURCES

Discussion of water resources is divided into surface water and groundwater. For surface water, the area of delineation is the hydrographic basin, or watershed, which includes the area drained by a stream system and bounded by topographic divides.

For groundwater resources, the area of delineation is defined in terms of 1) groundwater in the underlying rocks or 2) the area of groundwater flow from source areas located either in the bounding mountain ranges or upstream basins toward discharge areas where groundwater is lost to evapotranspiration, discharges to the surface water regime, or flows underground into down-gradient basins.

The ROI for water resources (both groundwater and surface water) includes two separate areas: 1) the area adjacent to the proposed ROW and immediate vicinity and 2) the Kane Springs Valley Hydrographic Basin and adjacent Hydrographic Basins including Delamar Valley (#182), Coyote Spring Valley (#210), and Meadow Valley Wash (#205). Nearby Hydrographic Basins within the ROI include Pahranagat Valley (#209) and Muddy River Springs (#219).

3.3.1 Hydrologic Setting

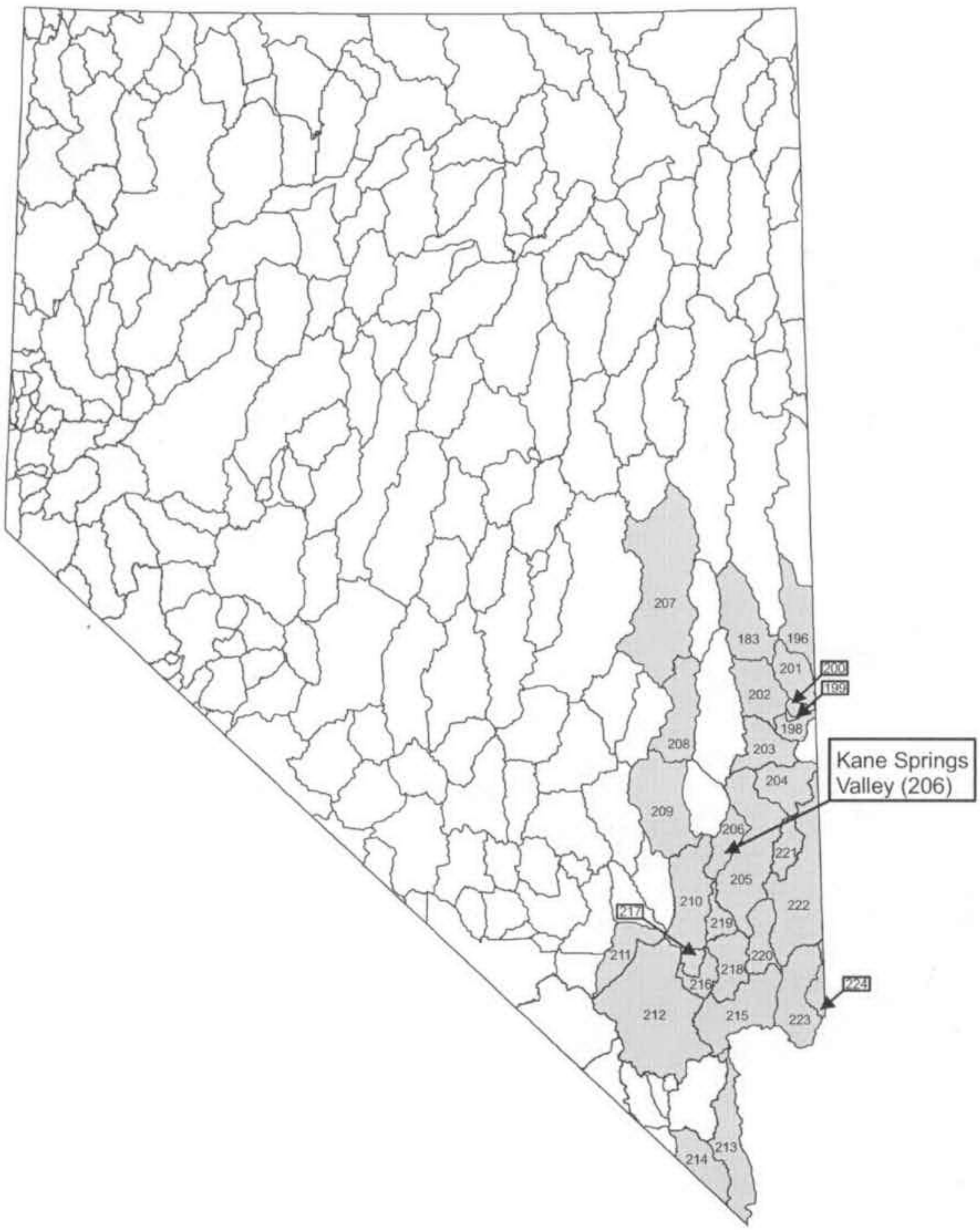
3.3.1.1 Surface Water

The USGS and the Nevada Division of Water Resources have divided the State of Nevada into 14 distinctive hydrologic units called hydrographic regions or basins. Kane Springs Valley is located in the Colorado River Basin Hydrographic Region, which is designated as Basin 13. The 14 principal hydrographic regions are further subdivided into 256 Hydrographic Basins (or Areas) and Sub-areas. The smaller hydrographic areas typically comprise a valley, a portion of a valley, or terminal basin. Kane Springs Valley is located in the Kane Springs Valley Hydrographic Area/Sub-Area (#206) of the Colorado River Basin (**Figure 3-2**).

Map 3-2 shows the Hydrographic Basins adjacent to the Kane Springs Valley Hydrographic Basin. These areas include Delamar Valley (#182) (located upstream to the west), Coyote Spring Valley (#210) (located downstream west and to the south), and Meadow Valley Wash (#205) (located to the east). Nearby Hydrographic Basins included in the ROI include Pahranagat Valley (#209) and the Muddy River Springs Hydrographic Area (#219).

3.3.1.2 Groundwater

From a groundwater perspective, the Kane Springs Valley is located within the Carbonate-Rock Province, a physiographic region that encompasses the eastern half of the Great Basin and includes areas of eastern Nevada, western Utah, and small parts of Arizona and Idaho (Harrill and Prudic 1998). The spatial relationship between the Kane Springs Valley and the Carbonate-Rock Province is illustrated on **Figure 3-3**.



Legend

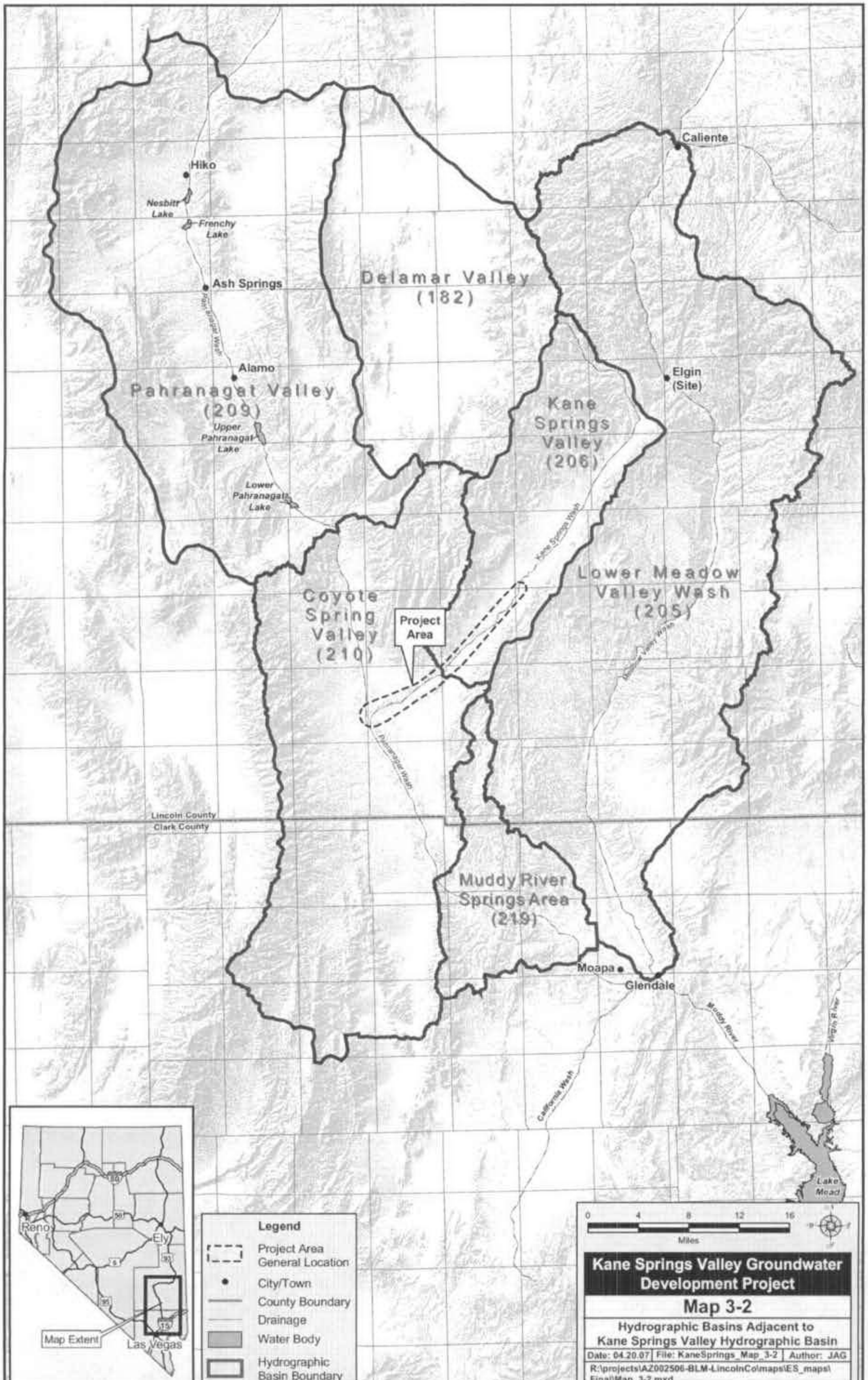
Nevada Watershed

Colorado River Basin

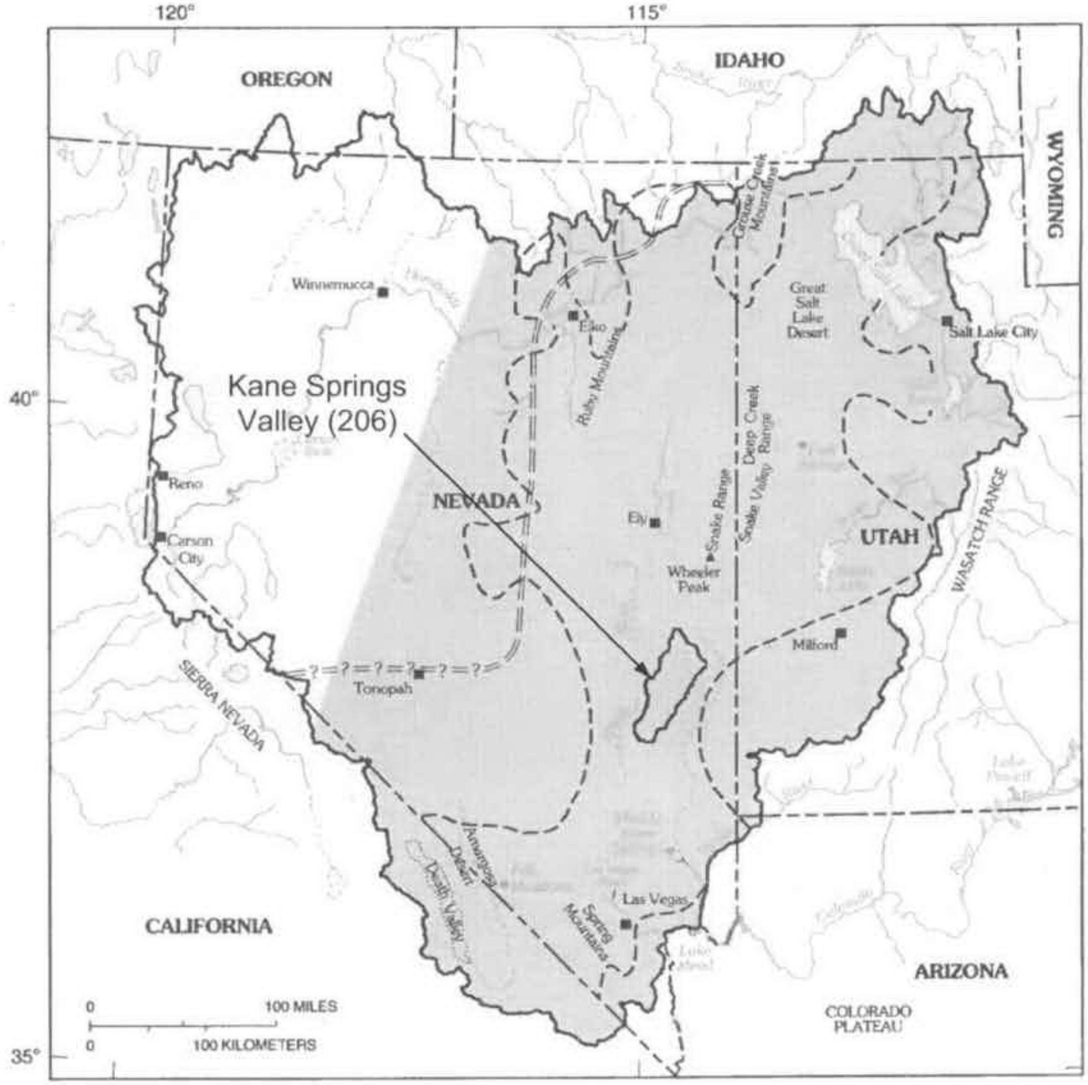
Figure 3-2
Location of Kane Springs Valley (206)
With Respect to Colorado River Basin

Kane Springs Valley
Groundwater Development Project

Source: Nevada Bureau of Land Management, 1999



Caliente
Hiko
Nesbitt Lake
Frenchy Lake
Ash Springs
Delamar Valley (182)
Alamo
Elgin (Site)
Pahranagat Valley (209)
Upper Pahranagat Lake
Lower Pahranagat Lake
Kane Springs Valley (206)
Kane Springs Wash
Lower Meadow Valley Wash (205)
Coyote Spring Valley (210)
Project Area
Meadow Valley Wash
Pahranagat Wash
Lincoln County
Clark County
Muddy River Springs Area (219)
Moapa
Glendale
Muddy River
Virgin River
California Wash
Lake Mead
Reno
Ely
Las Vegas
Map Extent
Legend
Project Area General Location
City/Town
County Boundary
Drainage
Water Body
Hydrographic Basin Boundary
0 4 8 12 16
Miles
Kane Springs Valley Groundwater Development Project
Map 3-2
Hydrographic Basins Adjacent to Kane Springs Valley Hydrographic Basin
Date: 04.20.07 | File: KaneSprings_Map_3-2 | Author: JAG
R:\projects\AZ002506-BLM-LincolnCo\maps\ES_maps\Final\Map_3-2.mxd



Base modified from U.S. Geological Survey digital linegraph data, 1:1000,000 and 1:250,000, 1987
Albers Equal-Area Conic Projection
Standard parallels 29° 30' and 45° 30', central meridian -114°

Source: Prudic, David E., et al, 1995

Legend

Carbonate-rock province study area—Boundary is approximate

Boundary of Great Basin Regional Aquifer-System Analysis (RASA) study area

Approximate boundary of carbonate-rock province—Within province, at least 80 percent of measured sections are composed of more than 50 percent carbonate rock (from Mifflin and Hess, 1979)

Approximate boundary of Roberts overthrust belt—Queried where uncertain

Figure 3-3
Kane Springs Valley in Relation to Carbonate-Rock Province

Kane Springs Valley
Groundwater Development Project

Groundwater resources in Kane Spring Valley are part of the regional White River Flow System first described by Eakin (1966). The White River Flow System includes the area within the drainage divides of six valleys drained by the White River in the Pleistocene age and seven adjacent but topographically separated valleys. The six valleys drained by the ancestral White River include White River, Pahroc, Pahranagat, Kane Springs, Coyote Spring, and Upper Moapa Valleys. From the remaining seven valleys, Delamar Valley is located west–northwest of the Kane Springs Valley. **Map 3-3** depicts the general direction of groundwater flow in the carbonate aquifer within the White River Flow System.

3.3.2 Surface Water Hydrology

3.3.2.1 Climate and Meteorology

The arid climate of the project area reflects the desert environment that characterizes much of southeastern Nevada. Moderate to hot temperatures, low humidity and minimal annual rainfall typify the region. The region actually has four well-defined seasons, although they differ from the traditional view of seasonal variation. Summers display classic southwest desert characteristics. Daily high temperatures typically exceed 100 degrees Fahrenheit (°F) with lows in the 70 °F range. The summer heat is tempered somewhat by the extremely low relative humidity (Eakin 1966).

However, humidity can increase significantly for several weeks each summer in conjunction with moist monsoonal flow from the south, typically during July and August. These conditions can result in desert thunderstorms, which are frequently associated with significant flash flooding and strong downburst winds.

Winters are mild in this region. Afternoon temperatures average near 60 °F, and skies are mostly clear. Pacific storms occasionally produce rainfall in the southern Nevada desert, but in general, the Sierra Nevada Mountains of eastern California act as effective barriers to moisture. Within the study area, the Delamar Mountains (with elevations reaching 7,720 feet) receive most of the local precipitation. The Clover Mountains, east of the Kane Springs Valley, may affect precipitation patterns within the northeastern portion of the valley (Eakin 1966).

Precipitation falls primarily as rain, typically during two different seasons. Most precipitation comes from the regional winter storm systems derived from west and northwest winds. Precipitation is also likely to occur during the summer as a result of generally localized, short-duration, high-intensity convectional storms (thunderstorms fueled by rising warm air masses). These storms may produce significant rainfall. However, rainfall amounts vary considerably from location to location because of the spatial and temporal variation of these types of storm systems. On the local valley floors, most of the precipitation is lost to transpiration and evaporation (Eakin 1966).

Surface evaporation rates run counter to local precipitation amounts and are relatively high. Snow accumulation is rare in the lower desert region. Flurries are observed once or twice during most winters, but snowfall of 1 inch or more occurs only once every 4 to 5 years. However, freezing temperatures do occur regularly (Eakin 1966). **Table 3-2** presents a historical summary of temperature and precipitation for meteorological monitoring stations near the project area.

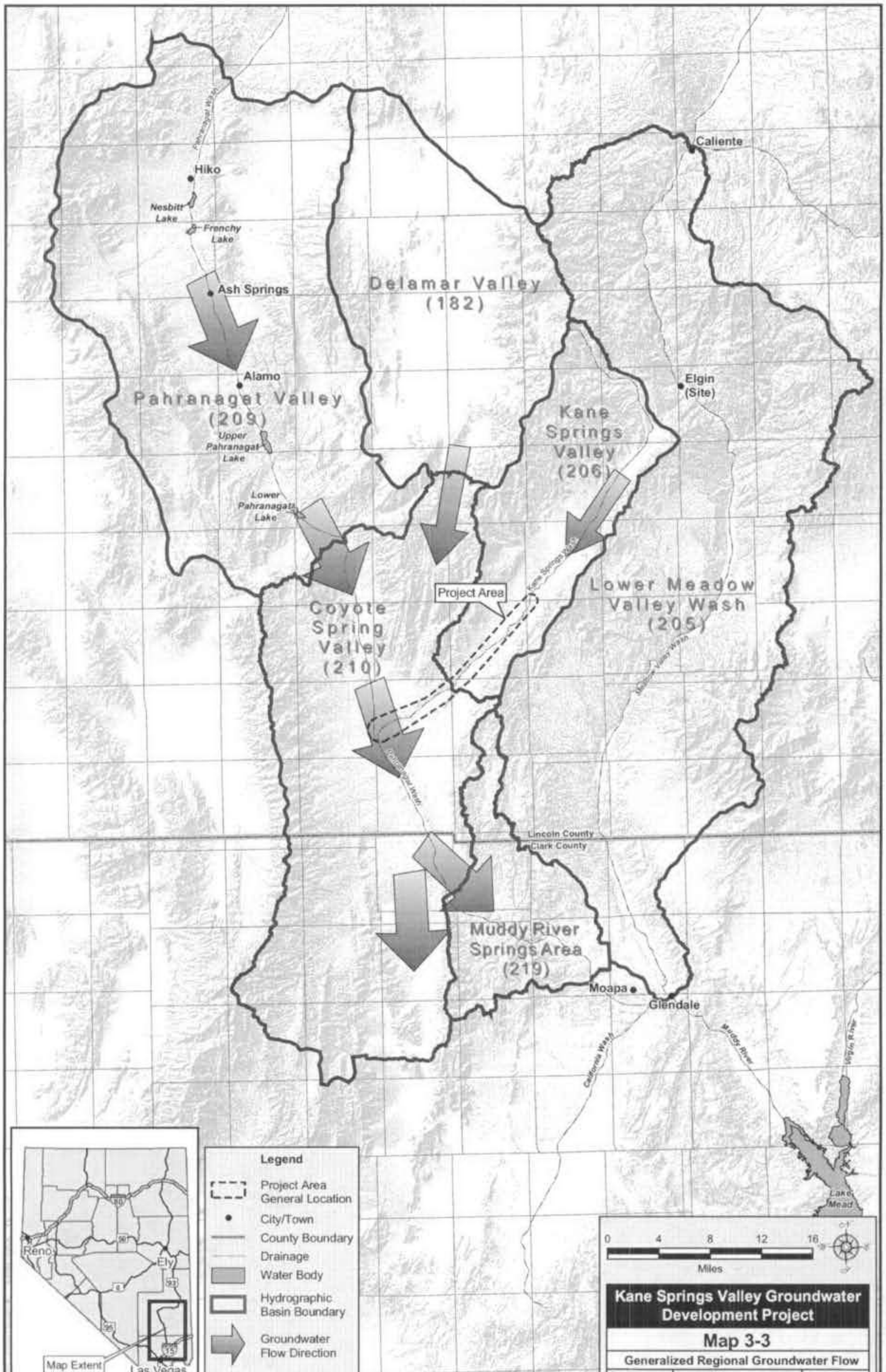

Caliente
Hiko
Nesbitt Lake
Frenchy Lake
Ash Springs
Delamar Valley (182)
Alamo
Elgin (Site)
Pahranagat Valley (209)
Upper Pahranagat Lake
Kane Springs Valley (206)
Lower Pahranagat Lake
Project Area
Lower Meadow Valley Wash (205)
Coyote Spring Valley (210)
Lincoln County
Clark County
Muddy River Springs Area (219)
Moapa
Glendale
Muddy River
California Wash
Lake Mead
Legend
Project Area General Location
City/Town
County Boundary
Drainage
Water Body
Hydrographic Basin Boundary
Groundwater Flow Direction
Source: Modified from CH2MHILL, 2006
Reno
Ely
Map Extent
Las Vegas
0 4 8 12 16
Miles
Kane Springs Valley Groundwater Development Project
Map 3-3
Generalized Regional Groundwater Flow
Date: 11.30.06 File: KaneSprings_Fig_HUC Author: JAG
R:\projects\AZ002506-BLM-LincolnCo\maps\ES_maps\KaneSprings_Fig_HUC.mxd

Table 3-2
Summary of Climatic Statistics in the Vicinity of the Project Area

Location Period of Record	Elevation (feet amsl)	Average Annual Total Precipitation (inches)	Min/Max Avg. Monthly Precipitation (inches)	Min/Max Avg. Monthly Temperature (°F)
Alamo, Nevada 07/02/1948 to 09/30/1962	3,400[e]	4.9	0.07 (Jun) 0.65 (Jan)	20.1 (Jan) 100.3 (Jul)
Pahranagat, Nevada 03/01/1964 to 12/31/2005	3,400[e]	6.4	0.21 (Jun) 0.79 (Mar)	26.5 (Dec) 98.2 (Jul)
Elgin, Nevada (SE) 05/01/1965 to 06/30/1985	3,300[e]	14.1	0.14 (Jun) 2.52 (Mar)	30.7 (Dec and Jan) 100.1 (Jul)
Elgin, Nevada 03/01/1951 to 12/31/2005	3,400[e]	12.5	0.35 (Jun) 2.10 (Feb)	27.8 (Dec) 98.6 (Jul)

[e] Estimated
Source: Western Regional Climate Center 2006
amsl – above mean sea level
SE – southeast

Strong winds can occur during the spring and fall seasons. Winds stronger than 50 miles per hour are infrequent but can occur with some of the more vigorous storms. Winter and spring wind events often generate widespread areas of blowing dust and sand. Strong wind episodes in the summertime are usually connected with thunderstorms, and are thus more isolated and localized. Prevailing wind direction is typically southwesterly unless associated with a thunderstorm outflow. Surface winds are characterized by prevailing southwesterly winds with an average speed of approximately 10 miles per hour (Eakin 1966).

3.3.2.2 Surface Water Features

With the exception of a few low-flow springs in the foothills of the Delamar Mountains (described in Section 3.3.2.3), there is no surface water in the Kane Springs Valley. Water within the valley occurs below the basin fill material at depths greater than 900 feet bgs. The carbonate aquifer, where pumping would occur under the Proposed Action, begins at approximately 1,400 feet below the surface.

Kane Springs Wash, a normally dry, ephemeral wash, only flows during large precipitation events. Small washes, originating in the surrounding Delamar and Meadow Valley Mountain Ranges direct localized surface runoff into Kane Springs Wash, which discharges into the Pahranagat Wash near Highway 93.

Pahranagat Wash, also a normally dry, ephemeral wash, is the principal surface water drainage feature in the Coyote Spring Valley and upstream Pahranagat Valley Hydrographic Basin. Pahranagat Wash runs from the north (Pahranagat Valley) to the south and southeast, where it joins Arrow Canyon Wash before joining the Muddy River in the upper Moapa Valley.

There are no perennial surface water features in the upstream Delamar Valley. The only perennial surface water features in the Pahranagat Valley are the Pahranagat and Nesbitt Lakes.

The principal surface water drainage in the Pahranagat Valley is the ephemeral Pahranagat Wash. Several other ephemeral drainages present in Delamar and Pahranagat Valleys usually flow only in response to precipitation events. Potenital connection between the perennial surface water features in Pahranagat Valley and regional groundwater system in Kane Springs Valley (target for pumping) would likely be hindered by their location (upgradient), great depths to the regional aquifer, distance to pumping wells, and the presence of the Pahranagat Shear Zone, which according to Burbey (1997) represents a partial barrier to southward-trending groundwater flow.

The only perennial streams in the region are the Meadow Valley Wash, which is located approximately 30 miles east of the project area, and the Muddy River, which is located approximately 28 miles south of the project area. Meadow Valley Wash is incised through volcanic rocks in the northern part and primarily through basin fill deposits in the southern part of the Lower Meadow Valley Wash Hydrographic Basin. Surface water in the Lower Meadow Valley Wash Hydrographic Basin is not connected to that of Kane Springs or Coyote Spring Valleys as they are separated by the Meadow Valley Mountains topographic divide. Meadow Valley Wash trends southward to the Muddy River, which connects to Lake Mead and the Colorado River. South of the 37 degree North latitude, Meadow Valley Wash becomes ephemeral due to pumping, evapotranspiration and infiltration along its course (Burbey 1997). No streamflow data are available for either Kane Springs Wash or Pahranagat Wash. The nearest streamflow measurements were available from two downstream USGS monitoring stations located on the Muddy River near Moapa and Glendale. Streamflow statistics for these stations are summarized in **Table 3-3.**

Table 3-3
Streamflow Statistics for USGS Monitoring Stations

Station Name	Muddy River near Moapa, NV	Muddy River near Glendale, NV
Station Number	9416000	9419000
Drainage Area (mi^2)	3,820	6,780
Period of Record	1944-2005	1950-2005
Mean Annual Flow (cfs)	41.1	42.8
Highest Annual Mean (cfs)	49.6 (1958)	72.2 (2005)
Lowest Annual Mean (cfs)	30.4 (2004)	30.4 (1997)
Maximum Peak Flow (cfs)	5,760 (8/16/1990)	16,400 (8/10/1981)

cfs - cubic feet per second
mi^2 - square miles
NV - Nevada
USGS – U.S. Geologic Survey
Source: USGS 2005a

3.3.2.3 Local Springs

Two types of springs occur in or near the Kane Springs Valley: (1) local springs, which are recharged by precipitation that are not connected to deep underlying groundwater and (2) regional springs, which are partially derived from the carbonate aquifer and are outside of the project area. Local springs are described in this section, while the regional springs are discussed in Section 3.3.3.4.

There are several small springs in the mountains and hills surrounding the Kane Springs Valley. The springs include Willow, Kane, Boulder, Narrow Canyon, Sawmill, and Upper and Lower Riggs Springs, which are located primarily north and west of the project area (CH2MHILL 2006a). These springs are generally low-flowing (less than 0.02 cubic feet per second [cfs]).

A few studies have been performed to identify the characteristics and source of the water discharging from local springs. Eakin (1964) identified six small–yield springs located along the Delamar Range and Meadow Valley Mountains in the Kane Springs Valley area. These springs include Kane, Grapevine, Willow, Cabin and two unnamed springs that issue from, or are adjacent to, volcanic rocks. The first three, along with several others, are discussed by CH2MHILL (2006b). Eakin proposed that these springs are supplied by groundwater moving through fractures in the volcanic rocks and that the groundwater is partly perched as the result of either differential permeability among volcanic rock units or faulting.

Based on the more recent isotope studies, local springs, including Upper Riggs, Boulder, Kane, Grapevine and Willow Springs, were found to be recharged by local precipitation, and the water likely travels a relatively short distance before discharging to the surface. Deuterium abundance in water from these local springs contrasts with values of deuterium that correspond to deep, regionally flowing groundwater in the carbonate aquifer systems (CH2MHILL 2006b).

3.3.2.4 Surface Water Quality

Section 303(d) of the federal Clean Water Act requires states to develop a comprehensive list of waterbodies that are impaired by point or non-point sources. Section 303(d) also requires that states develop Total Maximum Daily Loads (TMDLs) for all of their impaired waters.

There are no perennial streams within the project area. Within the region, Nevada's 2004 303(d) list of water-quality-limited streams lists the segment of Muddy River from its source to Glendale (approximately 12 miles from the project area) as impaired from iron, temperature and total phosphorus and the segment from Glendale to Lake Mead as impaired from boron, iron and temperature (NDEP 2005). There are currently no TMDLs associated with Muddy River (NDEP 2005). No other streams in the vicinity of the project area are listed as impaired on Nevada's 2004 303(d) list of water-quality-limited streams.

Nevada's water quality standards, contained in the NAC 445A.118 – 445A.225, define the water quality goals for a waterbody by: 1) designating beneficial uses of the water and 2) setting criteria necessary to protect the beneficial uses. These standards are designated Class A through Class C depending on the degree of degradation from pristine conditions. The designated beneficial uses for the Muddy River include irrigation, watering of livestock, recreation not involving contact with water, industrial supply, propagation of wildlife and propagation of aquatic life (NDEP 2003).

The waters in Pahranagat Lake and Nesbitt Lake, both located within the upstream Pahranagat Valley Hydrographic Basin, are designated as Class C (NAC 445A.126). The beneficial uses of Class C water are municipal or domestic supply (or both following complete treatment), irrigation, watering of livestock, aquatic life, propagation of wildlife, recreation involving contact with the water, recreation not involving contact with the water and industrial supply (NDEP 2003). These lakes are located more than 25 miles north of the project area.

3.3.3 Groundwater Resources

3.3.3.1 Regional Setting

The carbonate-rock aquifer that underlies most of southern Nevada occupies part of what is known as the Carbonate-Rock Province, a physiographic region that encompasses the eastern half of the Great Basin and includes areas of eastern Nevada and western Utah as well as the Death Valley area of California and small parts of Arizona and Idaho (Schaeffer et al. 2005).

Since the early 1960s, the geologic and hydrologic properties of the carbonate-rock aquifer have been the subject of numerous studies by a range of federal, state and local agencies. More recently, a collaborative study has been undertaken to better understand and evaluate regional groundwater flow systems in eastern Nevada as directed by Section 131 of the LCCRDA of 2004. This latter project, known as the Basin and Range Carbonate Aquifer System Study (BARCASS), involves the USGS, the Desert Research Institute (DRI), and the Utah State Engineer's Office. The BARCASS study area includes portions of northern Lincoln County and White Pine County. It does not include the basins discussed in this EIS.

3.3.3.2 Groundwater Occurrence

Within the regional carbonate aquifer, groundwater occurs in sediments that have filled the valleys to their current elevations (basin-fill deposits) and the underlying rock that also comprises the surrounding hills and mountains. Groundwater is, therefore, stored and conveyed through two principal aquifer systems: 1) saturated, poorly consolidated shallow basin-fill deposits and 2) the underlying fractured sedimentary carbonate (limestone, dolomite) or volcanic (tuff, rhyolite, basalt) rocks (Eakin 1966).

In general, the basin-fill aquifer systems are localized and relatively shallow. Groundwater in these deposits generally flows in directions that coincide with decreasing ground surface elevations. Groundwater can flow among hydrographic areas or basins where the basin-fill deposits from adjacent areas merge (Eakin 1966).

A statewide analysis of shallow inter-basin flows was conducted for the Nevada State Engineer by the USGS in 1971. This study indicated that 35 AFY of groundwater flowed from Pahranagat Valley into the upper Coyote Spring Valley. A small portion of this water was thought to flow eastward into Kane Springs Valley. It was also estimated that groundwater flow from Delamar Valley into Kane Springs Valley was as much as 500 AFY (USGS 1971). More recent studies indicate that higher flow may be occurring through Kane Springs Valley, and these results are discussed in detail in Section 3.3.3.3.1.

The underlying fractured-rock and carbonate aquifer systems, on the other hand, are regional features in which groundwater flows irrespective of the local topography and hydrographic area boundaries. Previous studies have shown that groundwater in the deep fractured-rock systems flows in response to regionally controlled hydraulic gradients driven by regional recharge and discharge areas and is generally not significantly influenced by conditions in the overlying basin-fill aquifer systems (USGS Professional Papers 1409-A through H; Harrill and Prudic 1998). In addition, although individual rock formations are laterally discontinuous and typically highly deformed structurally, the basic rock types are essentially continuous and transcend the boundaries of the hydrographic areas. As a result, it is very difficult, if not impossible, to place lateral bounds around the fractured-rock aquifer systems (Dettinger 1992).

The Kane Springs Valley and Coyote Spring Valley Hydrographic Basins are located within the southeastern edge of the Carbonate-Rock Province (Dettinger et al. 1995, Plume 1996). Within the Carbonate-Rock Province, groundwater flow is strongly influenced by the carbonate-rock aquifers formed during the Paleozoic age. Dominated by limestones and dolomites, the carbonate rocks in this region are brittle and subject to fracturing and, under the right geochemical conditions, can dissolve and form cavities that further enhance the ability of these rocks to store and transmit groundwater. The large geographic area underlain by these carbonate rocks, together with their demonstrated capacity to transmit large volumes of groundwater, is evidence that the carbonate rocks of Nevada comprise aquifer systems of regional scale and significance (Dettinger et al. 1995).

The total volume of groundwater that flows through these aquifers over the entire Carbonate-Rock Province has been estimated by the USGS to be about 1.5 million AFY, which represent only 3 percent of the estimated total precipitation. The study also estimates that approximately 1.2 million AFY are discharged by evapotranspiration, and 211,000 AFY are discharged as regional spring flow from the carbonate aquifer. Within the White River subregion of the Colorado River Basin, the flow through the carbonate aquifer is estimated by the USGS to be approximately 150,000 AFY. Simulated underflow from Pahranagat Valley and adjacent Tikaboo Valley to Muddy River Springs is reported to be 24,000 AFY (Prudic et al. 1995).

Eakin (1964) stated that the amount of groundwater in storage within the basin fill and underlying carbonate rocks was relatively large and could provide a reserve for maintaining withdrawal during protracted periods of drought. The exact volume is unknown and depends on the thickness and porosity of the sediments. The thickness has been estimated to be between 1,000 and 16,000 feet, while the average porosity may be less than 10 percent. Groundwater storage in the carbonate rocks beneath Kane Springs, Coyote Spring, and Muddy River Springs was estimated by Burbey (1997) at 8.7 million acre-feet. Of this, 80 percent occurs within the Coyote Spring Valley.

The Pahranagat Shear Zone is suggested to be a partial barrier to southward-trending groundwater flow, as evidenced by higher groundwater elevations north of the fault zone (Burbey 1997). The groundwater elevation decreases almost 1,000 feet across the shear zone, based on December 2005 data (Faunt 2006).

Burbey (1997) evaluated hydrogeology and potential for groundwater development in carbonate-rock aquifers in southern Nevada based on depth to water, depth to and thickness of carbonate rocks, and water quality. Based on these criteria, Burbey identified potentially favorable groundwater development areas including eastern Pahranagat and Coyote Spring Valleys, southernmost Delamar Valley and eastern Lower Meadow Valley Wash.

A geochemical and isotopic evaluation was conducted by Thomas et al. 1996, and updated in 2001. These results indicated that:

- The White River Flow System acts as one continuous carbonate-rock aquifer from Long Valley in the north to Upper Moapa Valley (Muddy River Springs area) in the south.
- The results of the deuterium isotope and geochemical mass-balance model of the White River Flow System are consistent with 53,000 AFY of groundwater flowing out of Coyote Spring Valley to the Muddy River Springs area in Upper Moapa Valley (37,000 AFY) and to the south-southeast in the carbonate-rock aquifer (16,000 AFY).
- The deuterium isotope composition of water discharging from Big Muddy Spring, the largest discharging spring in the Muddy River Springs area, was used to calculate a deuterium water mass-balance budget for the sub-regional flow system. This budget showed that, for a Muddy River Springs area discharge rate of 36,000 AFY, the sources would be 14,000 AFY of recharge from the Sheep Range, 14,000 AFY of inflow from Pahranagat Valley, and 8,000 AFY of inflow from the Lower Meadow Valley Wash-Kane Springs Valley area.

3.3.3.3 Local Hydrogeology

Recent studies have been conducted to describe the local groundwater conditions in the Kane Springs and Coyote Spring Hydrographic Basins (Burbey 1997; Hydrosystems 2000; CH2MHILL 2006a, 2006b; and URS 2006a, 2006b). The local hydrogeology is discussed in the following sections.

3.3.3.3.1 Kane Springs Valley

In the Kane Springs Valley Hydrographic Basin, groundwater occurs principally in the deep fractured rock aquifer, which includes primarily volcanic and carbonate material. The basin-fill deposits in the Kane Springs Valley are the products of the erosion of the surrounding mountains, which are mainly volcanic in origin. These volcanic rocks readily weather to fine-textured sediments (silt and clay). Such sediments typically have low values of hydraulic conductivity, inhibiting the flow of water. As a result, the basin-fill deposits are generally not favorable for the development of laterally continuous aquifer units, although these deposits are undoubtedly locally saturated over some depth interval at least seasonally. Thickness of basin-fill deposits in Kane Springs Valley is approximately 200 feet (URS 2006a, Hydrosystems 2000).

The fractured-rock groundwater medium in Kane Springs Valley is composed of both local volcanic and regionally occurring carbonate rocks. Volcanic rocks of the Clover and Delamar Mountains, which are composed of various ash-flow tuffs, rhyolite and basalt, typically do not support development of a significant aquifer system because of heterogeneous intrinsic permeability and the general lack of continuous faulting and folding structures. Fractured and faulted volcanic rocks, however, do provide local conduits for groundwater to recharge into the deeper (carbonate) aquifer system.

Inflow to Kane Springs Valley from the Delamar Mountains, and the area to the northeast is influenced by both the Willow Springs Fault and the presence of a large volcanic caldera complex in the subsurface of the central portion of the valley (Page et al. 2005). Page's maps show the presence of extensive Paleozoic carbonate units south of the Kane Springs caldera that could serve as conduits for groundwater flow. In addition, the high transmissivity for the KPW-1 well discussed below indicates that the Willow Springs Fault is highly conducive to groundwater flow.

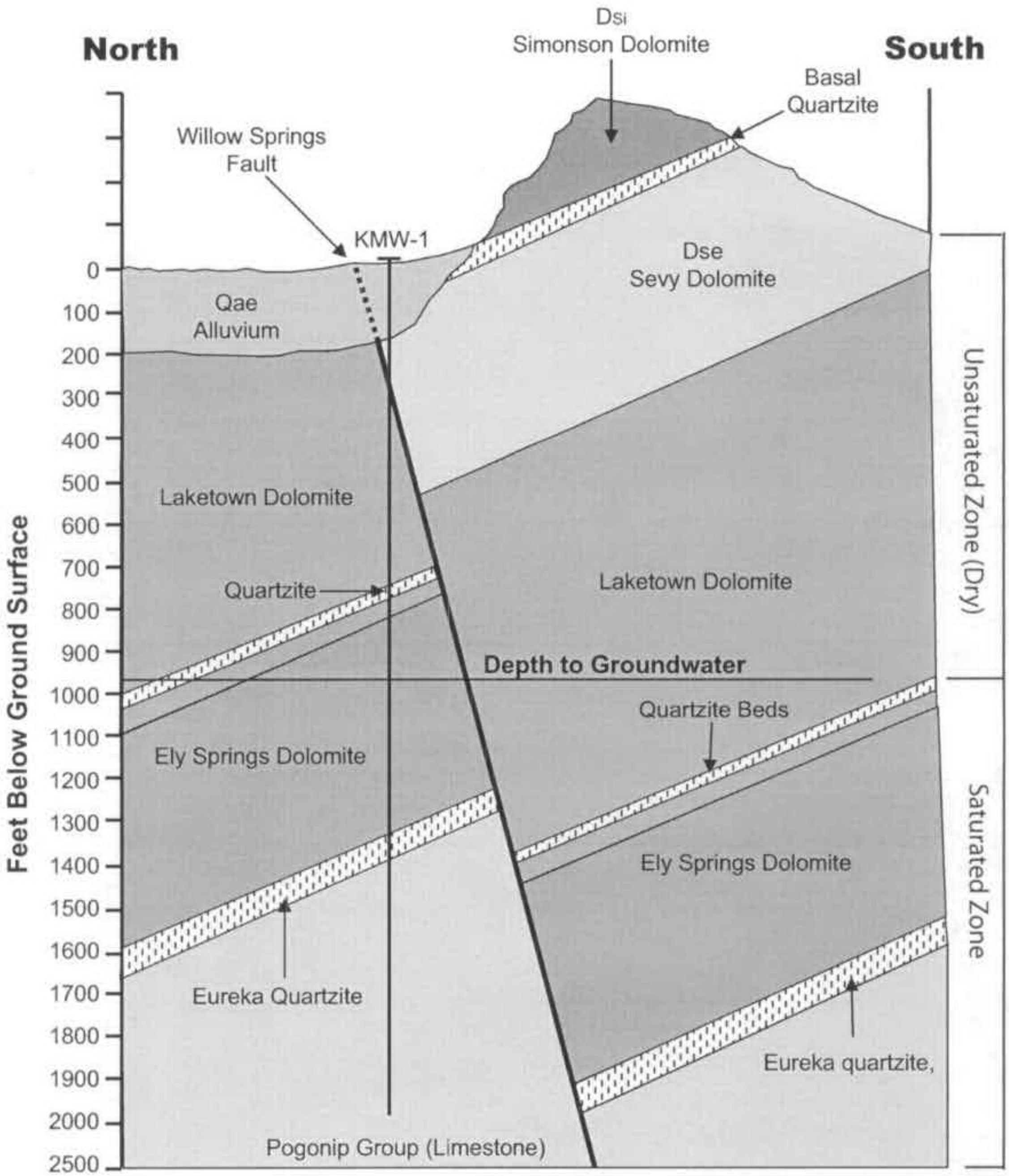
Carbonate rocks, which are highly fractured and laterally/vertically continuous, are the primary groundwater media in Kane Springs Valley and provide the principal means of inter-basin groundwater flow from Kane Springs Valley. In the lower portion of the Kane Springs Valley, carbonate rock units are estimated to be more than 16,000 feet thick (CH2MHILL 2006a). The test well discussed in the next paragraph (KPW-1) was drilled to a depth of 2,000 feet bgs and encountered fractured carbonate between 1,400 and 2,000 feet bgs (URS 2006a). The two reports cited above and discussed below represent the only direct measurements of subsurface conditions within the Kane Springs Valley Hydrographic Basin. The Nevada State Engineer evaluated these data and a full discussion of that evaluation is presented below.

To evaluate aquifer characteristics and potential for groundwater development of the fractured carbonate rock in the Kane Springs Valley, the LCWD drilled a production/test well (KPW-1) and a monitor well (KMW-1) in the south end of the Kane Springs Valley Hydrographic Basin. The wells are located at an elevation of 2,870 feet above mean sea level (amsl). The geologic setting for KMW-1 well is shown in **Figure 3-4**. The figure also illustrates the depth to carbonate groundwater in the area.

Depth to water in KPW-1 and KMW-1 in January 2006 was measured at 992 and 997 feet bgs, respectively. Two values of transmissivity were determined based on the results of aquifer testing. Results from 7-day sustained aquifer test pumping, including the various methods of aquifer test analysis, are summarized in detail in CH2MHILL (2006a). Based on these results, the transmissivity representing the "regional" aquifer varied between approximately 30,000 and 80,000 gallons per day per foot (gpd/ft), and the transmissivity for the zone associated with the local Willow Springs Fault was estimated to be on the order of 300,000 gpd/ft (URS 2006b). Using the screen length of the well (1,025 feet) to represent the aquifer thickness and an average transmissivity of 50,000 gpd/ft, hydraulic conductivity is calculated at 6.5 ft/day (URS 2006b).

In general, hydraulic conductivities of carbonate rocks vary greatly depending on the matrix, small and large fractures, and fault zones. Generally, permeability is greater where there are large openings or fault zones. Dettinger et al. (1995) reported hydraulic conductivities from 39 fractured carbonate rock wells in southern and eastern Nevada with ranges from 0.01 to 940 ft/day. Thus the value of 6.5 ft/day, determined for well KPW-1, is consistent with previous measurements.

Additionally, review of water levels combined with aquifer testing suggests that the Kane Springs Wash fault zone extending southward into the Coyote Spring Valley likely impedes, but does not inhibit the flow across the fault zone and has the potential to limit the impacts from pumping wells as a function of distance from the fault (CH2MHILL 2006a).



Not To Scale
Source: CH2MHILL, 2006

Figure 3-4
Localized Cross-Section
Through KMW-1, Kane Springs Valley

Kane Springs Valley
Groundwater Development Project

Groundwater in the deep carbonate aquifer flows from north to south across the study area, specifically from Pahranagat Valley and Kane Springs Valley into Coyote Spring Valley, and into the Muddy River Springs Area (CH2MHILL 2006a). Groundwater flow through Kane Springs Valley was approximated by CH2MHILL (2006a) using the transmissivity values from aquifer testing and an estimated regional horizontal hydraulic gradient that would represent regional gradient driving the flow into the basin. The CH2MHILL study estimated that the regional groundwater flow into the Kane Springs Valley to be 13,000 AFY. Estimated local recharge within the Kane Springs Valley is to be on the order of 5,000 AFY. Consequently, the total groundwater inflow to Kane Springs Valley was estimated at 18,000 AFY. Groundwater discharge from Kane Springs Valley into the Coyote Spring Valley was estimated at 16,000 AFY (CH2MHILL 2006a).

The CH2MHILL (2006a) study also concluded that at least 15,000 AFY flow through the aquifer system of Kane Springs Valley Hydrographic Basin, and the perennial yield is on the order of 5,000 AFY based on the recharge analysis developed by Walker. These results are appreciably higher than the earlier estimate of 35 AFY for the shallow inter-basin flow (USGS 1971) and total recharge to Kane Springs and Coyote Spring of 2,600 AFY (Eakin 1966). New methods for estimating recharge in desert environments are currently being investigated (Flint et al. 2004, Meyers 2007). However, such estimates are still undergoing peer and agency review and have not been directly applied to the Kane Springs Valley area (Stonestrom et al. in press, Hogan et al. 2004).

The CH2MHILL (2006a, 2006b) studies were presented in support of applications 72218 through 72221, filed by the LCWD for the appropriation of underground waters, at hearings conducted by the Nevada State Engineer on April 4 through 6, 2006. Following these hearings and review of both the older regional and the newly acquired data, the Nevada State Engineer permitted up to 1,000 AFY of groundwater from Kane Springs Valley (February 2007, Ruling 5712). The text of the ruling is provided in **Appendix B**. The ramifications of this recent ruling for the Proposed Action are dicussed further in Section 4.3. The ruling found that the Applicant, as supported by data from CH2MHILL (2006a, 2006b), Hydrosystems (2000), and URS (2006a, 2006b), did not provide sufficient information to warrant the approval of the 5,000 AFY originally requested. As part of the ruling, the State Engineer did not accept several of the recent results from the Applicant's studies cited in the above paragraphs and instead relied primarily on the older work of the Nevada State Engineer's Office and Eakin (1964). The following summarizes the findings, with respect to the hydrogeologic conditions, in ruling 5712. The State Engineer finds:

- *...the Applicants' interpretation of ground-water movement in the Kane Springs Valley from northeast to southwest and into Coyote Spring Valley, preferentially along the Kane Springs Wash fault zone, is generally consistent with the available data.*

- *...the Applicants' pumping test supports the conclusion that there is considerable potential for ground-water flow in the carbonate rocks in the vicinity of well KPW-1.*

- *...sufficient data does not exist to substantiate or reliably estimate subsurface flows into the Kane Springs Valley Hydrographic Basin.*

- *...reinterpretation of the Applicants' outflow analysis resulted in approximately 2,250 acre-feet per year of basin outflow.*

- *...the Applicants' inflow and outflow analyses lack sufficient data to provide a reliable estimate of basin boundary flows. The State Engineer finds that sufficient data were not collected or presented to substantiate the Applicants' estimate of subsurface flow into or out of the Kane Springs Valley Hydrographic Basin.*

- *...applying the percentages of regional carbonate groundwater from KPW-1 for both the deuterium and oxygen-18 samples, the local ground-water recharge component of the outflow would therefore be approximately 518 acre-feet per year and 293 acre-feet per year reapectively. These values appear to support the reconnaissance estimate of 500 acre-feet per year of recharge, however it is recognized that the re-interpreted outflow is only an estimate, and its value is limited due to uncertain hydraulic parameters.*

- *...the Applicants'evidence and testimony lack the scientific and practical basis to substantiate the proffered recharge of 5,000 to 14,000 acre-feet annually. However, the State Engineer also recognizes that the current reconnaissance estimate of average annual recharge is probably low. The State Engineer finds recharge in Kane Springs Valley is uncertain, but is likely greater than the reconnaissance estimate of 500 acre-feet per year and less than the Applicant's estimates of 5,000 to 14,000 acre-feet per year.*

- *...believes a small amount of water can be developed in the Kane Springs Valley and not unreasonably impact existing rights in the discharge areas of the White River carbonate-rock aquifer system, which are already fully appropriated.*

- *...finds that 1,000 acre-feet is a reasonable amount to allow for appropriation from Kane Springs Valley.*

- *...finds by limiting the quantity of water authorized for appropriation, the potential impacts to existing rights in down-gradent hydrographic basins will be minimized.*

- *Testimony was provided that indicated conservation measures are in place for the planned development* (CSI) *similar to traditional development measures associated with development in southern Nevada that have been adopted and imposed, and there is no evidence that the appropriation of water from Kane Springs Valley will damage the environment of the Kane Springs Valley.*

- *...finds there is not substantial evidence that the appropriation of a limited quantity of water in Kane Springs Valley Hydrographic Basin will have any measurable impact on the Muddy River Springs that warrants the inclusion of Kane Springs Valley in Order No. 1169.*

- *...finds there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs.*

- *...concludes that to permit the appropriation of water in an amount greater than permitted under this ruling will conflict with existing rights and threaten to prove detrimental to the public interest.*

The final conclusion of this ruling reflects the State Engineer decision based on the most current data available at the time of the ruling. This decision does not preclude applicants from obtaining water rights in Kane Springs Valley Hydrographic Basin in the future. As additional pertinent hydrological data becomes available, the Nevada State Engineer may award additional water rights in the Kane Springs Valley.

3.3.3.3.2 Coyote Spring Valley

Aquifer systems present in Coyote Spring Valley include basin-fill deposits, volcanic and the carbonate-rock aquifer. The basin-fill aquifer in the area is composed of poorly graded interbedded silty clays and light tan to brown sands with gravels. Basin fill directly overlies carbonate rocks in most areas, and thicknesses generally range from approximately 70 feet near the edges of the valley to more than 300 feet in the middle (URS 2006a). Volcanic deposits in the area are composed of pale grey to pinkish devitrified tuff with common quartz and felsic phenocrysts. A rather sharp transition from volcanic to carbonate rocks occurs in the northern part of Coyote Spring Valley (Burbey 1997).

The carbonate-rock aquifer is the largest water-bearing formation within the Coyote Spring Valley. It is composed of layered dolostone and limestone with lenses of detrital shale. Thicknesses of carbonate rocks have been measured to be more than 10,000 feet in the Sheep Range, located in the western part of the Coyote Spring Valley (Guth 1981). Depths to water in the fractured carbonate-rock aquifer vary between 430 and 1,084 feet bgs (URS 2006a). Dettinger et al. (1995) reported hydraulic conductivities from two carbonate wells between 630 and 900 ft/day.

Local recharge to groundwater in the Coyote Spring Valley comes from direct precipitation on the surrounding upland areas. This recharge is augmented by deep through-flowing water in carbonate rocks beneath Pahranagat and White River Valleys in the north and Delamar and Kane Springs Valleys in the northeast (Burbey 1997). Discharge from this area is almost entirely by spring discharge at Muddy River Springs, which was estimated by Eakin and Moore (1964, as cited in Burbey 1997) to be 36,000 AFY. Groundwater storage in carbonate rocks beneath Kane Springs, Coyote Spring and Muddy River Springs was estimated by Burbey (1997) at 8.7 million acre-feet. Of this total, about 80 percent occurs within the Coyote Spring Valley.

3.3.3.4 Springs

Several springs of regional importance lie outside of the immediate project area. These include the Muddy Springs, located approximately 28 miles southeast of the project area within the downstream Muddy River Springs Hydrographic Area, and a series of springs that rim the Overton Arm of Lake Mead (including Rogers and Blue Point – approximately 56 miles southeast of the project area).

Several studies have been performed to identify the characteristics and source of the water discharging from the springs in southeastern Nevada. Eakin (1964) evaluated the origin of water from the springs by analyzing variations and magnitude of the spring flow and the chemical character of water issuing from principal springs in the area. Based on the fact that the discharge from Muddy River Springs was highly uniform, and chemical water quality was apparently better than that from the basin-fill aquifer, he concluded that the discharge from Muddy River Springs is being supplied from a large regional groundwater system (Eakin 1966).

A modeling study by Prudic et al. (1995) also concluded that groundwater flow to large regional springs, such as Muddy River Springs, is through permeable carbonate rocks that transmit water from distant recharge areas beneath intervening mountains and valleys.

In support of the LCWD's water rights applications, CH2MHILL presented an updated version of their geochemical studies to the Nevada State Engineer in April 2006 (CH2MHILL 2006b). Information regarding the average percentage of regional carbonate groundwater in local wells and springs based on deuterium isotope mass-balance studies is provided in the CH2MHILL study. The results indicate that 82 percent of the water in well KPW-1 comes from the carbonate aquifer, and 18 percent is from local recharge. At the other extreme, for Rogers and Blue Point Springs, between 39 percent and 50 percent and between 42 percent and 53 percent, respectively, is groundwater from the carbonate aquifer. **Table 3-4** shows the results of the deuterium isotope mass-balance study.

Table 3-4
Average Percent Carbonate Groundwater in Regional Wells and Springs

Well / Spring	Carbonate Water (%)
Pahranagat	60
KPW-1	82
Coyote Spring	55
Garnet	58
Muddy River Springs Area	62
Big Muddy Springs	60
Meadow Valley Wash	38
California Wash	61
Rogers Spring	39 - 50
Blue Point Spring	42 - 53

Source: CH2MHILL 2006b

Average annual flow rates monitored by USGS at Muddy Springs (including Warm, Pederson, East Pederson and Muddy) range from 0.21 to 7.77 cfs (USGS 2005a). Total discharge from springs in this area was estimated by Eakin and Moore (1964, as cited in Burbey 1997) to be 36,000 AFY and represents a major component of Muddy River stream flow. Burbey further states that these springs represent the single greatest groundwater discharge point in southern Nevada. The latest study from CH2MHILL (2006b) calculates that approximately 62 percent of the water in the Muddy River Springs Area is derived from the regional carbonate aquifer. The Nevada State Engineer examined the above calculations (Ruling 5712, summarized in section 3.3.3.3.1), and while disagreeing with some of the CH2MHILL calculations, concluded that "there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs".

3.3.3.5 Groundwater Quality

Historical groundwater quality data from the Kane Springs Valley are limited. No water quality data are available from basin-fill and fractured carbonate rock units. The concentration of total dissolved solids (TDS) provides a general indication of water quality. Water quality data from three wells completed in volcanic rocks indicated relatively good water quality, with TDS concentrations varying between 475 and 715 milligrams per liter (mg/L) (HydroSystems 2000).

In January 2006, eight groundwater wells were sampled by URS to characterize the groundwater quality of basin-fill, volcanic, and carbonate-rock aquifers within Coyote Spring Valley. The analytical results and corresponding drinking water standards are summarized in **Table 3-5.** Extensive testing was also conducted on test well KPW-1 (located in Kane Springs Valley) during the aquifer test.

Table 3-5
Summary of Groundwater Quality Data Groundwater Wells in Coyote Spring Valley

Parameter (mg/L)	Units	CSVM-2	CSVM-3	CSVM-4	CSVM-5	CSVM-6	CSVM-7	CSV-3	CSI-1	Drinking Water Standards
Well source	--	Carbonate	Carbonate	Carbonate	Carbonate	Carbonate	Volcanic	Fill	Carbonate	--
Well Depth	ft bgs	1,425	1,220	2,842	1,783	1,200	610	780	935	--
Depth to Water	ft bgs	748	442	967	1,084	430	445	589	439	--
Bicarbonate	mg/L	190	240	260	20	250	170	170	305	NS
Calcium	mg/L	86	46	ND	45	46	38	51	53.5	NS
Chloride	mg/L	57	29	53	18	35	21	22	37	250 [a]
Fluoride	mg/L	1.5	1.3	**4.6**	0.69	2.2	1.1	0.99	2.02	4
Magnesium	mg/L	31	20	0.82	30	19	15	26	22.6	NS
Potassium	mg/L	15	12	15	NA	14	9.9	NA	11.9	NS
Silica	mg/L	27	44	ND	22	34	35	21	32	NS
Sodium	mg/L	60	71	140	220	73	44	33	80.6	NS
Sulfate	mg/L	210	73	120	52	93	46	55	102	250 [a]
TDS	mg/L	**620**	430	**550**	320	470	300	370	420	500 [a]
Aluminum	mg/L	ND	ND	NA	ND	ND	ND	ND	0.058	0.05-0.2 [a]
Arsenic	mg/L	ND	0.0095	0.005	ND	0.0097	**0.012**	**0.01**	0.015	0.01
Iron	mg/L	**3.3**	NA	NA	NA	**1.9**	NA	NA	**2.94**	0.3 [a]
Nickel	mg/L	NA	NA	NA	ND	NA	NA	ND	ND	NS
Manganese (dissolved)	mg/L	0.047	ND	**0.097**	0.029	0.021	0.037	0.047	NA	0.05 [a]

Notes:
NA – Not Analyzed
ND – Not Detected
NS – No Standard
a – secondary drinking standard
bold values represent exceedances
TDS – total dissolved solid
mg/L – milligrams per liter
ft/bgs – feet below ground surface

In general, the data indicate relatively good water quality from all three aquifers. For depth-specific samples, TDS values in carbonate-rock aquifer ranged from 320 to 620 mg/L, while TDS from basin-fill and volcanic aquifers were both below the federal drinking water standard of 500 mg/L. Fluoride and iron concentrations exceeded the drinking water standards from carbonate-rock aquifer samples, while arsenic was measured at above the drinking water standard in both basin-fill and volcanic rock water samples (URS 2006a). The sample from KPW-1 collected under flowing conditions yielded 46 micrograms per liter (ug/L) of arsenic and a TDS of 653 mg/L. Both of these values exceed their respective EPA primary and secondary drinking water standards.

3.3.4 Water Supply, Use and Water Rights

Nevada water law is set forth in the NRS Chapters 532 through 538. The Nevada Water Resources Division, headed by the Nevada State Engineer, is responsible for the administration and enforcement of Nevada's water law. This includes overseeing the permitting and appropriation, adjudication, distribution and management of the state's surface and groundwater. Nevada water law requires that an Applicant provide evidence of an actual beneficial use for the water right applied for (NRS § 533.035). The Applicant must satisfactorily prove to the Nevada State Engineer that unappropriated water is sufficient for the intended beneficial use with reasonable due diligence including the financial ability to construct a water development Proposed Action (NRS § 533.035).

3.3.4.1 Surface Water

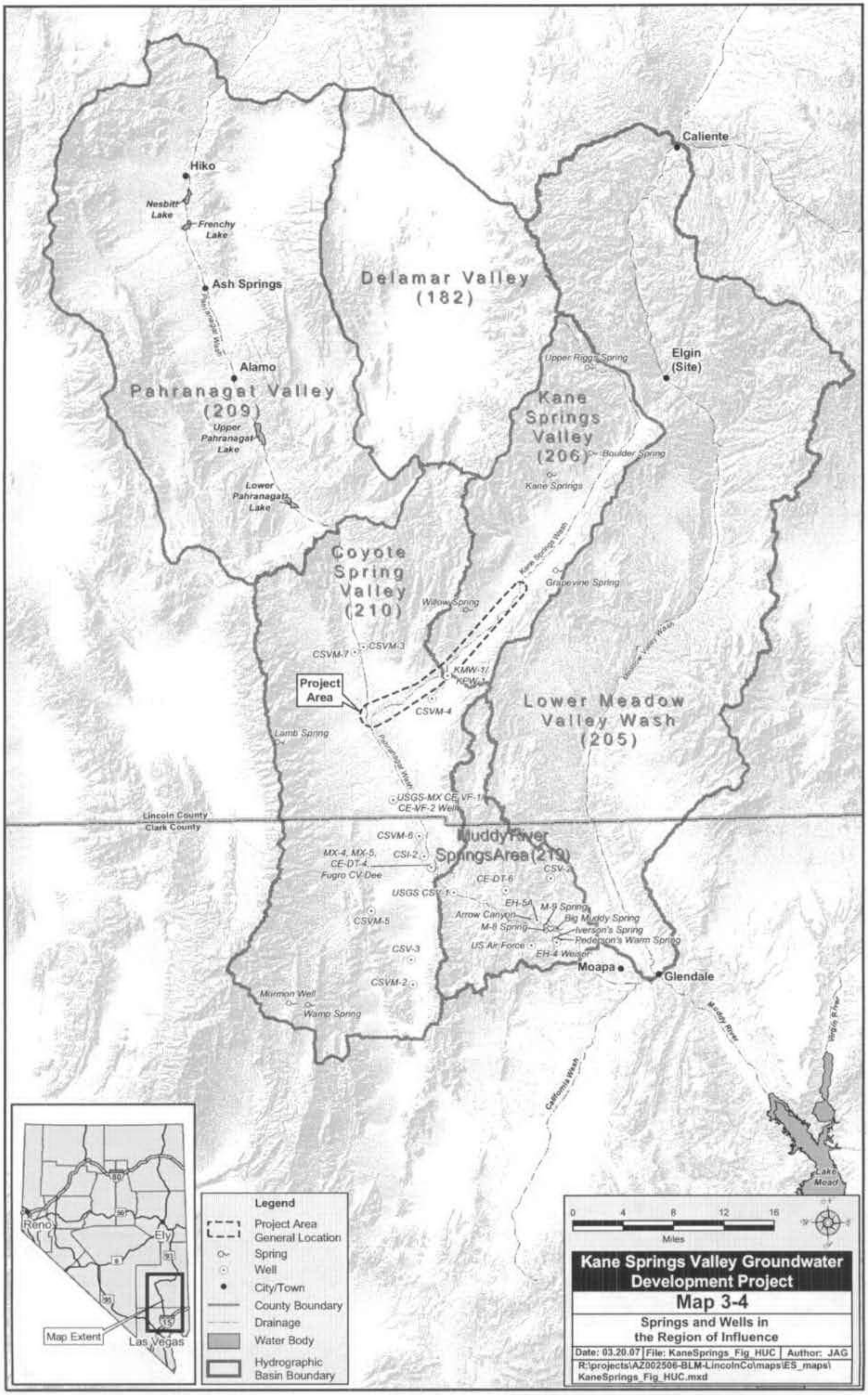
As described in Section 3.3.2.2, with the exception of a few low-flow springs, there is no surface water in the Kane Springs and Coyote Spring Hydrographic Basins. A list of surface water rights within the two basins is provided in **Appendix D**. All surface water rights are certified or vested exclusively for stock water use near springs and dammed reservoirs.

3.3.4.2 Groundwater

Groundwater wells within the Kane Springs Valley and Coyote Spring Valley Hydrographic Basins are associated with municipal, mining, industrial, commercial and irrigation use. Permitted diversion rates for existing wells vary from 0.2 to 10 cfs (145 to 7,242 AFY). Within the Kane Springs Valley Hydrographic Basin, permitted water rights include the recently approved the LCWD applications under Ruling 5712. The LCWD has an additional four groundwater applications pending before the Nevada State Engineer.

In the Coyote Spring Valley Hydrographic Basin, groundwater rights filed with the Nevada State Engineer include 15 industrial use permits owned by Southern Nevada Water Authority (SNWA), four municipal use permits owned by the CSI, one industrial use permit owned by Nevada Power Company, and four permits owned by Bedrock Limited, LLC associated with sand and gravel mining operations. Bedrock Limited, LLC also has one vested application for irrigation use. The locations of water rights in or near the ROI are shown on **Map 3-4**.

There are 34 pending applications by Las Vegas Valley Water District; CSI; Dry Lake Water, LLC; and Bedrock Limited, LLC in the Coyote Spring Valley Hydrographic Basin. A list of surface water and groundwater rights in the Kane Springs Valley and Coyote Spring Valley Hydrographic Basins is provided in **Appendix D**.


Caliente
Hiko
Nesbitt Lake
Frenchy Lake
Ash Springs
Delamar Valley (182)
Alamo
Pahranagat Valley (209)
Upper Pahranagat Lake
Lower Pahranagat Lake
Elgin (Site)
Upper Riggs Spring
Kane Springs Valley (206)
Boulder Spring
Kane Springs
Kane Springs Wash
Grapevine Spring
Coyote Spring Valley (210)
Willow Spring
CSVM-7
CSVM-3
KMW-1/
Project Area
CSVM-4
Lower Meadow Valley Wash (205)
Meadow Valley Wash
Lamb Spring
Pahranagat Wash
USGS-MX CE VF-1/
CE-VF-2 Well
Lincoln County
Clark County
CSVM-6
Muddy River Springs Area (219)
MX-4, MX-5,
CE-DT-4
Fugro CV Dee
CSI-2
CE-DT-6
CSV-2
USGS CSV-1
EH-5A
M-9 Spring
Arrow Canyon
Big Muddy Spring
M-8 Spring
Iverson's Spring
Pederson's Warm Spring
US Air Force
EH-4 Weiser
CSVM-5
CSV-3
CSVM-2
Moapa
Glendale
Mormon Well
Wamp Spring
Muddy River
Virgin River
California Wash
Lake Mead
Reno
Ely
Map Extent
Las Vegas
Legend
Project Area General Location
Spring
Well
City/Town
County Boundary
Drainage
Water Body
Hydrographic Basin Boundary
0 4 8 12 16
Miles
Kane Springs Valley Groundwater Development Project
Map 3-4
Springs and Wells in the Region of Influence
Date: 03.20.07 | File: KaneSprings_Fig_HUC | Author: JAG
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Permitted water rights, as well as estimated perennial yields for hydrographic basins in the ROI and adjacent basins of interest, are summarized in **Table 3-6**. Three of these areas (Lower Meadow Valley Wash, Coyote Spring and Muddy River Springs) are classified as "designated basins". The Nevada State Engineer defines designated groundwater basins as "basins where permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration. Under such conditions, a state's water officials will so designate a groundwater basin and, in the interest of public welfare, declare preferred uses (e.g., municipal and industrial, domestic, agriculture, etc.)."

Table 3-6
Perennial Yield and Water Rights in ROI and Hydrographic Areas of Interest

Hydrographic Basin	Designated Basin[1]	Perennial Yield[2] (AFY)	NDWR Permitted Annual Duty[3] (AFY)
Pahranagat Valley	N	25,000	9,123
Delamar Valley	N	3,000	7
Lower Meadow Valley Wash	Y	5,000	23,625
Kane Springs Valley	N	1,000[4]	1,000[4]
Coyote Spring Valley	Y	18,000	16,304
Muddy River Springs	Y	37,000	13,328

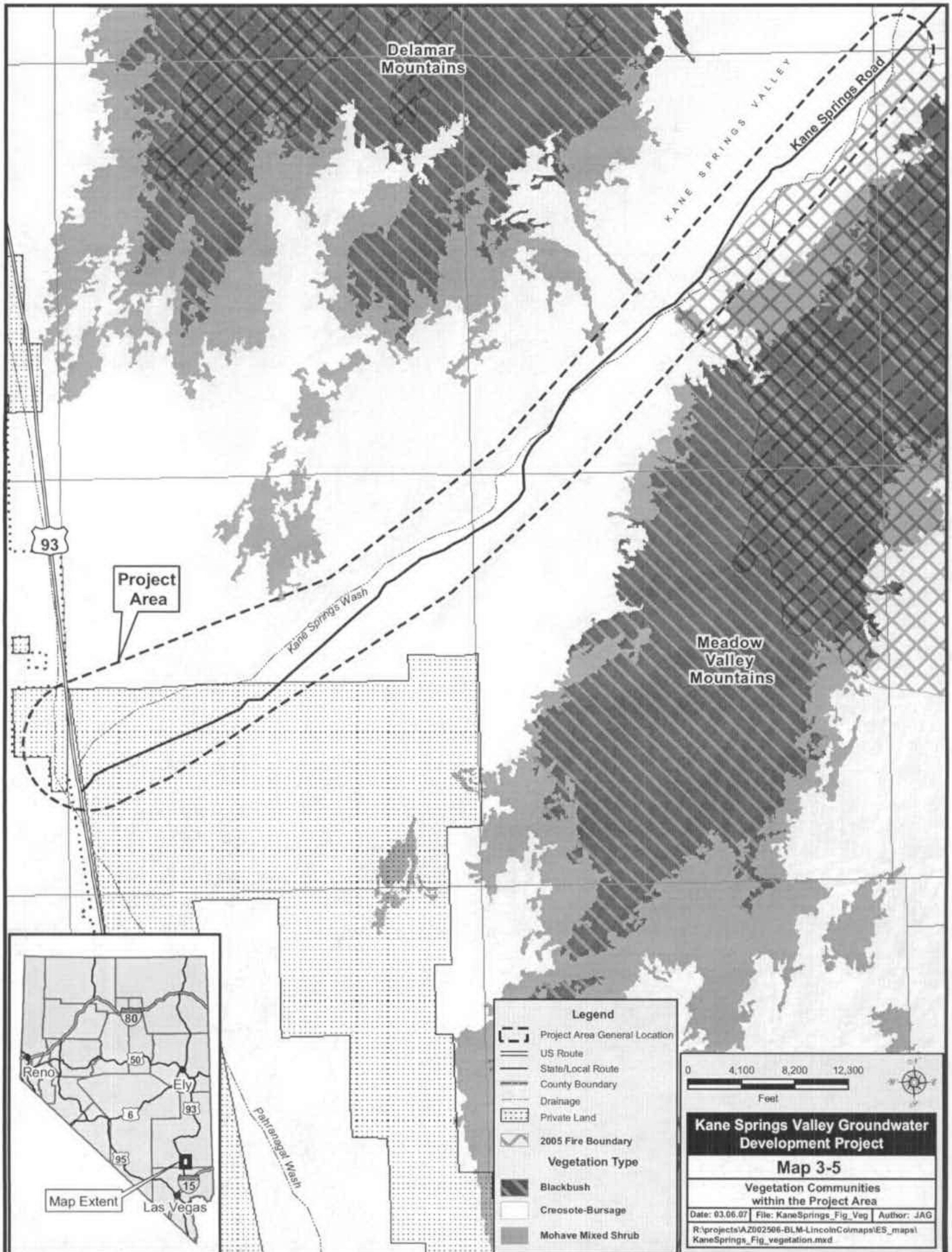
[1] NDWR 2005
[2] NDWR 1992
[3] Permitted water rights reported as Annual Duty in AFY (NDWR 2007a)
[4] Nevada State Engineer Ruling 5712 February 2007 (NDWR 2007b)
AFY – acre-feet per year; ROI – Region of Influence; NDWR – Nevada Department of Water Resources

3.4 VEGETATION

The project area is located in the Mojave Desert biome, and the ROI for vegetation resources consists of the entire width of the temporary disturbance corridor (100 to 150 feet). 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 at elevations lower than 4,000 feet. Mojave Desert Wash Scrub habitat is restricted to sandy arroyos and washes at elevations below 5,000 feet.

3.4.1 Mojave Creosote Bush Scrub

This vegetation class includes Mojave mixed scrub and creosote-bursage vegetation that is dominated by widely spaced shrubs that usually have bare ground between them **(Map 3-5)**. Dominant and associate species within this vegetation community are listed in **Table 3-7**.



Delamar Mountains
KANE SPRINGS VALLEY
Kane Springs Road
93
Project Area
Kane Springs Wash
Meadow Valley Mountains
Pahranagat Wash
Reno
80
50
Ely
93
6
95
15
Map Extent
Las Vegas
Legend
Project Area General Location
US Route
State/Local Route
County Boundary
Drainage
Private Land
2005 Fire Boundary
Vegetation Type
Blackbush
Creosote-Bursage
Mohave Mixed Shrub
0 4,100 8,200 12,300
Feet
Kane Springs Valley Groundwater Development Project
Map 3-5
Vegetation Communities within the Project Area
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Author: JAG
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Table 3-7 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*
Engelmann's hedgehog cactus	*Echinocereus engelmannii*
California barrel cactus	*Ferocactus cylindraceus* var. *cylindraceus*
Common fishhook cactus	*Mammilaria tetrancistra*
Beavertail cactus	*Opuntia basilaris*
Silver cholla	*Opuntia echinocarpa*
Diamond cholla	*Opuntia ramosissima*
Mojave prickly-pear	*Opuntia erinacea*
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 large wildland fires 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 wildland fires in eastern Nevada has increased in recent years as a result of changes in land use practices (e.g., reduced livestock grazing) and human-caused climate change (BLM 2000). In June 2005, fires burned approximately 8 acres of the ROI in the Meadow Valley portion of the Southern Nevada Complex. A total of 739,000 acres of land in southern Nevada burned over 19 days, with approximately 148,000 acres of the fire occurring in the Meadow Valley portion of the complex, adjacent to Kane Springs Valley. The disturbance caused by fire has allowed for an increased presence of non-native grassland. This non-native grassland provides a more continuous fuel load than that in adjacent unburned areas. Overall, the change from native vegetation, such as scattered shrubs interspersed with forbs, perennial grasses and some succulents, to a non-native annual grassland increases susceptibility of the area to future wildland fires.

3.4.2 Mojave Desert Wash Scrub

The Mojave Desert Wash Scrub community consists of scrubby vegetation, the occurrence of which is restricted to along 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).

3.4.3 Non-native Invasive Species and Noxious Weeds

Noxious weeds are defined under Nevada law (NRS 555.005) as any species of plant that is or is likely to be detrimental or destructive and difficult to control or eradicate. They are also defined by the U.S. Department of Agriculture Animal and Plant Health Inspection Service under the Federal Noxious Weed Act. Noxious weeds are those weed species that are included on the State of Nevada noxious weed list (NDA 2006). Non-native invasive species are those species that are undesirable and exhibit similar ecological risks as noxious weeds, but are not listed on the federal or Nevada noxious weeds lists.

Related to field studies for this EIS, biological field crews were tasked to note the presence of noxious and non-native invasive plant species within the project area. Prior to conducting field surveys of the Proposed Action and Alternative 1 alignments, biologists reviewed the Federal Noxious Weed List (USDA 2006), BLM National List of Invasive Weed Species of Concern (BLM 2006b), and Nevada State Noxious Weed List (Invasive.org 2006). Although formal noxious weed inventories were not conducted for the analyses in this EIS, information from other inventories conducted in nearby areas between 2001 and 2004 located Russian knapweed (*Acroptilon repens*), tamarisk (*Tamarix* spp.), and whitetop (*Lepidium draba*) (BLM 2006a).

Field observations found large populations of cheatgrass (*Bromus tectorum*) and red brome in the burn area, which is located in the northeast portion of the project area. This species also occurs sporadically within shrublands throughout the project area (ARCADIS 2006a). Cheatgrass is highly invasive and is the fuel most commonly associated with the chance of ignition and rate of spread of wildland fires in Nevada. The maturation of cheatgrass in the late spring or early summer (as opposed to native grasses, which mature in late summer and early fall) extends the fire season into the hottest months of the year. The dense growth and fine texture of cheatgrass provide for a continuous fuel source to spread wildland fires (Young and Clements 2006).

Non-native grassland occurs in the project area as an understory community within shrublands. This vegetative type also occurs in the area that was affected by the wildland fire in 2005. Dominant grass species include primarily red brome, cheatgrass and Mediterranean grass. The area that was burned in 2005 represents an area of disturbance that favors the spread and establishment of noxious and invasive weed species (Waggoner 2007). Non-native annual grasses increase the risk of fire and often increase in dominance after fire events.

Other common non-native invasive species that may occur in the project area are listed in **Table 3-8**. Of these species, Russian knapweed, perennial pepperweed, salt cedar, whitetop and Sahara mustard are listed on the Nevada Noxious Weed List (NDA 2006).

Table 3-8
Non-Native Invasive Plant Species That May Occur in the Project Area[1]

Common Name	Scientific Name
Red brome	***Bromus rubens***
Cheatgrass	***Bromus tectorum***
Mediterranean grass	***Schismus spp.***
Russian knapweed*	*Acroptilon repens*
Perennial pepperweed*	*Lepidium latifolium*
Whitetop*	*Lepidium draba*
Redstem filaree	*Erodium cicutarium*
Salt cedar*	*Tamarix spp.*
Sahara mustard*	*Brassica tournefortii*
Russian thistle	*Salsola tragus*

[1] Species in bold font are known to occur within the project area. Asterisks designate species that are listed on the Nevada List of Noxious Weeds (NDA 2006)

3.4.4 Federally Threatened, Endangered and Candidate Plant Species

As a component of the ESA Section 7 consultation process, a list of Threatened and Endangered plant species that may occur in or near the project area was obtained from the USFWS on May 8, 2006 (Williams 2006). This list indicated that no Threatened, Endangered or Candidate plant species were known to occur in or near the project area (**Appendix E-1**).

3.4.5 Special Status Plant Species

For the purposes of this EIS, special status plant species in the project area include Nevada BLM sensitive species, State of Nevada classified species, and protected species of cactus and yucca. The BLM sensitive species exclude taxa that are federally listed, proposed or Candidate species or State of Nevada classified species. The BLM policy is to provide these species with the same level of protection as is provided for species that the USFWS lists as Candidate species (BLM Manual 6840.06 C). This level of protection functions to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed". The sensitive species designation is assigned to species that occur on the BLM-administered lands for which the BLM has the capability to significantly affect its conservation status through management. The BLM Manual 6840.06 E provides factors by which a native species may be listed as sensitive. These include:

1) Could become endangered or extirpated from a state, or within a significant portion of its range, in the foreseeable future;
2) Is under status review by the USFWS and/or National Marine Fisheries Service;
3) Is undergoing significant current or predicted downward trends in:
    a. Habitat capability that would reduce a species' existing distribution and/or
    b. Population or density such that federally listed, proposed, Candidate, or state listed status may become necessary

4) Typically consists of small and widely dispersed populations;
5) Inhabits ecological refugia, or specialized or unique habitats; or
6) Is state-listed, but may be better conserved through application of the BLM sensitive species status.

Forty-six Nevada BLM sensitive plant species were listed (July 2003) as potentially occurring within the BLM Ely District (**Appendix E-2**). Prior to initiating field work conducted by ARCADIS biologists, each of these species was reviewed in coordination with the BLM biologists to assess for presence of potential suitable habitat (e.g., soil, elevation, vegetation community associations) within the project area. Twenty-one BLM sensitive plant species were identified as potentially occurring within the project area (see **Table 3-9**). Information on habitat requirements for each of these species (see **Table 3-9**) was obtained from the Nevada Natural Heritage Program Nevada Rare Plant Atlas, Rare Plant Fact Sheets (Nevada Natural Heritage Program 2001, 2005a, 2005b).

Table 3-9
Nevada BLM Sensitive Plant Species that May Occur In or Near the Project Area

Common Name (*Scientific Name*)	Habitat
White bearpoppy *Arctomecon merriamii*	On a wide variety of dry to sometimes moist basic soils including alkaline clay and sand, gypsum calcareous alluvial gravels and carbonate rock outcrops.
Meadow Valley sandwort *Arenaria stenomeres*	Carbonate cliffs, ledges, canyon walls and rocky slopes on all aspects above the creosote bush zone.
Eastwood milkweed *Asclepias eastwoodiana*	In open areas on a wide variety of basic (pH usually 8 or higher) soils including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition, frequently in small washes or other moisture-accumulating microsites, in the shadscale, mixed-shrub, sagebrush and lower piñon-juniper zones.
One-leaflet Torrey milkvetch *Astragalus calycosus var. monophyllidius*	Decaying carbonate-derived young soils with sparse vegetation in sagebrush and piñon-juniper communities.
Needle Mountain milkvetch *Astragalus eurylobus*	Generally deep, barren, sandy, gravelly, or clay soils derived from sandstone or siliceous volcanics frequently in or along drainages.
Straw milkvetch *Astragalus lentiginosus var. stramineus*	Deep, loose, sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas with creosote-bursage shrubland in dryer areas and salt cedar-arrowweed communities in wetter washes. Can withstand moderate temporary disturbance. Depends on sand dunes or deep sand.
Halfring milkvetch *Astragalus mojavensis var. hemigyrus*	Carbonate gravels and derivative soils on terraced hills and ledges, open slopes and along washes in the creosote-bursage, blackbrush and mixed shrub zones.
Remote rabbitbrush *Chrysothamanus eremobius*	Crevices or rubble of north-facing carbonate cliffs in and just below the piñon-juniper-sagebrush zone with little leaf mountain mahogany, prickleleaf, three leaf sumac and rock goldenrod.
White River catseye *Cryptantha welshii*	Dry, open, sparsely vegetated outcrops and derived sandy to silty or clay soils of whitish calcareous or carbonate deposits, often forming knolls or gravelly hills, and on soils adjacent to such habitats, mostly in juniper sage rabbitbrush vegetation with various forbs and grasses.

Table 3-9 (continued) Nevada BLM Sensitive Plant Species That May Occur In or Near the Project Area	
Common Name (*Scientific Name*)	**Habitat**
Las Vegas buckwheat *Eriogonum corymbosum* var. *nilesii*	Gypsum soils, often forming low mounds or outcrops in washes and drainages, or in areas of generally low relief often with California bearpoppy and other gypsum-tolerant species, surrounded by creosote-bursage zone.
Clokey buckwheat *Eriogonum heermannii var. clokeyi*	Carbonate outcrops, talus, scree, and gravelly washes and banks in the creosote-bursage, shadscale saltbush and blackbrush zones.
Scarlet buckwheat *Eriogonum phoeniceum*	White tuffaceous knolls, bluffs and rocky flats; openings in piñon and juniper woodland, with big sage, antelope bitterbrush and rock goldenrod.
Sticky buckwheat *Eriogonum viscidulum*	Deep, loose, sandy soils in washes, flats, roadsides, steep aeolian slopes and stabilized dune areas, with creosote-bursage shrubland in dryer areas and salt cedar-arrowweed communities in wetter washes. Can withstand moderate temporary disturbance. Depends on sand dunes or deep sand.
Pioche blazingstar *Mentzelia argillicola*	Dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of pygmy sagebrush, money buckwheat, broom snakeweed and purple sage.
Beaver dam breadroot *Pediomelum castoreum*	Dry, sandy deserts
Beatley scorpion plant *Phacelia beatleyae*	Dry, open, nearly barren scree and loose gravelly soils on slopes and bases of white to brownish volcanic tuff outcrops on all slopes and aspects, and in adjacent drainages, in the mixed-shrub, blackbrush, shadscale saltbush and upper creosote-bursage zones.
Clarke phacelia *Phacelia filiae*	Flat areas or low knolls of valley floors and foothills of desert mountains on light-colored soils including calcareous sandstone, siltstone, tuffaceous claystone and limestone occurring with shadscale saltbush, blackbrush and creosote bush.
Parish phacelia *Phacelia parishii*	Moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted silty-clay soils on valley bottom flats, lake deposits and playa edges, often near seepage areas, sometimes on gypsum deposits, surrounded by saltbush scrub vegetation but with few immediate associates such as shadscale, fourwing and silverscale saltbush, Sandberg bluegrass, Nuttall's povertyweed, Fremont's phacelia, yellow pepperweed and greasewood. Aquatic or wetland dependent.
Schlesser pincushion *Sclerocactus schlesseri*	Open, stable or stabilized, gravelly, sandy silt or silty clay soils derived from somewhat ashy and gypsiferous lacustrine sediments, on mesic microsites created and maintained by gentle north to east aspects, dense shrub and grass canopies, high clay and silt content of the soil and cryptobiotic soil crusts, usually associated with such soil crusts in the shadscale zone with the shadscale saltbush and James' galleta association.
Jones globemallow *Sphaeralcea caespitosa*	Dolomite rock calcareous soil, mixed shrub, piñon-juniper and grass community.
Charleston grounddaisy *Townsendia jonesii var. tumulosa*	Open, sparsely vegetated calcareous areas on shallow gravelly carbonate soils on slopes and exposed knolls in forest clearings mostly in the montane conifer zone with ponderosa pine, extending to the piñon-juniper, mountain mahogany and lower subalpine conifer zones, recurring on knolls of white, alkaline, calcareous, silty lacustrine deposits in the upper shadscale/mixed-shrub and lower sagebrush zones.

BLM – Bureau of Land Management

Surveys for special status plant species were conducted throughout all areas within the proposed ROW and including adjacent areas up to 100 feet from the ROW (ARCADIS 2006a). All surveys were conducted during the appropriate flowering seasons (May and September of 2006) by botanists qualified to: (1) assess potential habitat for these species and (2) identify individuals in their vegetative and flowering forms. These surveys indicated that the project area contained suitable habitat for three sensitive plant species - white bearpoppy, Meadow Valley sandwort and Las Vegas buckwheat. However, no individuals of any these three species were located on or adjacent to the project area during surveys of potentially suitable habitat. Overall, no BLM sensitive plant species, state listed plant species or federally listed Threatened or Endangered plant species were found within proposed or alternate ROWs.

All cactus and yucca species that are native to the State of Nevada are protected and regulated by NRS 527.060-120. The field surveys conducted for this EIS included an inventory of cactus and yucca species occurring within the project area. Cactus and yucca species that occur within the project area include Engelmann's hedgehog cactus (*Echinocereus engelmannii*), California barrel cactus (*Ferocactus cylindraceus* var. *cylindraceus*), common fishhook cactus (*Mammilaria tetrancistra*), beavertail cactus (*Opuntia basilaris*), silver cholla (*Opuntia echinocarpa*), diamond cholla (*O. ramosissima*), Mojave prickly-pear (*Opuntia erinacea*), Joshua tree, and Mojave yucca (ARCADIS 2006a).

3.5 WILDLIFE RESOURCES

The 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 effects on surface waters using the analysis within the Water Resources section of this document. Based on these criteria, 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. The Pahranagat Valley is not included in the ROI as described in Section 3.3.2.2 Surface Water Features and Section 4.3.1.1 Impacts to Surface Water.

3.5.1 Environmental Setting

A wide variety of wildlife resources typical of the Mojave Desert ecological systems are present in the project area. Fish are the only group of vertebrates that are absent from the project area because of the lack of any aquatic environments. The vegetation types or communities that comprise the wildlife habitat in the project area include Mojave Creosote Bush Scrub and Mojave Desert Wash Scrub. Surface water sources potentially available to wildlife include isolated springs, stock ponds and wildlife water developments (water sources created specifically for wildlife). **Appendix E-4** provides a list of common wildlife species expected to occur within the project area. The general types of wildlife that occur within the project area are large mammals, small mammals, bats, reptiles, amphibians and birds.

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 (Hardenbrook 2007).

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).

3.5.2 Federally Threatened, Endangered and Candidate Wildlife Species

As a component of the ESA Section 7 consultation process, a list of Threatened, Endangered, and Candidate species was obtained from the USFWS on May 8, 2006 (Williams 2006). This list is included as **Appendix E-1** of this document. The USFWS identified three federally listed species and one Candidate species that may occur in or near the project area. These four species are the southwestern willow flycatcher (*Empidonax traillii extimus*) and Moapa dace (*Moapa coriacea*) (both are listed as Endangered), desert tortoise (*Gopherus agassizii*) (Mojave population listed as Threatened), and the yellow-billed cuckoo (*Coccyzus americanus*) (Western Distinct Population Segment - listed as a Candidate species). Desert tortoise is the only species among these four that occurs within the project area. The other three species (southwestern willow flycatcher, Moapa dace and yellow-billed cuckoo) may occur within the ROI for wildlife resources. Information characterizing habitat and populations of each of these species is presented below.

3.5.2.1 Desert Tortoise

The desert tortoise was federally listed as Endangered under emergency provisions of the ESA on August 4, 1989 (54 Federal Register 32326). This listing was modified to include only the Mojave population, and the listing changed to Threatened on April 2, 1990 (55 Federal Register 12178). The desert tortoise is classified as Threatened and protected by the State of Nevada under NAC 503.080.

The desert tortoise is most commonly found within the desert scrub vegetation type where creosote bush scrub occurs, but may also be found in association with succulent scrub, cheesebush (*Hymenoclea salsola* A. Gray var. *salsola)* scrub, blackbush scrub, hopsage scrub, shadscale scrub, microphyll woodland, Mojave saltbush-allscale scrub and scrub-steppe vegetation types of the desert and semi-desert grassland complex (USFWS 1994).

Activity patterns of the desert tortoise are closely related to ambient temperatures and forage availability. They spend much of their lives in burrows and emerge in late winter and early spring to feed and mate. This species remains active through the spring and may emerge again after summer storms. While aboveground, the desert tortoise feeds on herbaceous vegetation, which typically consists of grasses and annual flowers (USFWS 1994).

The USFWS designated 6.4 million acres of critical habitat for the Mojave population of the desert tortoise in 1994. Critical habitat is defined in Section 3 of the ESA as "those areas that have biological or physical features that are essential to the conservation of the species." Critical habitat is delineated in areas that meet this criterion. The primary constituent elements that are used by the USFWS to identify critical habitat include:

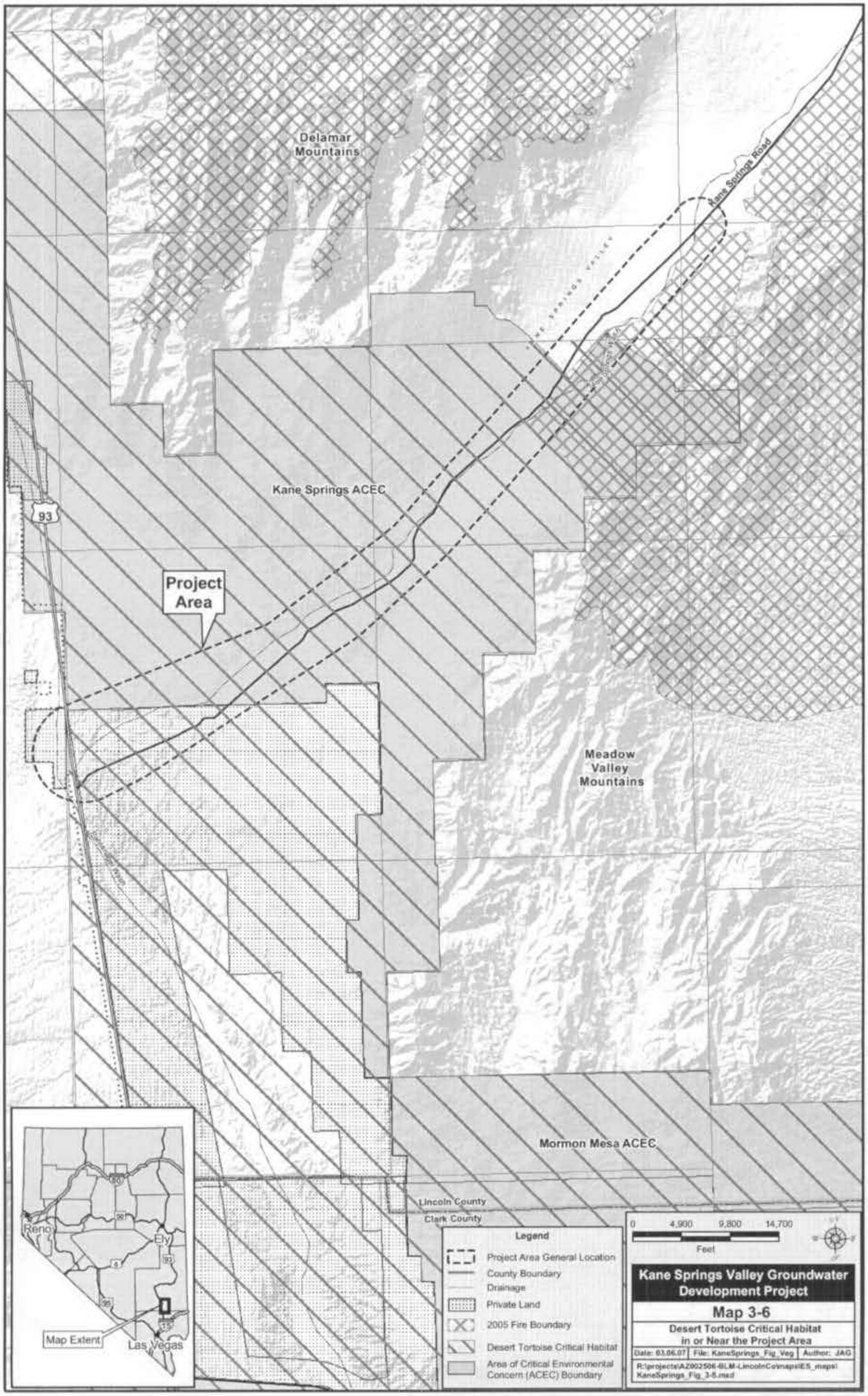
- Space for individual and population growth and for normal behavior;
- Food, water or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction and rearing of offspring; and
- Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (USFWS 1994).

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

- 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 1994).

In Lincoln County, there are 244,900 acres of designated critical habitat for the desert tortoise. The Mormon Mesa Critical Habitat Unit is composed of three Areas of Critical Environmental Concern (ACECs): Kane Springs, Coyote Spring and Mormon Mesa (USFWS 1994). Portions of the Proposed Action and Alternative 1 occur within designated critical habitat for the desert tortoise (Mormon Mesa Critical Habitat Unit) and the Kane Springs ACEC. 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 **Map 3-6**.

A desert tortoise survey was conducted by ARCADIS biologists between October 16 and 18, 2006 in the project area. 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 yards wide and were walked in an equilateral triangle with 0.5 mile to a side. Additionally, transects were spaced at 0.5-mile intervals throughout the project area. Surveys found desert tortoises to be distributed relatively evenly along the proposed ROW. However, nearly all sign were inferred (burrows and water scrapes). Direct signs include five observation of scat. No live or dead tortoises were found during the surveys. Estimated densities of desert tortoise ranged from 0 to 26 per square mile. The highest densities occurred in creosote-bursage communities near Highway 93. No evidence of desert tortoise was observed in burned areas (ARCADIS 2006b).


Delamar Mountains
Kane Springs Road
Kane Springs ACEC
93
Project Area
Meadow Valley Mountains
Mormon Mesa ACEC
Lincoln County
Clark County
Reno
Ely
Map Extent
Las Vegas
Legend
Project Area General Location
County Boundary
Drainage
Private Land
2005 Fire Boundary
Desert Tortoise Critical Habitat
Area of Critical Environmental Concern (ACEC) Boundary
0 4,900 9,800 14,700
Feet
Kane Springs Valley Groundwater Development Project
Map 3-6
Desert Tortoise Critical Habitat in or Near the Project Area
Date: 03.06.07
File: KaneSprings_Fig_Veg
Author: JAG

The Proposed Action would occur within the Northeastern Mojave Recovery Unit. Results of rangewide population monitoring (2001 to 2005) indicate that desert tortoise densities were lowest in this recovery unit during the sample period. Population monitoring data are insufficient at this time to determine population trends by recovery unit (USFWS 2006a).

3.5.2.2 Moapa Dace

The Moapa dace was 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 that 3,841 individuals occurred 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 1995b). A 2005 survey of the area estimated that 1,296 individuals inhabited the 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) (USFWS 2006b). 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 of 86 to 89.6 °F. Breeding habitat for the Moapa dace exists within the ROI in the Muddy River system, but there is no Moapa dace habitat within the project area. Occupied areas of the Muddy River are approximately 28 miles south of the project area.

3.5.2.3 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 9 feet tall with dense foliage from ground level up to approximately 13 feet (USFWS 2002).

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 (USFWS 1995a). 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 (approximately 40 miles southeast of 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; Koronkiewicz et al. 2006). The ROI does not include any critical habitat for the southwestern willow flycatcher.

3.5.2.4 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. Western populations of this species have declined due to loss or degradation of up to 90 percent of its riparian habitat.

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 of suitable habitat. This species breeds in large blocks of riparian habitats, particularly woodlands with cottonwoods, willows and dense understory foliage (USFWS 2001). Breeding habitat for this species is lacking within the project area, but breeding habitat does exist within the ROI in the Muddy River system. 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 (USFWS 2006).

3.5.3 Special Status Wildlife Species

A search of the Nevada Natural Heritage Database and the species lists provided by the NDOW and the BLM indicated that numerous special status wildlife species may occur in or near the project area. Special status species include Nevada BLM sensitive species as well as State of Nevada classified species, including those listed in the Nevada Wildlife Action Plan. These species are listed in **Appendix E-2** and **E-3**. Species' ranges, habitat preferences and known occurrences within Nevada were determined using information obtained from the BLM, the Nevada Natural Heritage Program (2006), Stebbins (2003), Peterson (1990), Fitzgerald et al. (1994), Gullion et al. (1959), NDOW (2005), and regional biologists (Abele pers. comm.2006a, 2006b, 2006c; Morefield pers. comm.2006a and 2006b).

3.5.3.1 Mammals

Nineteen Nevada BLM sensitive mammal species may occur in or near the project area. These include 15 species of bats, one large mammal, and three small mammals. These may occur in or near the project area (see **Appendix E-2** and **E-3**).

While conducting other biological field surveys in the project area, biologists surveyed for caves or mines that could provide habitat for bats, but no such potential habitat occurred within the project area. However, potential day roosts for bats may exist in the form of cracks and crevasses in rock formations near the project area. In 2004, 11 species of bats were identified during surveys conducted in Meadow Valley Wash, Kane Springs Wash and the Meadow Valley Range (Kenney and Tomlinson 2005). The California myotis (*Myotis californicus*), fringed myotis (*Myotis thysanodes*), western pipistrelle (*Pipistrellus hesperus*), 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. Within the Kane Springs Wash, seven bat species were detected using an acoustical bat detector. These species included the pallid bat, Townsend's big-eared bat, long-legged myotis, California myotis, small-footed myotis, fringed myotis and western pipistrelle (Kenney and Tomlinson 2005).

Desert bighorn sheep (*Ovis canadensis nelsoni*) occur in mountain ranges surrounding the project area. These populations are managed by the NDOW as a big game species. Kane Springs Valley is a movement corridor for desert bighorn sheep among the mountain ranges. The Desert NWR west of the project area is managed by the USFWS primarily for maintaining and improving habitat for desert bighorn sheep.

The desert kangaroo rat (*Dipodomys deserti*), desert valley kangaroo mouse (*Microdipodops megacephalus albiventer*), desert pocket mouse (*Chaetodipus penicillatus*), and Merriam's shrew (*Sorex merriami leucogenys*) are the only special status small mammal species that potentially occur in the project area. No location data are available on these species, but their distribution and range overlaps the project area, and suitable habitat is present within the project area.

3.5.3.2 Reptiles and Amphibians

The banded Gila monster (*Helodermus suspectum*) and the chuckwalla (*Sauromalus [ater] obesus*) are the only two Nevada BLM sensitive species of reptiles that may occur in or near the project area (**Appendix E-2**). The ranges of the banded Gila monster and the chuckwalla overlap the Proposed Action, and suitable habitat for these species occurs in the project area. No surveys were conducted to specifically locate either of these two species, but observations were made while conducting surveys for desert tortoise and rare plants. No individuals of either species were identified during these surveys.

Habitat for the banded Gila monster typically consists of boulders, shrubs and trees that, along with mammal burrows and woodrat nests, provide shelter (Stebbins 2003). This species is the largest carnivorous and only venomous, lizard in the United States. Due to its rarity in the wild, the banded Gila monster has become highly prized by some collectors, even though collection of this species is illegal (NDOW 2005). The NDOW reports a sighting of a Gila monster in 1988 at Willow Spring and an additional report on the Kane Springs Road 10 to 12 miles northeast of Highway 93 within the last 5 years (Stevenson pers. comm. 2007). This species is rarely active above ground, and thus it is observed infrequently. Potential habitat for the banded Gila monster occurs in the project area, and this species is assumed to occur within the project area in low densities.

The chuckwalla is a large, flat lizard that typically occurs in areas dominated by rocks, boulders, rocky cliff faces, rocky outcrops, lava flows and rocky hillsides and sometimes flat rocky ground (Stebbins 2003). No specific occurrence data were available for the project area. The range of this species overlaps the project area, and suitable habitat exists within the project area. Therefore, it is assumed that this species occurs in the area.

Other species of special status reptiles that potentially occur in the project area include the western banded gecko (*Coleonyx variegatus*), Great Basin collared lizard (*Crotophytus bicinctores*), desert iguana (*Dipsosaurus dorsalis*), long-nosed leopard lizard (*Gambelia wislizenii*), desert horned lizard (*Phrynosoma platyrhinos*), Sonoran lyre snake (*Trimorphodon biscutatus*), long-tailed brush lizard (*Urosaurus graciosus*), and desert night lizard (*Xantusia vigilis vigilis*) (**Appendix E-3**).

The northern leopard frog (*Rana pipiens*) and the Arizona toad (*Bufo microscaphus*) are the only two Nevada BLM sensitive amphibian species that potentially occur in or near the project area. The northern leopard frog does not occur within the project area, but habitat for this species exists in the ROI in the Muddy River system. The Arizona toad is known from the upper reaches of Meadow Valley Wash and is not expected to occur in the project area or ROI.

3.5.3.3 Migratory Birds

All migratory bird species that may occur in the project area, with the exception of rock pigeons (*Columba livia*), house sparrows (*Passer domesticus*), and European starlings (*Sturnus vulgaris*), are protected under the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703-712). The MBTA states that it is unlawful to take, kill or possess migratory birds, their parts, nests and eggs (16 U.S.C. 703-711). For migratory game species, the treaty order is carried out cooperatively with the state agencies (e.g., NDOW), which set and enforce legal harvest laws and regulations. Any impacts to migratory birds are primarily a concern during the breeding season, when most species protected under the MBTA are expected to occur in the project area.

Some typical nesting species of migratory birds that have the potential to occur in the project area are the cactus wren (*Campylorhynchus brunneicapillus*), horned lark (*Eremophila alpestris*), greater roadrunner (*Geococcyx californianus*), ash-throated flycatcher (*Myiarchus cinerascens*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), loggerhead shrike (*Lanius ludovicianus*), mourning dove (*Zenaida macroura*), and burrowing owl (*Athene cunicularia*). In the more rugged upland and canyon locales, the rock wren (*Salpinctes obsol*) and common raven (*Corvus corax*) can also be considered locally nesting species (Peterson 1990).

Migratory birds occurring within riparian habitats associated with the Muddy River include green heron (*Butorides virescens*), marsh wren (*Cistothorus palustris*), common yellowthroat (*Geothlypis trichas*), blue grosbeak (*Guiraca caerulea*), phainopepla (*Phainopepla nitens*), western tanager (*Piranga ludoviciana*), summer tanager (*Piranga rubra*), vermillion flycatcher (*Pyrocephalus rubinus*), Virginia rail (*Rallus limicola*), and western least bittern (*Ixobrychus exilis*) (Provencher et al. 2005).

Several migratory bird species are considered special status species within the region. The full list of these species is included in **Appendix E-2** and **E-3**. Of these species, the burrowing owl has the highest likelihood of being impacted by the Proposed Action because of its behavior and habitat. Within Nevada, this species occurs in areas dominated by short vegetation where small mammal burrows and desert tortoise burrows are available for nesting. Suitable burrows for this species exist in the project area, and one individual was sighted within the project area during other surveys.

3.5.3.4 Fisheries

There is no habitat for fish in the project area. Within the ROI, the Muddy River supports two Nevada BLM sensitive minnow species: the Virgin River chub (*Gila seminuda*) and Moapa speckled dace (*Rhinichthys osculus moapae*). Introduced species known to occur in the Muddy River include mosquitofish (*Gambusia affinis*), shortfin molly (*Poecilia mexicana*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), red shiner (*Cyprinella lutrensis*), fathead minnow (*Pimephales promelas*), black bullhead (*Ameiurus melas*), golden shiner (*Notemigonus crysoleucas*), rainbow trout (*Oncorhynchus mykiss*), and blue tilapia (*Tilapia aurea*) (USFWS 1995b).

3.5.3.5 Invertebrates

Grated tryonia (*Tryonia clathrata*) and Moapa Warm Spring riffle beetle (*Stenelmis moapa*) are Nevada BLM sensitive species that occur in the Warm Springs area near the Muddy River.

3.6 LAND USE

The ROI evaluated for land use includes the project area and the regional transportation network that would be used during construction and operation of the Proposed Action. Regional transportation routes include Interstate 15 (I-15) and Highway 93. The ROI evaluated for rangeland and livestock grazing includes that portion of the Delamar and Grapevine allotments located adjacent to the Kane Springs Valley Road.

Lincoln County is Nevada's third largest county, encompassing 10,634 square miles (mi^2) in southeastern Nevada. It is bordered by Clark County to the south; Nye County to the west; White Pine County to the north; and to the east by the Utah Counties of Millard, Beaver, Iron and Washington as well as the Arizona County of Mohave. **Map 3-7** shows land status and use in the regional area.

The federal government administers approximately 98 percent of the land in Lincoln County, with the BLM managing approximately 83 percent of total Lincoln County acreage. State lands comprise less than 1 percent of Lincoln County. These lands include the Key Pittman Wildlife Management Area (WMA) near Hiko. Private lands within or adjacent to the project area include those owned by CSI south of the project area and three isolated parcels west of Highway 93. **Table 3-10** lists federal, state, local government and private sector lands in Lincoln County.

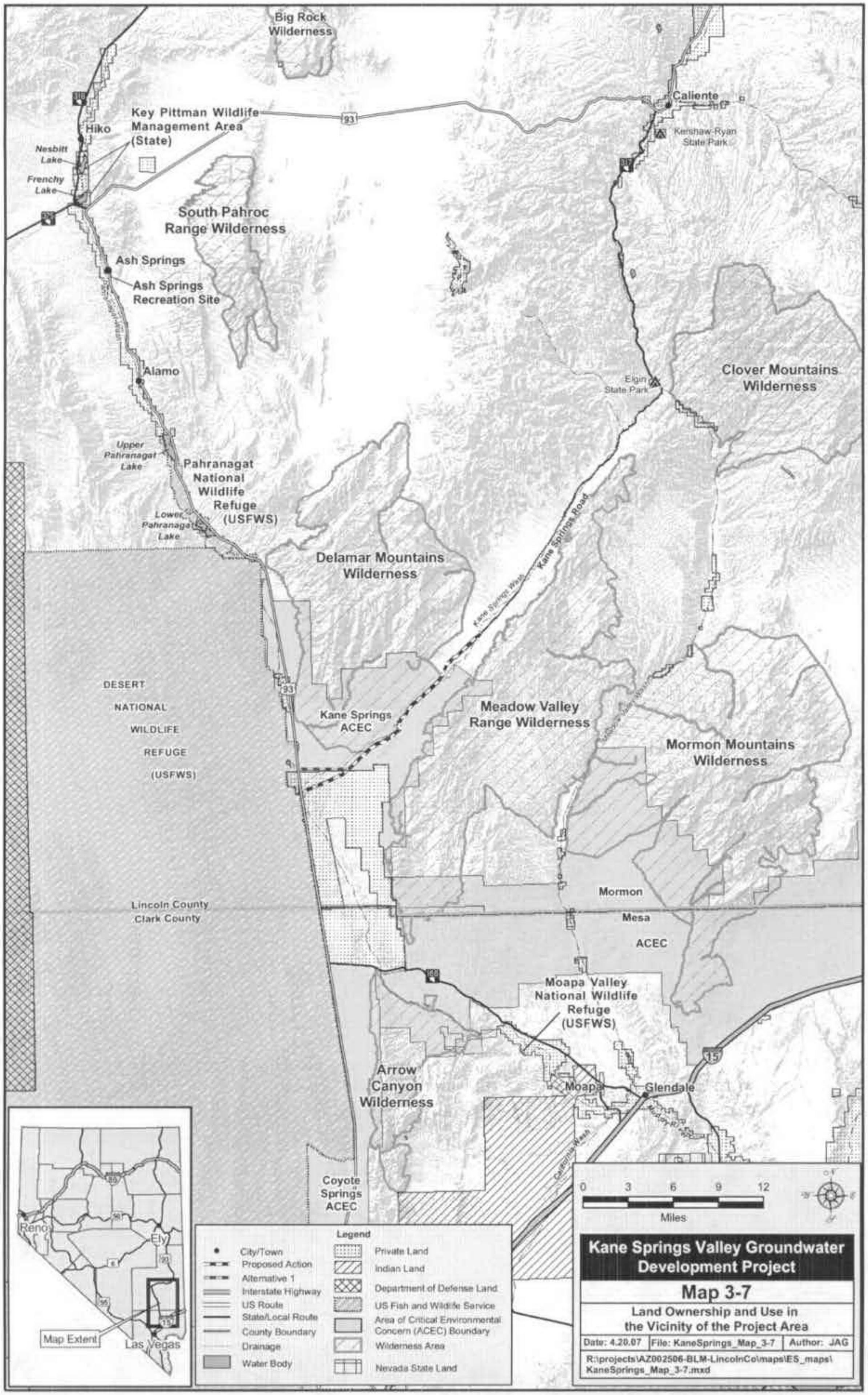

Big Rock Wilderness
Caliente
Kershaw-Ryan State Park
Key Pittman Wildlife Management Area (State)
Hiko
Nesbitt Lake
Frenchy Lake
South Pahroc Range Wilderness
Ash Springs
Ash Springs Recreation Site
Alamo
Elgin State Park
Clover Mountains Wilderness
Upper Pahranagat Lake
Pahranagat National Wildlife Refuge (USFWS)
Lower Pahranagat Lake
Delamar Mountains Wilderness
Kane Springs Wash
Kane Springs Road
DESERT NATIONAL WILDLIFE REFUGE (USFWS)
Kane Springs ACEC
Meadow Valley Range Wilderness
Mormon Mountains Wilderness
Lincoln County
Clark County
Mormon Mesa ACEC
Moapa Valley National Wildlife Refuge (USFWS)
Arrow Canyon Wilderness
Moapa
Glendale
California Wash
Coyote Springs ACEC
Reno
Ely
Las Vegas
Map Extent
Legend
City/Town
Proposed Action
Alternative 1
Interstate Highway
US Route
State/Local Route
County Boundary
Drainage
Water Body
Private Land
Indian Land
Department of Defense Land
US Fish and Wildlife Service
Area of Critical Environmental Concern (ACEC) Boundary
Wilderness Area
Nevada State Land
0 3 6 9 12
Miles
Kane Springs Valley Groundwater Development Project
Map 3-7
Land Ownership and Use in the Vicinity of the Project Area
Date: 4.20.07
File: KaneSprings_Map_3-7
Author: JAG
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Table 3-10 Federal, State, Local Government and Private Lands In Lincoln County		
Categories	**Acres**	**Percentage of Total**
Federal Agencies		
BLM[1]	5,660,396	83.04
U.S. Forest Service	30,703	0.45
USFWS[1]	785,227	11.52
Other Federal Agencies	223,961	3.29
Total Federal Lands	6,700,287	98.29
State Government	18,802	0.28
Local Government and Private Lands	97,509	1.43
TOTAL	**6,816,598**	**100.00**

[1] BLM and USFWS acreages are approximate and do not include pending land exchanges.
BLM – Bureau of Land Management
USFWS – U.S. Fish and Wildlife Service
Source: Zimmerman and Harris 2001; USFWS 2006

Land use on federal lands adjacent to the project area includes livestock grazing, ROWs for utility infrastructure (such as power, telephone/communication lines and roadways), and special designation areas such as ACECs and Wildernesses. A review of the BLM land records database identified the following approved ROWs near the project area:

- NDOT has a material site in T11S, R63E, Section 31.
- Level 3 has a ROW for a buried fiber optic line along the east side of Highway 93.
- The LCPD has a ROW for a power line in T11S, R63E, Sections 20, 21, 29 and 30.
- Idaho Power has a ROW for a transmission line along the east side of Highway 93.
- Lincoln County has a ROW for the old section of Highway 93 that traverses the project area.

The designated LCCRDA utility corridor traverses the project area and is centered primarily along Kane Springs Road. Title III of the LCCRDA established utility corridors for use of electrical, water, gas and other utility transmission across the BLM administered lands.

3.6.1 Rangelands and Livestock Grazing

The project area lies within the BLM Caliente Resource Area. All federal livestock grazing allotments within the project area are classified as perennial allotments. Term permits authorize grazing use based on availability of perennial vegetation. The project area crosses two range allotments: Delamar and Grapevine, both of which are cow/calf operations.

These allotments are administered by the BLM Ely District. Information specific to each of these allotments, including their Animal Unit Months (AUMs), is provided in **Table 3-11**

(Peterson 2006). An AUM is the amount of forage needed to sustain one cow, five sheep, or five goats for a month.

Table 3-11
Grazing Allotments In or Near the Project Area

Allotment Name	Lessee	Preference Level AUMs	Allotment Acres
Delamar	Delamar Valley Cattle Co.	5,558	203,000
Grapevine	Lewis, Robert and Vivian	560	22,000

AUM – Animal Unit Month

Over recent years, stock levels have fluctuated due to forage availability. In addition, actual use may fluctuate based on environmental and economic conditions. The above average precipitation during the winter of 2004-2005 provided for a substantial increase in annual grass production, which resulted in large wildland fires during the summer of 2005. As a result of these fires, numerous allotments were either closed or partially closed to livestock grazing to aid in rangeland restoration. The Grapevine and Delamar allotments are affected by partial closures of the affected areas due to fire.

3.6.2 Mineral Resources

The State of Nevada, Bureau of Mines and Geology has established various "mining districts" within the state. Mining districts in the region include the Delamar Mining District on the northeast side of the Delamar Mountains; Viola Mining District, located east of Elgin in the Clover Mountains; and Gourd Springs Mining District, located east of the Mormon Mountains. Historic commodities associated with these mining districts included gold, silver, copper and perlite. A review of the BLM's database contains no records of active mining claims, mineral leases or mineral ROWs within the project area (BLM 2006c).

Western Elite, Inc. owns and operates a sand and gravel operation on a 560-acre private parcel immediately west of the intersection of Highway 93 and Kane Springs Road. This private parcel was obtained from the federal government on March 12, 1940 under the Pittman Underground Water Act.

3.6.3 Transportation

3.6.3.1 Highways

The primary access to the project area is Kane Springs Road, a county owned and maintained gravel road located east of Highway 93. Vehicular traffic along Kane Springs Road is primarily by local residents and recreational users, including hunters and off-highway vehicle (OHV) users.

Kane Springs Road connects Highway 93 with State Route (SR) 317 at Elgin, a distance of 38 miles. Highway 93 is a major north-south route between Mexico and Canada. I-15 is located approximately 41 miles south of the intersection of Kane Springs Road and Highway 93.

Between Elgin and Caliente, SR 317 parallels the Meadow Valley Wash and the Union Pacific (UP) Railroad. SR 317 experienced extensive road damage from a major flood in 2005. Portions of the road are closed to through traffic at this time.

NDOT operates an automatic traffic recorder (ATR) data site along Highway 93 approximately 12 miles north of the Kane Springs Road at the intersection of Old Corn Creek Road. Historical Annual Average Daily Traffic (AADT) for this site ranges from a low of 1,400 in 1999 to a high of 2,250 in 2000. The last available data in 2005 show an AADT of 1,500. The Level of Service for the portion of Highway 93 between I-15 and Caliente is rated as "A," which indicates a free-flow condition (NDOT 2006).

SR 168 is located approximately 11 miles south of the intersection of Highway 93 and Kane Springs Road in Clark County. SR 168 runs in a southeast-northwest direction, and connects Highway 93 to I-15 through the communities of Moapa and Glendale, a distance of 26 miles.

Numerous gravel and two-track BLM roads parallel and intersect Kane Springs Road between Highway 93 and SR 317. Road system management by the BLM in the Ely District is variable, and priorities for road maintenance are determined on a case-by-case basis. The BLM Ely District has observed an increase in informal travel route proliferation, due mainly to recreation use, which can be correlated to increases in population and OHV use (BLM 2005). OHV activities in the Ely District are managed under the National Management Strategy for Motorized Off-highway Vehicle Use on Public Lands (Executive Orders 11644 and 11989).

The NDOT has conducted a transportation study of southern Nevada including Lincoln County (NDOT 2003). The primary goal of the NDOT study was to inventory existing transportation and socioeconomic trends and to forecast these trends over the next 20 years. According to the study, Highway 93 is considered a major regional roadway and is expected to experience steady growth over the next decade. Overall Daily Vehicle Miles traveled in Lincoln County have increased by 32 percent over the 10-year period (NDOT 2003).

3.6.3.2 Union Pacific Railroad

A UP main line runs through the southern part of Nevada, connecting Los Angeles-Long Beach with Salt Lake City and UP's transcontinental line to the east. A section of the southern UP line parallels the Meadow Valley Wash east of the project area and runs along SR 317 south to Elgin, then further south along Carp Road to Moapa.

3.6.3.3 Airports

There are no airports in the project area. The Lincoln County Airport, located just west of Panaca along Highway 93, accepts small, two-engine airplanes. This airport is more than 75 miles north of the project area. There are several dirt airstrips in Lincoln County; however, most of these are not useable or are rarely used (Dixon 2006). The nearest commercial airport is the McCarran International Airport, which is located in Las Vegas.

Large portions of Lincoln County are located in Military Operations Areas associated with the Nellis Air Force Base. The project area is located in the Desert Military Operations Area, which includes the Elgin and Reveille airspaces. Supersonic aircraft operating from Nellis regularly use the airspace during training operations.

3.7 AREAS OF CRITICAL ENVIRONMENTAL CONCERN, WILDERNESS, AND OTHER SPECIAL USE AREAS

The ROI for ACECs, Wildernesses, and other special use areas includes the portions of the project area immediately adjacent to the Delamar Mountains and Meadow Valley Range Wilderness, and the Kane Springs ACEC.

3.7.1 Areas of Critical Environmental Concern

The BLM regulations (43 CFR part 1610) define an ACEC as an area "within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards." The Caliente MFP (as amended) established three ACECs within the Ely Field District (BLM 1999(. They include the Kane Springs ACEC (65,900 acres), Mormon Mesa ACEC (109,700 acres), and the Beaver Dam Slope ACEC (36,900 acres). These ACECs were designated and managed primarily for the recovery of desert tortoise (BLM 1999). Habitat for the desert tortoise outside of ACECs is also considered in the BLM management decisions with the goal of maintaining or improving existing habitat conditions to stabilize tortoise populations at existing trend levels, improve habitat, and be consistent with recovery efforts by other agencies (BLM 1999).

3.7.2 Wilderness

The Wilderness Act of 1964 created the National Wilderness Preservation System to allow Congress to designate certain public lands as Wilderness "for preservation and protection in their natural condition." Title II of the LCCRDA designated approximately 769,611 acres as Wilderness Area within Lincoln County. Adjacent to the project area, portions of both the Delamar Mountains and Meadow Valley Range were designated as Wildernesses with passage of the LCCRDA (BLM 2006e).

The Delamar Mountains Wilderness encompasses 111,328 acres. The Wilderness is partially located in the Kane Springs ACEC (BLM 2006e).

The Meadow Valley Range Wilderness encompasses 123,488 acres. The Wilderness is partially located in the Kane Springs and Mormon Mesa ACEC. A portion of the Wilderness in Clark County is designed as an "Intensively Managed Area" which is critical to the implementation of the Clark County MSHCP (BLM 2006e).

3.7.3 National Recreation Areas and National Wildlife Refuges

The closest National Recreation Area is Lake Mead, which is more than 50 miles south of the project area.

The Desert NWR Complex is a protected wildlife refuge, administered by the USFWS and located north of Las Vegas, primarily in Lincoln County. The complex includes the Desert

NWR, the Moapa Valley NWR, the Pahranagat NWR, Ash Meadows NWR, and the Amargosa Pupfish Station. Ash Meadows NWR and the Amargosa Pupfish Station are located in Nye County, approximately 90 miles northwest of Las Vegas.

The eastern boundary of the Desert NWR is located immediately west of the project area. The refuge encompasses 1.5 million acres (more than 2,200 mi^2) and includes six major mountain ranges, including the Sheep Range, which forms the western boundary of the Coyote Spring Valley. The refuge is managed by the USFWS primarily for maintaining and improving habitat for desert bighorn sheep. A large portion of the refuge overlaps part of the Nellis Air Force Range. Public Law 99-606, approved November 11, 1986 (100 Stat 3457), provided for the withdrawal of these lands from public use. Military activities on these lands are conducted in accordance with a Memorandum of Agreement (MOA) between the Department of Defense and the USFWS.

The southern reach of the Pahranagat NWR is located approximately 20 miles north of the project area. The refuge is located on 5,380 acres along Highway 93 south of Alamo. The refuge is managed by the USFWS to provide habitat for migratory birds, especially waterfowl. Primary public use consists of wildlife observation, hunting, camping and picnicking.

The Moapa Valley NWR is located northwest of the community of Moapa, south of SR 168. The refuge was established in September 10, 1979 and is managed by the USFWS to secure habitat for the Endangered Moapa dace (USFWS 2006). The refuge is located on 106 acres in northeastern Clark County, approximately 25 miles southeast of the project area.

3.8 RECREATION

The ROI evaluated for effects to recreation resources includes the project area and immediately adjacent areas that may be subject to disturbance from Proposed Action construction.

Most of the recreational use within the area occurs along existing roads that are accessible by passenger vehicle and are within or near designated Wilderness. Existing roadways that provide access into the project area include Highway 93, Kane Springs Road and SR 317.

The mountains and valleys surrounding the project area contain ecologically diverse habitats that offer a range of recreational opportunities. The Meadow Valley Range and Delamar Mountains Wildernesses offer an abundance of dispersed recreational activities such as camping, hiking, climbing, hunting and wildlife viewing. OHV use is limited to existing roads, trails and dry washes.

OHV race events periodically occur on Kane Springs Road. Management of OHV use on BLM designated public lands, is guided by the National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands (Executive Orders 11644 [1972] and 11989 [1978], and regulation 43 CFR 8340). Race activities in the ROI are managed under 43 CFR 8372 and guided by decisions in the Caliente MFP amendment. OHV race events on the BLM lands require a Special Recreation Permit from the BLM management office (BLM 2005).

3.8.1 BLM-Designated Recreation Areas

On BLM lands, recreational sites are classified as developed, primitive or dispersed. Developed recreational facilities are those that provide permanent facilities (such as picnic tables and pit toilets), are easily accessible, and are designed to accommodate uses such as camping or picnicking. Primitive and dispersed recreational sites do not have facilities. There are no developed recreational facilities in the project area.

The BLM-designated recreation areas include the BLM-designated OHV areas and designated recreation areas such as scenic areas, rock hounding areas, natural areas, natural research areas and historic trails. The nearest BLM-designated recreation area is Ash Springs Recreation Site, located approximately 7 miles north of Alamo in the small community of Ash Springs. The developed facility includes a natural hot spring, picnic tables and a vault toilet.

3.8.2 State Parks and Recreation Areas

The nearest state park is the newly designated Elgin Schoolhouse Museum in Elgin, approximately 20 miles northeast of the project area. The restored one-room schoolhouse became Nevada's newest state park in October 2006. Approximately 18 miles north of the Elgin Schoolhouse Museum is Kershaw Ryan State Park. The park, located 2 miles south of Caliente, can be reached from the south via SR 317 and Kane Springs Road and from the north from Highway 93 south on SR 317. Recreational opportunities include picnicking, hiking trails, photography and nature study (Nevada Division of State Parks 2006).

3.8.3 State Wildlife Management Areas

There are no state WMAs in or near the project area. The closest WMA to the project area is the Key Pittman WMA, which is located approximately 10 miles north of Alamo, off of SR 318 in the Pahranagat Valley. It includes two small lakes: Nesbitt Lake on the north and Frenchy Lake on the south.

3.9 AIR QUALITY

The ROI evaluated for direct effects to air quality includes the project area and immediately adjacent areas that may be subject to disturbance from Proposed Action construction. Indirect effects are evaluated for air quality in the region as a result of the implementation of the Proposed Action or alternatives.

3.9.1 Existing Air Quality

All of Lincoln County is in full attainment of ambient air quality standards; that is, existing background concentrations for all criteria air pollutants are lower than the maximum allowable ambient concentrations under Nevada and national ambient air quality standards. These criteria pollutants include ozone, carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), particulate matter with mean aerometric diameter smaller than 10 microns (PM_{10}), particulate matter with mean aerometric diameter smaller than 2.5 microns ($PM_{2.5}$), and lead. Units of concentration are expressed in parts per million or micrograms per cubic meter (ug/m^3).

The air quality monitoring station closest to the project area is located at the intersection of Highway 93 and I-15 in Clark County (EPA Site 320030022). **Table 3-12** presents PM_{10} concentrations collected at the intersection of Highway 93 and I-15 (Apex) for the years 2002 through 2005. This location is approximately 45 miles south of the project area. The data show that 24-hour concentrations have exceeded the standard several times during this period. Although the Apex area is more industrial than the project area, these readings suggest that the high 24-hour value is related to natural events. For the Las Vegas area, the Clark County Department of Air Quality Management (CCDAQM) has identified high wind events as being "largely responsible for exceedances of the 24-hour PM_{10} air quality standard" (CCDAQM 2002). It is likely that these events are also common in the project area.

3.9.2 Areas with Special Air Quality Protection

There are no special air quality protection areas within or near the project area. The closest designated federal Class I air quality area is the Grand Canyon National Park in Arizona, which is more than 100 miles east of the project area. The Lake Mead National Recreation Area is a designated federal Class II air quality area. The northern boundary of the recreational area is more than 50 miles from the project area.

Table 3-12
Intersection of Hwy 93 and I-15 (Apex) PM_{10} Concentrations 2002 - 2005

Year	24-Hour PM_{10} (ug/m³)			Annual PM_{10} (ug/m³)
	Maximum	Day Maximum Recorded	Second Highest	
2002	465	04/15/02	176	26.4
2003	348	10/30/03	105	23.8
2004	150	05/10/04	85	19.1
2005	97	05/16/05	72	18.9

Source: EPA 2006
PM_{10} - particulate matter with mean aerometric diameter smaller than 10 microns
ug/m^3 – micrograms per cubic meter

3.9.3 Existing Stationary Sources of Air Emissions

There are no stationary sources in Lincoln County that emit any criteria pollutant at concentrations higher than 100 ton/yr (major sources). The proposed Toquop Power Plant Project, which would be located southeast of the project area, is currently being reviewed for a major source Prevention of Significant Deterioration air quality construction permit, but this project has not yet been constructed.

3.9.4 Air Quality Regulations

Controlling fugitive dust from construction activities is covered in the NAC 445B.22037 - Emissions of particulate matter: Fugitive dust. A Class II Air Quality Operating Permit for Stand-Alone SAD Permit and a dust control plan are required for surface disturbances of more than 5 acres. The plan must consider "best practical methods" to prevent particulate matter from becoming airborne that include, but are not limited to, paving, chemical stabilization, watering, phased construction and revegetation. The LCWD has prepared a Dust Control Plan as part of its POD submitted to the BLM.

3.10 NOISE

The ROI evaluated for noise includes the project area and those areas immediately adjacent to the project area that may be subject to disturbance from Proposed Action construction and operation.

Sound levels are affected by numerous factors. These factors include a site's general setting (such as isolated, rural, suburban or urban); nature of the noise sources or activities occurring in those settings; proximity of the receptor to the noise source or activity; time of day; and various attenuating factors such as vegetation, topographic features, buildings and atmospheric conditions, that can mute or interrupt noise waves.

Noise standards and sound measurement equipment have been designed to account for the sensitivity of human hearing to different frequencies. This is accomplished by applying "A-Weighted" correction factors. This correction de-emphasizes the very low and very high frequencies of sound in a manner similar to the response of the human ear. The primary assumption is that the A-weighted decibel (dBA) is a good correlation to a human's subjective reaction to noise.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The dBA scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3 dBA is barely perceptible to average human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling or halving of loudness, while a 20 dBA change is considered a dramatic change in loudness. **Table 3-13** shows noise levels associated with common everyday sources and places the magnitude of noise levels discussed here in context.

Table 3-13
Common Noise Sources and Levels

Noise Source	Average Noise (dBA)
Ambulance siren (100 feet)	100
Typical construction site	85
Single truck (25 feet)	80
Single car (25 feet)	65
Within 100 feet of a highway	60
Normal conversation (5 feet apart)	60
Residential area during day	50
Residential area at night	40
Rural area during day	40
Rural area at night	35
Quiet whisper	30
Threshold of hearing	20

dBA – A-weighted decibel

The project area is a rural, uninhabited area. Average noise levels in rural areas are typically in the 35 to 40 dBA range. Ambient noise in rural areas is commonly made up of natural sounds and vehicle and aircraft traffic. Except for vehicle traffic on rural roads, aircraft and natural sounds, there are few noise-generating sources in the area. The airspace over the project area includes Military Operations Areas associated with the Nellis Air Force Base. Military air traffic generates two types of noise:

- Subsonic flight noise as generated by an aircraft's engines and airframe and
- Sonic booms generated by supersonic flights.

The level of military aircraft sound that is perceived at ground level will depend on the altitude of the aircraft and meteorological conditions. For subsonic flights, the estimated baseline ground level Onset Rate Adjusted Monthly Day-Night Average Sound Levels (L_{dnmr}) for the Elgin and Reveille airspaces to be 47 and 56 dB, respectively (USAF 1999). These values are based on 300,000 sortie-operations. The project area is located in the Desert Military Operations Area which includes the Elgin airspace. The L_{dnmr} metric is based on the rapid ambient sound increase (onset rate) related to aircraft operations. This same study estimated that ground level C-Weighted Day-Night Sound Level from sonic booms would be 56 dB for the Elgin airspace (30 booms per month) and less than 45 dB for the Reveille airspace (two booms per month).

The project area is subject to the management guidance included in the Caliente MFP (as amended). The Caliente MFP does not contain noise regulations or standards (BLM 1999). Further, Lincoln County currently does not have noise regulations or standards.

3.11 VISUAL RESOURCES

The ROI for visual resources includes areas visible from off-site viewpoints and the viewsheds of the Proposed Action alternatives. The ROI consists of viewsheds from which Proposed Action components would be seen; primarily from higher elevations and public roadways. The ROI is limited in spatial extent to the Kane Springs Valley and portions of the Coyote Spring Valley because the portion of the LCCRDA corridor that would contain Proposed Action facilities is surrounded by mountain ranges that block views of the LCCRDA corridor from sensitive viewing areas located outside of the LCCRDA corridor.

For lands managed by the BLM, Visual Resource Management (VRM) objectives have been developed to protect the most scenic public lands, especially those lands viewed most by the public. The VRM system is the basic tool used by the BLM to inventory and manage visual resources on public lands. VRM classes are objectives that outline the amount of disturbance an area can tolerate before it no longer meets the visual quality of that class. VRM classifications range from Class I, the most restrictive, to Class IV, the least restrictive.

- ***Class I Objective:*** To preserve the existing character of the landscape. The level of change to the characteristic landscape should be low and must not attract attention.
- ***Class II Objective:*** To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.

- ***Class III Objective:*** To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- ***Class IV Objective:*** To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

3.11.1 Environmental Setting

The topography of southeast Lincoln County is characterized by high mountain ranges with intervening valleys and canyons featuring broad alluvial fans and bajadas. The project area is located along the Kane Springs Valley and Coyote Spring Valley floors that lie between the Delamar Mountain Range on the north, the Meadow Valley Mountain Range on the south, and the Clover Mountains to the northeast. The mountain ranges rise above the valley and provide a scenic backdrop as viewed from Highway 93 and Kane Springs Road. A typical view of the landscape within the project area is shown on the cover of this EIS.

Evidence of cultural modification in and near the project area includes roads (Highway 93, Kane Springs Road and remnants of old Highway 93), an overhead transmission line and a recently buried fiber optic line along Highway 93, and the Bedrock Limited, LLC facilities west of the intersection of Kane Springs Road and Highway 93.

VRM classes in the vicinity of the project area are aimed at protecting visual resources on public lands in close proximity to the two Wildernesses. Under the BLM management in the current Caliente MFP, the LCCRDA corridor is located on lands managed under VRM Class III. The objective of VRM Class III is to provide for management activities that may contrast with the basic landscape elements but remain subordinate to the existing landscape character. Activities may be visually evident, but should not dominate. The nearby Delamar Mountains Wilderness and Meadow Valley Range Wilderness are managed under VRM Class I objectives.

With the creation of the utility corridor in the LCCRDA of 2004 Section 301, the current VRM (Class III) will change to VRM Class IV to fulfill the requirements of the act " ...the Lincoln County Water District nonexclusive rights-of-way to Federal land in Lincoln County and Clark County, Nevada, for any roads, wells, well fields, pipes, pipelines, pump stations, storage facilities, or other facilities and systems that are necessary for the construction and operation of a water conveyance system..." (Winslow 2007).

3.11.2 Key Observation Points

Key Observation Points (KOPs) are critical viewpoints on a travel route, at a use area or potential use area, or in communities where the view of a management activity would be most revealing. KOPs are normally evaluated for proposed actions located in scenic landscapes or where people would be concerned about visual quality of the landscape. KOPs are often selected based on angle of observation, number of viewers, length of time the Proposed Action is in view, relative size of the Proposed Action, season of use and lighting conditions of the area. Some KOPs are located outside of project areas for assessment as an off-site viewpoint of the viewshed. In consultation with the BLM staff, one KOP located along Highway 93 near the junction of Kane Springs Road was selected to analyze typical visual impacts that would be experienced by motorists traveling along this route. In general, views from the road would be from moving vehicles.

The KOP provides typical views of the project area landscape to the east as seen by motorists on Highway 93. The landscape east of the Highway 93 consists of rugged terrain in the immediate foreground distance zone (up to 0.5 mile from the viewpoint) that blocks views of the project area; however, the KOP location represents views towards the project area that would be seen by the largest number of people who would have concerns for changes in the existing landscape.

The current landscape that is viewed from the KOP does not contain any significant scenic vistas, features or landforms, and is common to the area; however, the natural setting is an important aspect of the mountainous terrain scattered throughout southern Lincoln County.

In addition to the KOP, views of the project area landscape in the foreground distance zone are available from Kane Springs Road, which provides access to recreational opportunities on BLM lands as well as scenic vistas of both the Meadow Valley Range and Delamar Mountains to travelers on the road. The quality of the visual resource is an important part of the recreational experience for many visitors to public lands and Wilderness areas. The number of viewers is low relative to Highway 93, but the level of concern for individuals traveling the Kane Springs Road for recreational pursuits would be high.

3.12 SOCIOECONOMICS

The ROI for the socioeconomic analysis is Lincoln and Clark Counties, as social and economic effects occur for community and county jurisdictions rather than resource-based areas of influence. The counties are located in the southeast corner of Nevada. Population and labor data are provided for communities located closest to the project area. The nearby Towns of Alamo and Caliente in Lincoln County and Las Vegas in Clark County would provide workers and lodging for the Proposed Action workforce. Demographic data for Nevada are included to set the Proposed Action in a regional context.

3.12.1 Social Characteristics

Most of Nevada's population is located in Clark County (68.8 percent). In 2000, the population of Clark County was 1,375,765, while the population of the State of Nevada was 1,998,257. By 2005, Clark County's estimated population was 1,710,551, a 24.3 percent increase from the year 2000. Of this total, 96 percent live within the urban Las Vegas metropolitan area.

In contrast, Lincoln County's population in 2000 was 4,165, which was less than 0.2 percent of Nevada's population. In 2005, the estimated population of Lincoln County was projected at 4,391, an increase of 5.4 percent. The county's population tends to be concentrated in one incorporated city, Caliente (1,015), and three unincorporated towns: Pioche (698), Panaca (562), and Alamo (428). Together, these four communities account for 61 percent of Lincoln County's estimated 2005 population. The remaining population is settled on isolated private residential areas throughout the county, most immediately located near the aforementioned four communities (Nevada State Demographer's Office 2006a).

As shown in **Table 3-14**, population growth rates in Lincoln County and the communities of Caliente and Alamo were considerably lower than the growth rates for the State of Nevada and for communities in Clark County. North Las Vegas is one of the fastest growing large cities in the nation. The City of Mesquite has also seen high growth rates. In contrast, the economies of Lincoln County have historically been tied to mining and agriculture, and slow population growth rates have reflected the declines of these economic sectors.

The University of Nevada's Center for Economic Development prepared the Analysis of Socio-Economic Data and Trends for Lincoln County to be used for background material for a Comprehensive Economic Development Strategy (CEDS) in Lincoln County and the strategic plan for tourism in Lincoln County (UNR 2004). According to the analysis, Lincoln County's historic dependency on the mining sector and activities at the Nevada Test Site have resulted in unstable population growth rates between 1970 and 2002, indicating the need for economic diversification in the county. The slow growth rate of the county population between 2000 and 2005 (5.43 percent) relative to the growth rate of 52.95 percent in North Las Vegas for the same period is attributed to declines in mining or test site activities. The report further indicates that mining activity accounted for much of the population and economic growth in the 1970s, but declined with the closing of operations at the Bunker Hill Mine and a reduction of the workforce at the Tempiute Mine. Economic and population growth from the 1980s through 2005 resulted from an increase in government and service sector jobs. In addition to reductions in mining, the reduction in agriculture employment is consistent with national trends which reflect fewer small family farms and more mechanization.

Table 3-14
Population Trends in the State of Nevada, Clark County and Lincoln County

Geographic Area	Population (2000)	Population (Estimated 2005)	Percent Change
State of Nevada	1,998,257	2,414,807	20.85%
Clark County	1,375,765	1,710,551	24.33%
Las Vegas	478,434	545,147	13.94%
North Las Vegas	115,488	176,635	52.95%
Mesquite	9,389	13,523	44.03%
Lincoln County	4,165	4,391	5.43%
Caliente	1,123	1,148	2.23%
Alamo	478	428	-10.46%

Source: Nevada State Demographer's Office 2006a

The Nevada State Demographer's population projections estimate that the population of Nevada will have increased by nearly 79 percent between 2005 and 2025. The highest rates of growth are anticipated to occur between 2005 and 2010, as shown in **Table 3-15**. The annual growth rate would be an estimated 4.6 percent between 2005 and 2006, and would decrease annually at a steady rate to 1.3 percent between 2025 and 2026. Lincoln County is projected to have one of the highest growth rates of all Nevada counties between 2005 and 2026, ranking third behind Clark and Lyon Counties. County growth rates are similar to state projections, but are anticipated to decline faster than state rates in that the highest annual growth rate of 4.7 percent would occur between 2005 and 2006, and would decrease to 0.3 percent between 2025 and 2026.

Table 3-15
Population Projections for State of Nevada, Clark County and Lincoln County

Year	Nevada		Clark County		Lincoln County	
	Projected Population	Percent Change	Projected Population	Percent Change	Projected Population	Percent Change
2005[1]	2,518,869	N/A	1,796,380	N/A	3,886	N/A
2010	3,087,428	22.57	2,281,997	27.03	4,754	22.34
2015	3,605,713	16.79	2,718,502	19.13	5,330	12.12
2020	4,001,520	10.98	3,045,813	12.04	5,694	6.83
2025	4,315,334	7.84	3,299,623	8.33	5,875	3.18

[1] The 2005 population is derived from Census 2000 projections, and is not the same as the 2005 estimate provided by the U.S. Census.
N/A – Not Available
Source: Nevada State Demographer's Office 2006b and 2007

The population projections are estimated from historic population trends and do not take into account future probable and foreseeable developments and events. It is likely that actual population growth in Lincoln County would be considerably greater than the population projections shown in **Table 3-15**. Substantial population growth would result from the development of the CSI planned community over the next two to three decades. Other events that could influence population trends are the development of the Lincoln County Land Act (LCLA) parcel north of Mesquite in the southeast corner of Lincoln County.

In 2000, the median age of Lincoln County residents was 38.8 years, which was higher than the 2000 median age of 35.0 in Nevada as a whole and the median age of 34.4 in Clark County. Lincoln County median age increased in 2000 from the 1990 median age of 33.4 years and the 1980 median age of 27.8. These shifts to an increased median age in the county indicate a decrease in the proportionate share of younger age groups. The decrease in the proportionate share of younger age groups in Lincoln County is similar to that of most rural counties in the United States.

According to an economic development strategy analysis prepared by the University of Nevada, rural counties often lose population in age groups 20 to 24 years and 25 to 34 years of age because the young people with the best education, health and the most marketable skills and abilities leave the rural areas to realize greater economic opportunities. In addition to the out-migration of young persons, increased rates of retiree in-migration in recent years has raised concerns that the growing elderly population would require greater levels of public services in a narrowing economy characterized by a shrinking revenue base.

At least part of the reason for Lincoln County's sparse population is that 98 percent of the county's land area is administered by the federal government, and only 1.43 percent is owned by local government or private interests. The two counties can be further compared through a review of the social characteristics of their respective populations in 2000.

Table 3-16 shows population by race in Lincoln County compared with the State of Nevada.

Table 3-16
Population of Race in Lincoln County and Nevada

	Lincoln County	Nevada
White persons, 2004 (a)	95.3%	82.5%
Black persons, 2004 (a)	2.0%	7.5%
American Indian and Alaska Native persons, 2004 (a)	1.9%	1.4%
Asian persons, 2004 (a)	0.4%	5.5%
Native Hawaiians and Other Pacific Islanders, 2004 (a)	0.0%	0.5%
Persons reporting two or more races, 2004	0.3%	2.5%
Persons of Hispanic or Latino origin, 2004 (b)	6.2%	22.8%
White persons, not Hispanic, 2004	89.6%	61.2%

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.
Source: Source U.S. Census Bureau 2000

In terms of educational attainment, 83 percent of Lincoln County's population 25 years and older had graduated from high school or higher, and 15.1 percent had attained a bachelor's degree or higher. For Clark County, 79.5 percent of the population 25 years and older had graduated from high school or higher, and 17.3 had attained a bachelor's degree or higher.

Lincoln County's population was made up of 19.6 percent civilian veterans, and Clark County's population had 15.6 percent.

The disability status of the population was 21.1 percent and 24.6 percent for Clark and Lincoln Counties, respectively.

Eighteen percent of the Clark County population was foreign-born compared to 3.5 percent in Lincoln County.

Married males made up 52.6 percent of the population older than 15 years in Clark County and 65.7 percent in Lincoln County. Married females older than 15 years made up 52.2 percent of the population in Clark County and 59.4 percent in Lincoln County.

The percent of the population that speaks a language other than English at home was 26 percent in Clark County and 6.1 percent in Lincoln County.

Households with persons 65 years or older totaled 31.9 percent for Lincoln County compared to 21.3 percent in Clark County and 23.4 percent for Nevada (U.S. Census Bureau 2000).

3.12.2 Economic Characteristics

The economy of Lincoln County has historically been supported by mining, agriculture, railroad operations, and federal defense research and development activities. Mining and agriculture have been the dominant economic activities in Lincoln County and continue as a source of income; however, the relative importance of agriculture and mining has decreased in recent decades. Both sectors are still important in the local economy, but constituted a smaller share of employment and personal income sources. The historic economy has also been characterized by the "bust and boom" cycles of a mining economy, as shown by periods of high population growth, no population growth and population declines.

During the late 1970s and early 1980s, mining accounted for approximately 24 percent of the employment and 32 percent of the personal income in Lincoln County. **Table 3-17** summarizes the labor force characteristics of Lincoln and Clark Counties. The table includes data for the State of Nevada to provide a regional context for the county labor force data. Unemployment rates in 2005 have steadily declined from the rates shown for 1990 in **Table 3-17** for Nevada and both counties. The table shows a disproportionately high rate of 7.2 percent for Lincoln County in 1990, which occurred because the county economy had not recovered from the reductions in the mining sector.

While agriculture and mining activity have decreased in Lincoln County, these are still important basic industries, in that they bring money into the county economy through sales to non-local businesses and individuals. The county's agricultural industry produced total cash receipts of $48.5 million in 2003 (most recent available data). Typically, the manufacturing sector is also a fundamental basic industry, as the sector generally provides significant employment and income for the local economy. However, there is currently no manufacturing sector in Lincoln County.

Table 3-17
Labor Force Characteristics of the State of Nevada, Clark County and Lincoln County 2000 through 2005

	Nevada			Clark County			Lincoln County		
Year	**1990**	**2000**	**2005**	**1990**	**2000**	**2005**	**1990**	**2000**	**2005**
Labor Force	655,895	1,062,845	1,215,957	407,763	727,521	862,678	1,464	1,655	1,552
Employment	622,516	1,015,221	1,166,624	387,881	693,933	828,245	1,359	1,573	1,473
Unemployment	33,380	47,624	49,333	19,882	33,588	34,433	105	82	79
Unemployment Rate	5.1	4.5	4.1	4.9	4.6	4	7.2	5	5.1

Source: Nevada Department of Employment, Training, and Rehabilitation 2006a

Table 3-18 summarizes the number of people employed by all economic sectors in the State of Nevada and Clark and Lincoln Counties in 2005. Clark County's economy is largely service-based, with 865,987 persons employed in private and government sectors. Federal, state, and local governments employed more than 47 percent of the total employed labor force in Lincoln County, which is a strong contrast with total government employment in Clark County (10.0 percent) and Nevada (11.6 percent). This indicates the strong dependence of the local economy on government agencies.

Government jobs at the local level in Lincoln County include those in the City of Caliente, Lincoln County government agencies, the Lincoln County School District, various county General/Special Improvement Districts and the Grover C. Dils Medical Center. State government workers are employed at the Nevada Division of Forestry's honor camp in Pioche, the Caliente Youth Training Center, the Nevada Division of Parks or the NDOT, among others. Federal agencies operating in or near Lincoln County include the U.S. Department of Energy, U.S. Department of Defense and the BLM.

Table 3-18
Employment by Industry: State of Nevada, Lincoln County and Clark County in 2005

Industry	Nevada		Lincoln County		Clark County	
	Average Employment	Percent of All Industries	Average Employment	Percent of All Industries	Average Employment	Percent of All Industries
Total, All Industries	1,215,739	100.0%	1,268	100.0%	865,987	100.0%
Total Private	1,075,042	88.4%	670	52.8%	779,689	90.0%
Agriculture	2,162	0.2%	26	2.1%	157	0.0%
Mining	10,561	0.9%	20	1.6%	378	0.0%
Utilities	5,046	0.4%	0	0.0%	3,280	0.4%
Construction	134,997	11.1%	17	1.3%	101,550	11.7%
Manufacturing	47,810	3.9%	0	0.0%	24920	2.9%
Wholesale Trade	37,411	3.1%	205	16.2%	22,157	2.6%
Retail Trade	131,913	10.9%	189	14.9%	94156	10.9%
Transportation and Warehousing	40,403	3.3%	6	0.5%	28693	3.3%
Information	14,672	1.2%	23	1.8%	10,420	1.2%
Finance and Insurance	40,182	3.3%	99	7.8%	30,048	3.5%
Real Estate and Rental and Leasing	25,038	2.1%	0	0.0%	19,375	2.2%
Prof. and Technical Services	48,291	4.0%	0	0.0%	33,582	3.9%
Company and Enterprise Mgmt.	11,881	1.0%	0	0.0%	8,589	1.0%
Administrative and Waste Services	85,449	7.0%	17	1.3%	62,833	7.3%
Educational Services	5,894	0.5%	20	1.6%	4,308	0.5%
Health Care and Social Assistance	78,328	6.4%	20	1.6%	53,230	6.1%
Arts, Entertainment, Recreation	29,190	2.4%	90	7.1%	18,135	2.1%
Accommodation and Food Services	298,321	24.5%	82	6.5%	244,525	28.2%
Other Services, Ex. Public Admin	26,506	2.2%	0	0.0%	18,725	2.2%
Unknown Industry	986	0.1%	0	0.0%	631	0.1%
Federal Government	16,785	1.4%	41	3.2%	11,045	1.3%
State Government	31,348	2.6%	134	10.6%	14,208	1.6%
Local Government	92,564	7.6%	424	33.4%	61,045	7.0%

Source: Nevada Department of Employment, Training, and Rehabilitation 2006b

Many sub-sectors of the service economy in Lincoln County are proportionately small when compared with the service sub-sectors in the state and Clark County economies, particularly accommodation and food services, real estate, professional and technical, and health care services. In contrast, employment numbers in the retail trade sectors and the arts, entertainment and recreation services sub-sector indicate that tourism and recreation play a key role in the Lincoln County economy.

Lincoln County employment in the construction sector accounted for less than 2 percent of total county employment, which contrasts with construction employment of more than 11 percent in

Clark County and the State of Nevada in 2005. Construction services are generally purchased primarily by local businesses and individuals. The low level of construction activities in Lincoln County relative to the nearby Clark County indicates that the Clark County economy continues to grow while economic growth in Lincoln County is slow.

In 2004, total personal income for Lincoln County was $93 million and for Clark County was $54.3 billion. The total personal income for the State of Nevada was $79.5 billion. Dividends, interest, rents and transfer payments in Lincoln County account for a larger percentage of total personal income than in the state or Clark County, which indicates a larger retiree population in Lincoln County.

3.12.3 Housing

The total estimated number of housing units in Lincoln County in 2005 was 2,231 units, an increase of 2.3 percent from the estimated 2,180 housing units in 2000. The growth rate in Lincoln County was small relative to the growth in housing stock in neighboring Clark County. The number of housing units in Clark County increased by 26.9 percent from 566,107 units in 2000 to 718,358 units in 2005. The slow growth in Lincoln County housing units between 2000 and 2005 indicates that, despite the relatively close proximity of much of Lincoln County to Las Vegas and its surrounding metropolitan communities, there has been very little overflow of the Las Vegas population growth into Lincoln County. The housing stock in Lincoln County and communities within the county was one of the factors contributing to potential economic development analyzed in the 1998 Lincoln County Overall Economic Development Plan (OEDP). The narrowness of the economic base in Lincoln County is exacerbated by the lack of housing, which is one of the primary reasons identified by potential employers as a disincentive to relocate to Lincoln County (Board of Lincoln County Commissioners 1998).

There are no recent data on the availability of rental housing in Lincoln County. However, anecdotal reports indicate that vacant housing of any kind is scarce. In response to the scarce housing stock, Lincoln County has asked the BLM to process the sale of 638 acres near the Town of Alamo for the development of residential uses (Baughman 2006a).

Temporary housing in Lincoln and Clark Counties includes hotels and recreational vehicle (RV) parks in addition to rental housing. Las Vegas and the surrounding metropolitan communities provide numerous motels, hotels and RV parks within about a 1-hour commute of the project area. Alamo, the Lincoln County community nearest to the project area, provides lodging of an estimated 40 to 50 rooms in two motels and many unoccupied hookups in three RV parks (Lincoln County Chamber of Commerce 2006, Baughman 2006b). A new 42-unit subdivision may also provide rentals for temporary housing (Baughman 2006b).

3.12.4 County Services

Lincoln County is largely rural in the southern half of the county with most county services located near the population centers of Alamo, Pioche and Caliente. In Clark County, many of the available county services are located in the greater Las Vegas area and, to a smaller extent, in outlying communities.

Lincoln County services and utilities are provided by a variety of general- and special-purpose districts and private corporations, which provide services such as water, sewer and fire protection at the local level. The districts act independently of county and town boards. The CSI development area has formed a GID that will provide these public services to developments within their planning area.

Fire protection and emergency medical services will be provided for the planning area by the Coyote Spring – Lincoln County Fire Protection and Emergency Medical Service GID. Funds to support the GID would be provided through a property tax levy on private property within the proposed CSI development.

The Lincoln County Office of Emergency Management is responsible for coordinating emergency response for the entire county. In the project area, fire protection services are provided by the Pahranagat Valley Volunteer Fire Protection District (PVVFPD). The PVVFPD encompasses nearly 36 mi^2 in southwest Lincoln County; however, because fire protection services for rural areas of the county are limited, service calls have been made beyond the PVVFPD boundaries for the entire western half of Lincoln County. The Pahranagat Valley Ambulance Association is a unit of the PVVFPD and also provides service to the western half of the county. Law enforcement is provided by the Lincoln County Sheriff's Department (Lincoln County Planning Commission 2006).

Clark County is one of the fastest-growing counties in the nation. With the influx of large populations, the cost of living, including the cost of housing, has skyrocketed in recent years. Clark County offers a program known as "workforce housing." Workforce housing is for low- to moderate-income households that make up to 80 percent of the Area Median Income (AMI) as determined by the U.S. Department of Housing and Urban Development. The AMI for Clark County is $56,550. Many programs are available for affordable housing; however, due to the timeline of Proposed Action construction, these programs may be unsuitable for the Proposed Action workers. Additionally, the project area is located in a rural setting, far from many urban housing options. There are hotels, motels and RV parks that may offer lodging opportunities in Alamo.

3.12.5 Lincoln County Master Plan

The existing Lincoln County Master Plan, adopted in December 2006, guides the county's growth; management of natural resources; provision of public services and facilities; and the protection of the public's health, safety and welfare. Proposed amendments for the Master Plan were developed in 2006 to address growth pressure in the county stimulated by ongoing growth in the Las Vegas area and by proposed large-scale developments in the county. The Master Plan is implemented by its policies, which are directly linked to, and consistent with, the zoning and land division ordinances.

The Master Plan identifies goals and policies for the development of public services and utilities to serve population and housing growth in Lincoln County. The goals for public services and utilities identify the need for such services to serve projected population and housing growth while integrating these services with the existing infrastructure. Policies provide a tool for the implementation of the Master Plan goals. Goals and policies that address public services and utilities, including the provision of water for new developments, are summarized below:

GOAL LUD-3: Public services and facilities should be financed and constructed concurrently with and by new development that will use that infrastructure.

Policy LUD-3A: Lincoln County Public Utilities, in coordination with the Planning Commission and other county agencies, should review all new projects to ensure that new public infrastructure costs directly associated with new development are paid by the new development. Future residential growth should be coordinated with local sewer and water providers, along with electrical and natural gas providers, to ensure that there is adequate capacity.

Policy LUD-3B: Addresses growth corridors, such as the Coyote Spring Valley and the Toquop Planning Area, to ensure that adequate public services and facilities can be provided and financed. Coordinate efforts of this Master Plan with the 1998 Lincoln County OEDP and the 1999 Lincoln County CEDS update.

3.12.6 Lincoln County and Clark County Fiscal Condition

According to the 1998 Lincoln County OEDP, the county government in 1997 was supported primarily by sales and property tax revenues. Intergovernmental revenues accounted for nearly 30 percent of county revenues and consisted of Supplemental City/County Relief Tax (SCCRT) revenue distributions, which accounted for nearly 30 percent of Lincoln County revenues. SCCRT is derived from sales in other counties and is distributed to Lincoln County by the state. The 1998 plan analysis of the 1997 budget concludes that the dependence on intergovernmental revenues by Lincoln County poses a risk to the provision of government services. The lack of significant in-county sales tax revenues is believed to be caused by economic/retail leakage and a narrow commercial/industrial economic base in the county.

The Lincoln County revenue and expenditure balances for Fiscal Years (FYs) 2004 and 2005 are shown in **Table 3-19**. The 2005 budget indicates that the SCCRT revenue distribution of $1.26 million was more than 20 percent of the total 2005 revenues, a decrease of about 10 percent from the 1997 proportion; however, as in 1997, the proportion of intergovernmental resources still accounted for around 60 percent in 2005.

Table 3-19
General Fund Revenues and Expenditures for Lincoln County FY ending 6/30/04 and FY ending 6/30/05

Category	Amount		Percent of Total	
	6/30/04	6/30/05	6/30/04	6/30/05
Revenues				
Property Taxes	1,413,637	1,412,649	15.8%	23.0%
Other Taxes	176,728	37,398	2.0%	0.6%
License & Permits	13,949	11,694	0.2%	0.2%
Intergovernmental Resources	6,327,504	3,645,028	70.7%	59.2%
Charges for services	543,148	495,534	6.1%	8.1%
Fines & Forfeits	340,661	409,741	3.8%	6.7%
Miscellaneous	135,157	133,837	1.5%	2.2%
Total revenues	**8,950,784**	**6,145,881**	**100.0%**	**100.0%**

Table 3-19 (continued)
General Fund Revenues and Expenditures for Lincoln County FY ending 6/30/04 and FY ending 6/30/05

Category	Amount		Percent of Total	
	6/30/04	6/30/05	6/30/04	6/30/05
Expenditures				
General Government	2,152,689	1,200,344	23.8%	17.6%
Judicial	791,809	742,175	8.7%	10.9%
Public Safety	2,354,503	1,721,225	26.0%	25.2%
Public Works	1,456,842	1,652,272	16.1%	24.2%
Sanitation	421,184	186,500	4.6%	2.7%
Health	148,338	164,633	1.6%	2.4%
Welfare	307,765	299,615	3.4%	4.4%
Culture & Recreation	365,692	128,231	4.0%	1.9%
Community Support	362,187	145,946	4.0%	2.1%
Intergovernmental Expenditures	30,487	45,033	0.3%	0.7%
Capital Projects	156,404	482,363	1.7%	7.1%
Debt Service – Principal	513,111	41,900	5.7%	0.6%
Debt Service – Interest	0	18,156	0.0%	0.3%
Total Expenditures	**9,061,011**	**6,828,393**	**100.0%**	**100.0%**
Excess of Revenues over (under) Expenditures	(110,227)	(682,512)		

Source: Nevada Department of Taxation 2006
FY – Fiscal Year

The Clark County revenue and expenditure balances for FYs 2004 and 2005 are shown in **Table 3-20**. The 2005 budget indicates that intergovernmental revenues of $319.3 million were 30.3 percent of the total 2005 revenues, just slightly more than the percentage in 2004 of 29.5.

Table 3-20
General Fund Revenues And Expenditures For Clark County FY Ending 6/30/04 and FY Ending 6/30/05

Category	Amount		Percent of Total	
	6/30/04	6/30/05	6/30/04	6/30/05
Property Taxes	213,130,117	237,128,773	22.9%	22.5%
Other Taxes	n/a	n/a	n/a	n/a
Licenses & Permits	143,686,830	159,868,130	15.5%	15.2%
Intergovernmental Revenue				
CTX[1]	264,091,201	313,642,515	28.4%	29.8%
Other Intergovernmental Revenue	9,934,831	5,683,762	1.1%	0.5%
Total Intergovernmental	274,026,032	319,326,277		
Charges For Services	73,146,892	88,027,159	7.9%	8.4%
Fines & Forfeits	10,153,620	12,916,684	1.1%	1.2%
Miscellaneous Revenues	8,508,057	14,936,081	0.9%	1.4%
Transfers In	206,594,236	219,794,772	22.2%	20.9%
Other Financing Sources	n/a	n/a	n/a	n/a
Total Revenues	929,245,784	1,051,997,876	100%	100%
Beginning Fund Balance	153,723,193	198,691,015		
Total Available Resources	1,082,968,977	1,250,688,891		

Table 3-20 (continued)
General Fund Revenues And Expenditures For Clark County FY Ending 6/30/04 and FY Ending 6/30/05

Category	Amount		Percent of Total	
	6/30/04	6/30/05	6/30/04	6/30/05
General Government	108,303,991	119,894,855	12.2%	12.2%
Judicial	95,814,462	102,130,423	10.8%	10.4%
Public Safety	147,890,711	155,264,446	16.7%	15.8%
Public Works	14,484,674	13,612,688	1.6%	1.4%
Sanitation	n/a	n/a	n/a	n/a
Health	17,141,009	19,900,651	1.9%	2.0%
Welfare	50,819,946	59,479,322	5.7%	6.0%
Culture and Recreation	29,996,265	30,371,153	3.4%	3.1%
Community Support	n/a	n/a	n/a	n/a
Debt Service	n/a	n/a	n/a	n/a
Intergovernmental Expenditures	n/a	n/a	n/a	n/a
Other General Expenditures	55,499,605	63,596,194	6.3%	6.5%
Operating Transfers Out	364,327,299	420,829,521	41.2%	42.7%
Total Expenditures	884,277,962	985,079,253	100%	100%
Ending Fund Balance	198,691,015	265,609,638		
Total	1,082,968,977	1,250,688,891		
Fund Balance as a % of Expenditure	22.5%	27.0%		
Population (as of July 1)	1,715,337	1,796,380		
Revenues Per Capita	542	586		
Expenditures Per Capita	516	548		

Source: Nevada Department of Taxation 2007, USFWS 2007b
n/a – not available
[1] CTX is the acronym for Consolidated Tax which is the consolidation of the Supplemental City-County Relief Tax (SCCRT), Basic City-County Relief Tax (BCCRT), Cigarette Tax, Liquor Tax, Motor Vehicle Privilege Tax (MVPT), and Real Property Transfer Tax (RPTT). The revenues from these taxes are pooled at the county level for distribution to the local governments under a single formula per Chapter 360, Nevada Revised Statues 360.600 through NRS 360.740.
FY – Fiscal Year

3.13 ENVIRONMENTAL JUSTICE

The ROI for analysis of environmental justice is the same as that of the socioeconomic analysis (Lincoln and Clark Counties).

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The analysis pursuant to this executive order follows guidelines from the CEQ *Environmental Justice Guidance under the National Environmental Policy Act* (CEQ 1997).

The project area is located in a rural, uninhabited valley. There are no minority or low-income populations in the project area. The community nearest to the project area is the unincorporated Town of Alamo, approximately 10 miles north of the project area. The project area is located approximately 25 miles north of the northern boundary of the Moapa Paiute Reservation.

Population and income statistics relative to the project area are described in section 3.12 (Socioeconomics).

3.14 HAZARDOUS MATERIALS AND SOLID WASTES

The ROI for hazardous materials and solid wastes includes the project area and any areas adjacent to the project area subject to disturbance by construction and operation of the Proposed Action and Alternatives including transportation routes for hazardous materials.

3.14.1 Hazardous Materials

Based on a review of EPA and the NDEP databases, there are no uncontrolled hazardous waste sites on or near the project area. There is no evidence of any historical land uses in the project area which might have utilized hazardous materials.

3.14.2 Solid Waste

Western Elite, Inc. operates a 40-acre construction waste facility on a private parcel immediately west of the intersection of Highway 93 and Kane Springs Road. The facility has been operational since 1996 and is classified as a Class III landfill. A Class III landfill is defined in NAC444.571 as a disposal site which accepts only industrial solid waste.

A permitted Class I landfill is in operation approximately 25 miles east of Panaca at Crestline. San Francisco-based Norcal Waste Service is seeking authorization from NDEP to operate a Class I landfill at the Crestline site. Lincoln County has included the proposed new landfill in the current revision of its Solid Waste Management Plan. Lincoln County's Solid Waste Management Plan was adopted in September 2000 and approved by NDEP in August 2001 (Dixon 2006).

3.15 PALEONTOLOGICAL RESOURCES

The ROI for paleontological resources includes the area adjacent to the proposed ROW, nearby off-site areas subject to disturbance from the Proposed Action or Alternatives, and those areas beneath new facilities that would remain inaccessible for the life of the Proposed Action.

Local geological maps and literature were assessed for the potential presence of paleontological resources in the project area. The project area of direct effects is located entirely within Holocene and late Pleistocene alluvial deposits (Swadley et al. 1994). These deposits do not generally contain fossils. An exception may be the presence of Holocene and late Pleistocene vertebrates, charcoal remnants and rodent middens.

Fossil-bearing outcrops of early Permian and late Mississippian beds of limestone, dolomite and sandstone may be exposed in the ROI. These Permian and late Mississippian limestone beds are not exposed in Kane Springs Valley, as the beds are buried with up to 33 feet of Quaternary alluvium. The early Permian and late Mississippian members are estimated to be approximately 3,116 feet thick. These fossil-bearing outcrops are known to contain fossils of corals, brachiopods, bryozoans and gastropods (Webster 1969). Duncan and Gordon (no date) cited in

Tschanz and Pampeyan (1970) reported a late Mississippian limestone outcrop near the junction of Kane Springs Wash and Highway 93 that contained fossil *Vesiculophyllum* sp. and crinoid columnals (corals).

During the course of intensive archeological inventory of the APE for the proposed ROW corridor, efforts were made to note surface evidence of paleontological resources. No paleontological remains on the surface were observed; however, buried Holocene and late Pleistocene vertebrates, charcoal remnants and rodent middens may be present.

3.16 ARCHAEOLOGICAL RESOURCES AND HISTORIC PROPERTIES

Extensive investigation of archaeological resources and historic properties has been sparse in southeast Nevada, but new data are being contributed rapidly to better define a culture history for the region (Cordell 1997). Few stratified sites have been identified, and fewer still have been excavated. Given these limitations, investigators in the region have been forced to rely on a generalized understanding of cultural historical sequences. As a result of these factors, southeastern Nevada remains an area for continuing archaeological and historical research.

The established culture history in the region and associated research domains can be found in the Eastern Nevada, Southern Nevada and Historic Study Units of the Archaeological Element for the Nevada Historic Preservation Plan (Lyneis 1982). Ezzo (1995) provides a revised cultural history of the Moapa and Virgin Valleys in Nevada. The riverine adaptation may have little relevance to the upland Mojave Deseret cultural ecological situation for this Proposed Action. Similarly, the culture history established by Fowler et al. (1973) for the area of upper Meadow Valley Wash and the Pahranagat Valley may not apply well to the extreme xeric environment of Kane Springs Wash. To the west, there is an established cultural historical sequence as a result of research on the Nevada Test Site (Haarklau et al. 2005). To the south, a sequence has been established for the northern margin of the Las Vegas Valley (Ahlstrom and Roberts 2001).

The Nevada Comprehensive Preservation Plan (Bernstien et al. 1989) establishes preservation themes for the historic period in Nevada, many of which are relevant to this region (for example ranching and farming, historic landscapes, the public domain, exploration and early settlements, railroads, and mining). To assess archeological resources and historic properties in the Ely District, a probability model developed by Drew and Ingbar (2004) was used to establish a baseline for expected site types and frequencies that may occur in the project area. **Table 3-21** reflects the chronological sequence applicable to the region, associated artifacts and reference citations for previous studies conducted for these resources.

3.16.1 Cultural History

Archaeologists have divided the 12,000-year period during which people have inhabited the Southern Nevada Region into sequences of periods (**Table 3-21**). The division of the time into periods serves several functions. First, they can track changes in the lifeways of the people who inhabited a region in the past. For example, the distinction between the Late Archaic and Late Prehistoric periods is based in part on the introduction of bow-and-arrow technology at the beginning of the later period.

Table 3-21
Cultural Resource Sequence

Time Period	Type Sites/Artifacts	References
Paleoarchaic Period (9500 – 5500 BC)	Tule Springs / Tule Springs and Lake Mojave period lanceolate and stemmed points. Pinto Basin projectile ponts and small cobble manos.	Grayson (1993) Ahlstrom and Roberts (2001)
Middle Archaic (5500 –3000 BC) and Late Archaic (3000 BC – AD 300) Periods	Pinto Basin projectile points, flake choppers, flake scrapers and shallow-basin metates. Gypsum Cave / Gypsum series projectile points. Milling implements (manos and metates) and stone-lined storage bins.	Harrington (1933) Lyneis (1982) Warren and Crabtree (1986) Ahlstrom and Roberts (2001)
Late Prehistoric (AD 300 –1800) and Ethnohistorical (AD 1800 – 1900) Periods	Rose Springs and Cottonwood-series projectile points, a variety of pottery, manos and metates, and storage cists. Basketry sandals, figurines, pipes, bone and horn dishes and spoons, and shaft wrenches.	Steward (1938) Fowler (1994) Seymour (1997) Ahlstrom and Roberts (2001)
Historical Period (AD 1540 – 1950)	Artifacts associated with railroads, trails, roads, mines, farms, ranches, homesteads, telegraph and telephone lines, and refuse dumps.	Hafen and Hafen (1954) Myrick (1962) Elliot (1973) James (1981)

Previously, hunters had used an implement called the “atlatl” to propel projectiles known as “darts” at their prey. Second, the periods can reflect the kinds of evidence that are available for studying the past. For example, for all of the periods up through the Late Prehistoric period, the primary evidence for studying the past consists of archaeological remains, whereas for the Historical period, documentary evidence plays the primary role. Third, periods serve as an important aspect of the “historic contexts” that provide the basis for determining if archaeological sites and other historic properties are eligible for the NRHP (henceforth the National Register). These contexts include the three components of place, time (period), and theme (NPS 1986, 2006).

3.16.1.1 Paleoarchaic Period (9500 to 5500 BC)

The Paleoarchaic period combines what have previously been referred to separately as the Paleoindian and Early Archaic periods. In geologic time, this combined period corresponds to the end of the Pleistocene and beginning of the Holocene epochs. Great Basin archaeologists generally distinguish two artifact traditions within the Paleoarchaic period: the Clovis (Paleoindian) tradition and the Stemmed Point tradition (Grayson 1993). Data compiled by Willig and Aikens (1988) suggest that the Clovis tradition predated the Stemmed Point tradition by several centuries. Research conducted by Jones et al. (2003) indicates that Paleoarchaic foragers living in the Great Basin obtained obsidian toolstone within “conveyance zones” (areas that were coterminous with the foraging territories of Paleoarchaic populations) that cover a large area in some cases. The project area is likely located within one of these zones, as there are small obsidian nodules spread throughout the valley that likely originated from the Kane Springs Wash volcanic center, which is northeast of the project area. These obsidian nodules would have provided an opportunistic resource for manufacturing stone tools. Chipped obsidian nodules (tested cobbles) identified at several previously recorded sites in Kane Springs Valley suggests that the prehistoric inhabitants were utilizing this resource.

Although Paleoarchaic period sites are extremely rare, one such site (Iola's Site) is located within Kane Springs Valley. This site is several miles northeast of the project area.

3.16.1.2 Middle Archaic (5500 to 3000 BC) and Late Archaic (3000 BC to AD 300) Periods

The Archaic Tradition is characterized by a broad-spectrum adaptation to the animal and plant resources of a Holocene environment that resembled the Great Basin's historic and modern-day environment. During the Middle Archaic period, the climate may have been substantially hotter and drier than at present. Characteristic artifacts of the Middle and Late Archaic periods include large projectile points (relative to later arrow points) which would have been hafted to darts that were propelled with atlatls. Grinding tools appear to be an important part of tool assemblages dating to the Middle Archaic, and they are common in Late Archaic assemblages. These tools imply that users had a greater reliance on hard-seed foods in this period than during the Paleoarchaic period.

People of the Middle and Late Archaic period likely traveled through Kane Springs Valley, as it was a natural east-to-west corridor in an otherwise very mountainous region. As in the Paleoarchaic period, obsidian nodules in Kane Springs Valley would have been sought out as a material for stone tool manufacturing.

3.16.1.3 Late Prehistoric (AD 300 to 1800) and Ethnohistorical (AD 1800 to 1900) Periods

The post-AD 300 portion of the Prehistoric period has been referred to as the Late Prehistoric period (Buck et al. 1998), the Late Archaic period (Zeanah et al. 2004), and the Saratoga Springs and Shoshonean periods (Warren and Crabtree 1986). The Late Prehistoric period began with the adoption of the bow and arrow, either as a replacement for or alternative to the atlatl and dart. Based on arrow point styles, it is possible to divide the Late Prehistoric period into early and late (pre- and post-AD 1200/1300) sub-periods (Warren and Crabtree 1986).

The project area lies just outside the southwestern edge of the area mapped by Madsen and Simms (1998) as representing the maximum extent of the "Fremont Complex." Whereas areas of Fremont occupation are located to the north and east of the project area, a major population center of the Virgin Branch prehistoric puebloans (the Anasazi) is located south of the project area. That center lies in the combined Moapa and Virgin Valleys of southeastern Nevada.

The Late Prehistoric period transforms into the Ethnohistorical period by the early 1800s. The transition is a function of data sources: the Late Prehistoric period is evidenced primarily through archaeological evidence, whereas the Ethnohistorical period is also known from projections backward in time of ethnographic and other accounts from the late nineteenth and early twentieth centuries.

The project area is located in Southern Paiute territory, within the Pahranagat subarea (Kelly and Fowler 1986). The Southern Paiute practiced a hunting and gathering way of life, supplemented to varying degrees from sub-area to sub-area by farming.

3.16.1.4 Historical Period (AD 1540 to 1950)

Although the Spanish entered the Southwest beginning in the 1540s, documentation of direct contact between the Southern Paiute and Europeans did not occur until 1776, when the Spanish priests Francisco Garcês, Francisco Domìnguez and Escalante first made contact with the Southern Paiute (Kelly and Fowler 1986). The purpose of this expedition was to establish a route between the New Mexican capital of Santa Fe and the Alta California capital of Monterey.

Euroamericans passed through southern Nevada during the first half of the nineteenth century, but did not settle there. Many used the Virgin River Valley, south of the project area, as a travel corridor, including explorers like Jedediah Smith (in 1826), Antonio Armijo (in 1829), and John C. Frémont (in 1844) (Sterner and Ezzo 1996).

By the late 1850s, Mormon settlements had displaced Southern Paiutes from their traditional agricultural and gathering lands, which became further depleted by livestock grazing and other ranching and farming activities (Kelly and Fowler 1986).

Mining occurred near the project area in the Pahranagat Valley when, in 1865, William H. Raymond moved his mill from California to process the ores in the valley. However, the venture was not successful and as the ores dwindled Raymond and his mining partner, John H. Ely, moved the mill operations to Meadow Valley.

The topography of the region has restricted most transportation corridors to the narrow basins set in between the rugged mountain ranges. One such route includes SR 93, which was constructed in the 1930s. A segment of this highway crosses the project area; however, it was abandoned in the 1960s and rerouted a few miles to the west. The first documented road through Kane Springs Valley was illustrated on the 1881 General Land Office survey plat. This historic road was plotted more than 0.5 miles north of the current Kane Springs Road. Because Kane Springs Valley is a natural east-to-west corridor from Coyote Spring Valley to Meadow Valley, it seems likely that trails have existed in this valley since prehistoric times, though none have been documented.

3.16.2 Region of Influence

There has been little previous inventory or evaluation of archaeological resources and historic properties within the APE. The BLM is moving toward the use of watershed-based assessments to identify and analyze archeological resources and historic properties within their jurisdiction (BLM 2005). The Draft Ely RMP/EIS lists 13 categories of archeological resources and historic properties ("site types") that may occur within the management area. **Table 3-22** compares site types known to occur within the region to those that may occur in the APE.

A Class I records review conducted for the Proposed Action identified a total of 33 cultural resource studies previously conducted in the area, with a total of 27 sites recorded as occurring within 1 mile of the project area. These sites include 26 prehistoric artifact scatters and one historic highway. Of these, three were previously recorded as occurring within the APE. Two of the sites were recorded as artifact scatters, and the third site (a historic highway) consists of a segment of the old Highway 93.

Not all sites identified in the APE are eligible for listing on the National Register. Previously recorded sites located within the APE are listed in **Table 3-23** below:

Table 3-22
Archeological Resources and Historic Properties Occurrence within the APE and Region

Parameter	APE	Region
Historic roads, trails, railways, highways, and associated sidings and stations	Historic roads and trails from General Land Office and Wheeler Survey maps. These include the old Highway 93 and the Coyote Spring Roadhouse	Railroad adjacent in Meadow Valley Wash
Rock art sites	None	Kane Springs Rock Art Site (Henderson 2007)
Historic townsites, mining camps, mining districts, buildings and standing structures	None. Gravel extraction at Coyote Spring and perlite extraction in Kane Springs Wash have occurred within the last 50 years.	Delamar Mining District on the northeast side of the Delamar Mountains; Viola Mining District, located east of Elgin in the Clover Mountains; and Gourd Springs Mining District, located east of the Mormon Mountains.
Cemeteries, isolated gravesites/burials	None	Cemeteries may be associated with the historic mining districts listed above.
Ethnic arboreal narratives, graphics, and bow stave trees	None	The margins or uplands of the Kane Springs and Coyote Spring watersheds may contain these resources.
PaleoIndian sites (artifact scatters)	Fluted points have been documented and collected in Kane Springs Wash.	Fluted points have been documented and collected in Kane Springs Wash.
Formative Puebloan Sites (dry masonry structures, pithouses, pits and artifact scatters)	None	None.
Prehistoric Complex Sites, Campsites or specialized activity areas (artifact scatters, storage pits, roasting pits and rock alignments)	None	None

Table 3-22 (continued) Archeological Resources and Historic Properties Occurrence within the APE and Region		
Parameter	**APE**	**Region**
Rock shelters and cave sites	None	The margins or uplands of the Kane Springs and Coyote Spring watersheds may contain these resources; however, none have been documented.
Tool stone sources or quarries (lithic scatters)	Isolated occurrence associated with the Kane Springs tool stone sources	Isolated occurrence throughout the region
Ranching and livestock related historic sites, buildings, standing structures and landscapes	Facilities associated with historic water development and homesteading	Facilities associated with historic water development and homesteading
Ethnohistoric sites, sacred sites, traditional use areas and traditional cultural properties	None	None have been identified during previous investigations (Woods 2003) or during Tribal coordination activities.
Other (agave roasting pits, intaglios, geoglyphs, antelope walls, historic debris scatters, non-mining and non-ranching features)	Geoglyphs, such as the Sunflower Mountain geoglyph, may occur on watershed margins in areas that provide views of the surrounding landscape.	Geoglyphs may occur on watershed margins in areas that provide views of the surrounding landscape.

ROI – Region of Influence

Table 3-23 Previously Recorded Sites within the APE			
Site Number	**Jurisdiction**	**Description**	**National Register Eligibility**
26LN3723	BLM Ely District	Historic Highway 93	Not Eligible
26LN2848	BLM Ely District	Prehistoric artifact scatter	Not Eligible
26LN4001	BLM Ely District	Prehistoric artifact scatter	Not Eligible
BLM – Bureau of Land Management			

Consulted Tribes did not identify any cultural significant areas in the ROI (see **Table 3-22** and Section 5.2). Contacted Tribes did not specifically identify any of the other previously recorded archaeological sites as culturally significant.

3.16.3 Area of Project Direct Effects

An intensive pedestrian archeological inventory (Class III survey) was conducted for the Proposed Action in November of 2006 (HRA and ARCADIS 2007). The survey corridor encompassed a 300-foot wide area (725 acres) APE that included: 1) the 60-foot wide permanent ROW, 2) the temporary 75-foot wide construction ROW, and 3) an area of approximately 100 feet by 200 feet that would be needed during construction for equipment storage and ancillary features. The Class III survey identified no new sites and 61 isolated occurrences within the APE. The isolated occurrences consisted of chipped stone debitage/debris from tested obsidian, chert and quartzite cobbles. Of the three previously recorded non-eligible National Register properties identified in the project APE, only old historic Highway 93 (26LN3723) was located during the Class III survey. The sites previously identified as prehistoric artifact scatters (26LN2448 and 26LN4001) were not located, and may be either obliterated or buried as a result of erosional processes or they may not have been accurately plotted when first recorded.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter evaluates the environmental consequences that would result from implementation of the Proposed Action or Alternatives. The Proposed Action and Alternative 1 differ in the location of the 138 kV transmission line and fiber optic line between Highway 93 and the Emrys Jones Substation. The groundwater and electric utility facilities east of Emrys Jones Substation would be the same under both the Proposed Action and Alternative 1. Under the Proposed Action, the 138 kV transmission line and fiber optic line between Highway 93 and the Emrys Jones Substation would be located on private or leased lands along the Kane Springs Road ROW. Under Alternative 1, all electric utility facilities would be located within the 2,640-foot wide LCCRDA utility corridor on BLM-administered public lands (see **Map 2-1**).

The impact analysis for environmental consequences focuses on potential direct, indirect and cumulative effects on resources described in Chapter 3.0 - Affected Environment. Direct effects are impacts that are "caused by the Proposed Action and occur at the same time and place" (40 CFR 1508.8). For the Proposed Action, direct effects are those impacts resulting from the granting of the ROW by the BLM and subsequent construction and operation of the proposed facilities that would function to withdraw groundwater. The actual withdrawal of the groundwater is considered an indirect effect as explained below and in detail in Section 4.3.

Indirect effects are those impacts that are "caused by the Proposed Action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8). Indirect effects may include the effects of the withdrawal of groundwater, growth-inducing effects and other effects related to induced changes in the pattern of land use, changes to the population density or growth rate, and related effects on the physical attributes of associated ecosystems.

The cumulative effects analysis is focused on the potential effects (direct and indirect) of construction, operation and maintenance of the Proposed Action combined with other past, present and reasonably foreseeable future actions that could have effects in the ROI. As described in Chapter 3.0, the ROI varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action.

Assumptions for Analysis

Certain assumptions were considered when analyzing effects of the Proposed Action on the environment. For example, the BLM has no jurisdictional authority over water rights, pumping rates, distribution, use, and volume of water to be pumped and conveyed through the Kane Springs Valley Groundwater Development Project. The Nevada State Engineer has addressed issues pertaining to groundwater withdrawal from the Kane Springs Valley Hydrographic Basin during his review of applications for the respective water rights. While the State Engineer has granted an appropriation of 1,000 AFY to the LCWD for groundwater withdrawal within the Kane Springs Valley Hydrographic Basin, the LCWD's ROW application to the BLM is for a project designed to develop and convey up to 5,000 AFY of groundwater from the Kane Springs Valley to the northern end of the Coyote Spring Valley. Therefore, the analysis in this EIS is reflective of how environmental, social, and economic resources would be affected as a result of the Proposed Action described in Chapter 2.

It is also important to note that project features described in Chapter 2 were designed only to the feasibility level, which represents reasonable approximations for assessing potential project impacts. When engineering designs are complete, the Applicant will submit a final Plan of Development (POD) that incorporates site-specific stipulations, and terms and conditions associated with the ROW grant.

Incomplete and Unavailable Information

The CEQ (1502.22) requires agencies to obtain information if it is "relevant to reasonably foreseeable significant adverse impacts;" if it is "essential to a reasoned choice among alternatives;" and if "the overall costs of obtaining it are not exorbitant." The costs are measured not only in money, but also in time.

Environmental resource data were collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives.

Due to the uncertainties related to natural systems, there are differences of opinion about regional groundwater flow and groundwater availability in the Kane Springs Valley Hydrographic Basin. Several authors have studied flow systems in the region; however, only limited site-specific data are available. Groundwater flow through Kane Springs Valley was approximated by CH2MHILL (2006a); however, the Nevada State Engineer did not accept several of the findings from this study and instead relied primarily on the older work of the State Engineer's Office (USGS 1971) and Eakin (1964).

The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. However, there is a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved.

4.1 GEOLOGIC RESOURCES

4.1.1 Proposed Action

4.1.1.1 Geology

Construction activities would be limited to shallow-depth trenching (up to 6 feet) within the granted ROW. Project construction would occur in three phases and would include drilling, testing and completion of up to six additional wells and appurtenant facilities. Exact locations for each well have not been determined; however, current project design indicates that each well would be spaced approximately 1.3 to 1.8 miles apart beginning at KPW-1. Final well locations would be based on additional geologic and hydrogeologic investigations. The Applicant would adhere to Nevada rules and regulations such as those listed in NRS Chapter 534 and applicable industry standards regarding drilling, testing and completion procedures during well construction. No direct or indirect impacts to geologic resources from construction activities would occur under the Proposed Action.

Groundwater withdrawal from the proposed wells and use of water for development would not affect geologic resources in the project area. No direct or indirect impacts to geologic resources from project operation and maintenance would occur under the Proposed Action.

4.1.1.2 Seismicity

Seismic activity occurs in the project area and would be expected to occur in the future in response to natural processes. Construction, operation and maintenance of the Proposed Action would have no direct or indirect impacts on seismic activity in the area. However, seismic activity may potentially impact project components.

All project components would be constructed and operated in accordance with applicable regulations and engineering protocols and safety standards to minimize potential impacts to structures (including pipeline) from seismic activity (**Table 1-2**). Environmental consequences related to pipeline breaks or leaks (such as those resulting from seismic activities) are addressed in Section 2.1.3.3.

4.1.2 Alternative 1

Impacts to geologic resources under Alternative 1 would be the same as those described under the Proposed Action.

4.1.3 No Action Alternative

Under the No Action Alternative, the ROW on federal lands would not be granted. No ground disturbance associated with either the Proposed Action or Alternative 1 would occur, and no facilities would be constructed on the BLM lands. No project-related impacts to geologic resources would occur under this alternative.

4.1.4 Mitigation

No mitigation is required.

4.2 SOIL RESOURCES

4.2.1 Proposed Action

Approximately 195 acres would be temporarily disturbed during construction of the Proposed Action, of which approximately 167 acres are managed by the BLM. Approximately 25 acres would be permanently impacted by project components (well yards, access roads and overhead poles). All disturbances would be located within the permitted 100- to 150-foot wide ROW.

Short-term direct impacts that would result from construction activities include increased soil compaction and erosion from wind and water, and chemical changes resulting from mixing surface soils with subsoil during salvage activities. These effects would be influenced by the extent of disturbance, surface soil texture, soil cover, slope steepness and intensity of storm events.

Soils would have an increased susceptibility to erosion after construction until vegetation can reestablish. This increased susceptibility to erosion would be compounded in areas within the area that was burned in 2005. Higher erosion rates after fires can result from 1) the decrease in litter and vegetative cover, 2) changes in soil properties including the loss of organic matter and formation of a water-repellent layer, and 3) increased rill erosion due to the increase in overland flow.

Shallow depth excavations may pose certain construction challenges depending on the depth to bedrock, slope and presence of cemented pans in a particular area. In these areas, special construction procedures may be required.

As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater to the LCWD service territory. Procedures described in Section 2.1.3.3 - Operations and Maintenance would minimize impacts to soils during operation and maintenance of the Proposed Action. Full build out of the Proposed Action, under Phases 2 and 3, would maximize delivery up to 5,000 AFY to the LCWD service territory. Full build out would not generate additional impacts on soil resources. The environmental protection measures to minimize or avoid impacts to soil resources during construction are referenced in Section 2.1.4 - Applicant Proposed Environmental Protection Measures. These measures would be applied under Phase 1 of the Proposed Action and would be sufficient to minimize impacts of the build out condition.

The selected erosion and sediment control BMPs and environmental protection measures would be based on the type of disturbance expected, soil type and the location of the site relative to sensitive resources. Detailed environmental protection measures specific to soil resources can be found in **Appendix C** - Standard Construction and Operation Procedures (Reference Numbers ESC-1, ESC-2, ESC-3, ESC-4, ESC-5, ESC-6, ESC-7, PUCC-1, PUCC-2, PUCC-3 and V-3).

4.2.1.1 Landslides and Subsidence

Within the ROI, slopes are primarily level to gently sloping. The risk of landslides should not be significantly increased by the construction of the Proposed Action.

No caves or sinkholes have been identified in the ROI; however, the regional carbonate aquifer also can be highly fractured in some areas and might contribute to the formation of future cave features. Land subsidence can occur from compaction of the aquifer system, dissolution and collapse of rocks that are relatively soluble in water and dewatering of organic soils. Subsidence primarily occurs where groundwater drawdown occurs in unconsolidated sediments, namely valley fill deposits. Groundwater pumping associated with the Proposed Action would occur in the deep carbonate-rock aquifer at depths greater than 900 feet bgs. The Proposed Action would have no affect on valley fill deposits or contribute to land subsidence in the ROI.

4.2.2 Alternative 1

Under Alternative 1, the 138 kV transmission line and buried fiber optic line would be located within the designated LCCRDA utility corridor between Highway 93 and the Emrys Jones Substation. Map units along this alternative include Weiser-Tencee and Kurstan-Tencee soils in the upland areas and Arizo-Bluepoint soil within the drainages of the Kane Springs Wash.

Installation of the overhead power lines and buried communication line would require clearing and grading of the alignment. All construction would occur within a 100-foot wide construction easement, which would result in disturbing up to 36 acres of undisturbed desert lands. After construction, disturbed areas adjacent to the permanent access dirt road would be reclaimed to pre-construction conditions.

Routine maintenance activities may require cross-country travel along the reclaimed area. Motorized travel would be limited to the permanent ROW.

4.2.3 No Action Alternative

Soil resources on federal lands would not be disturbed under the No Action Alternative.

4.2.4 Mitigation

To ensure adequacy of the selected sediment and erosion control measures, including dust control measures, the BLM would monitor the effectiveness of the Environmental Protection Measures described in **Appendix C** and would recommend additional protection measures if deemed necessary.

4.3 WATER RESOURCES

4.3.1 Proposed Action

Potential impacts to water resources resulting from Proposed Action can be divided into two general categories:

- Direct and indirect impacts resulting from project construction, and
- Direct and indirect impacts resulting from project operation and maintenance.

4.3.1.1 Impacts to Surface Water

Use of heavy construction equipment would cause compaction of near surface soils that could result in increased runoff and sedimentation from disturbed areas during heavy rain events. As outlined in Chapter 2.0, the LCWD and its contractors would implement engineering controls and site-specific BMPs (presented in **Appendix C**) to minimize erosion and sedimentation during construction. In addition, the LCWD has developed a SWPPP that describes appropriate measures to minimize environmental impacts from sedimentation. Measures in **Appendix C** that would avoid adverse impacts on surface water quality from sedimentation and erosion include ESC 1-7, LP 1-7, R 13-15 and WP 3-5.

The proposed ROW would cross 11 ephemeral drainages including four crossings of Kane Springs Wash. One crossing of Kane Springs Wash would be located in the far upstream portion of the project area, and three would be halfway between the northern and southern extents of the project area. All ephemeral drainages within the project area are tributaries to Kane Springs Wash. These drainages are normally dry and only flow during periods of heavy rainfall, which are most often associated with summer thunderstorms. Potential impacts may result from suspension of sediment caused by in-stream construction and erosion of cleared stream banks and ROWs. Construction activities within these drainages would be localized and short-term. All drainage crossings would be restored at the completion of pipeline construction, and no changes in drainage patterns would be anticipated. Restoration and reclamation measures are presented in **Appendix C**.

Water discharges from hydrostatic testing would be localized, and the rate would be controlled to minimize impacts. Excess water would be discharged into natural drainage areas around each site. A diffuser, rock rip-rap or other erosion control measure 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. The LCWD would obtain a temporary NPDES permit prior to construction. In addition, the LCWD has developed a Hydrostatic Discharge Plan that describes appropriate measures to minimize environmental impacts.

Spills resulting from storage, handling and disposal of fluids from drilling boreholes present potential for surface contamination. These fluids would primarily be composed of water with additives or organic polymers. The drilling fluids would be disposed of through evaporation of the water and drying of the additives in shallow depressions. All drilling fluids would be stored and handled according to environmental protection measures outlined in the SPCCC Plan developed for the Proposed Action.

The potential for accidental spills and leaks of equipment fluids, such as gasoline and oil, increases during construction activities. Potential spills from vehicle refueling, equipment failure and storage of hazardous substances could cause surface contamination. The LCWD has developed an SPCCC for the Proposed Action which outlines spill prevention practices, emergency response and cleanup procedures, and storage protocols. All contractors involved with the construction of the Proposed Action would be required to adhere to the protocols outlined in the SPCCC. Impacts from accidental spills and leaks would be avoided by application of measures LP-5, WP-7 and HM 1-12 in **Appendix C.**

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 Kane Springs Valley 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 Kane Springs Valley.

The only perennial surface water features in the ROI and Hydrographic Basins of interest include the Pahranagat and Nesbitt Lakes in the Pahranagat Valley, Meadow Valley Wash, and Muddy River. Perennial surface water features in Pahranagat Valley would not be affected by groundwater pumping in Kane Springs Valley due to its location (upgradient) and distance from the pumping wells, as well as the presence of the Pahranagat Shear Zone, which according to Burbey (1997) represents a partial barrier to groundwater flow.

Similarly, no impacts from pumping would be anticipated to Meadow Valley Wash due to lack of hydraulic connection with the regional groundwater in the Kane Springs Valley. Regional groundwater in the Lower Meadow Valley Wash Hydrographic Basin is part of a separate groundwater flow system.

The source of the Muddy River is a series of regional springs located approximately 28 miles southeast of the project area within the downstream Muddy River Hydrographic Area. Potential impacts on Muddy River Springs from the Proposed Action are discussed in Section 4.3.1.5.

4.3.1.2 Impacts to Groundwater

The depth to groundwater in the project area is 900 feet or greater bgs (URS 2006a). Surface disturbance associated with construction is not expected to impact groundwater.

According to the CH2MHILL (2006a) study, the average annual recharge to groundwater in the Kane Springs Valley Hydrographic Basin is estimated to be on the order of 5,000 AFY. The study concluded that at least 15,000 AFY of groundwater flows through the carbonate aquifer system within the Kane Springs Valley Hydrographic Basin, and the perennial yield was estimated to be on the order of 5,000 AFY based on the recharge analysis developed by Walker (2006). An older study by Harrill et al. (1988) reported an estimated perennial yield of 500 AFY. The perennial yield is defined by the Nevada Division of Natural Resources as the amount of usable water from a groundwater aquifer that can be economically withdrawn and consumed each year for an indefinite period of time. It cannot exceed the natural recharge to that aquifer and ultimately is limited to the maximum amount of discharge that can be utilized for beneficial use.

In February 2007, the Nevada State Engineer permitted the LCWD to pump up to 1,000 AFY of groundwater from the Kane Springs Valley Hydrographic Basin (NDWR 2007b). Up to 500 AFY would be pumped from the existing KPW-1 well, and a combined duty of an additional 500 AFY would be pumped from the three other permitted points of diversion (see section 3.3.3.3.1 for summary of the Nevada State Engineer Ruling 5712).

The Nevada State Engineer has sole authority for establishing perennial yields within each basin. The case for increasing the perennial yield from 500 to 5,000 AFY was presented by the LCWD (based on CH2MHILL studies summarized in CH2MHILL 2006a and 2006b) to the Nevada State Engineer in April 2006. The Nevada State Engineer originally recognized the perennial yield of the Kane Springs Valley Hydrographic Basin to be less than 500 AFY based on an older Eakin (1964) analysis. However, based on new information provided during the hearings, and the uncertainty in perennial yield calculations, the Nevada State Engineer limited groundwater extraction under the previously filed applications to 1,000 AFY (NDWR 2007b).

In April 2006, the LCWD submitted additional groundwater appropriation applications to the Nevada State Engineer for pumping up to 17,000 AFY in the Kane Springs Valley Hydrographic Basin. The hearings for these applications have not occurred. As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater to the LCWD service territory. Full build out of the Proposed Action, under Phases 2 and 3, could maximize delivery up to 5,000 AFY to the LCWD service territory and would depend on the allocation of additional water by the State Engineer.

Depending on the accuracy of the perennial yield analysis, direct and indirect impacts could occur from groundwater withdrawals. Both the Applicant and various federal and state agencies are currently conducting additional studies to refine the accuracy of previous estimates of perennial yield. Potential indirect impacts would be related to lowered yields at local and regional springs and impacts to local water users. Potential direct and indirect impacts from groundwater withdrawals are described in the following sections.

4.3.1.3 Impacts to Groundwater Quantity

Impacts to groundwater quantity would consist of removing groundwater at the proposed volumes from the regional carbonate aquifer and transferring this water to the Coyote Spring Valley area. As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater from four wells. Full build out of the Proposed Action, under Phases 2 and 3, could maximize delivery up to 5,000 AFY to the LCWD service territory.

Groundwater removal from soil results in a cone of depression (zone of influence) around the pumping wells. Extraction of groundwater from an aquifer can be described mathematically using equations, the purpose of which is to help predict the change in the groundwater elevation as a function of the extraction rate. For the purpose of analyzing systems where only preliminary aquifer data are available, it is common practice to use an equation derived by Theis (1935). This equation requires only two parameters (transmissivity and storativity) to permit calculation of the change in the groundwater elevation (also called drawdown) at some distance from an extraction well depending on the pumping rate and elapsed time.

To enable the calculation to be performed with only two parameters, certain assumptions concerning the geometry of the aquifer are required. These assumptions and their applicability to Kane Springs Valley include:

- The aquifer should be confined; in practice, this means that the sedimentary layer defined as the aquifer have other overlying sediments that restrict the inflow of water from a surficial aquifer. This assumption is met in the current case of extraction from the deep carbonate aquifer, for which the aquifer test yielded a storage coefficient of 1×10^{-4}.
- The aquifer is isotropic and homogeneous with respect to transmissivity and storativity, and the water flows toward the well in a circular, radially symmetric manner from an infinite distance. In the current situation, flow toward the well may not be radial due to the wells' locations within the Kane Springs Wash Fault Zone. In this case, the theoretical cone of depression (area subject to drawdown of the groundwater surface) may be oval rather than circular with less drawdown within the more permeable fault gauge and greater drawdown toward the center of the basin. Impermeable fault zones could also negate the infinite extent assumption by providing a barrier to flow. However, due to the unknown geometry of the Kane Springs Wash Fault system and the potential for further focusing by the Willow Spring Fault, it is believed that the Theis approach provides a reasonable method for estimating the maximum impacts (drawdown) prior to project development.

- A single well is used as a proxy for extraction from multiple wells. In order to achieve the desired extraction of 5,000 AFY, more than one well would be needed (four are proposed). For an infinite isotropic aquifer, the drawdown does not depend on the spacing of the pumping wells. It may result in less drawdown at each individual pumping well because of the lower rate at each, but the total effect is additive, and a monitor well at some distance will experience about the same drawdown as if the pumping were from a single well.
- The effect of the storage coefficient on the drawdown is greatest near a well or immediately after the start of pumping. At longer times or greater distances, an order of magnitude change in storage coefficient will result in a relatively small change in the drawdown. A storage value of 10^{-4} was calculated from the CH2MHILL (2006a) study. Storage terms likely vary within the carbonate aquifer on the scales we are assessing and an average value can only be obtained by observing water level response to long-term pumping stress. Although this storage value was from a 7-day test, it is reasonable based on the geologic conditions and is the only estimate derived from site-specific data.

The 100-year drawdown was predicted by CH2MHILL (2006a) for two transmissivity values, one representative of local aquifer conditions affected by the Willow Springs Fault (300,000 gpd/ft) and another representative of a lower value, which would be more applicable for a long-term pumping estimate (150,000 gpd/ft). Prudic et al (1995) estimated the regional transmissivity in the Coyote Spring area at 200,000 gpd/ft, indicating that the CH2MHILL transmissivity values are reasonable estimates. These two estimated values of transmissivity are used below to calculate a range of expected results from the proposed groundwater pumping.

As seen in **Table 4-1**, after 100 years, the expected drawdown 1 mile from the extraction point would vary between 4 and 30 feet depending on the extraction rate and the values of transmissivity selected. For an extraction rate of 1,000 AFY, the drawdown at 1 mile would be between 4 and 6 feet, while at an extraction rate of 5,000 AFY, the drawdown would increase to between 16 and 30 feet. Similar calculations were performed to calculate the effect at 10 miles from the pumping area (Bushner 2007). These are also shown in **Table 4-1**.

Table 4-1
Theis Solution for Drawdown Due to Aquifer Pumping for 100 Years

Transmissivity (gpd/ft)	**Predicted maximum drawdown while pumping 1,000 AFY at distance**		**Predicted maximum drawdown while pumping 5,000 AFY at distance**	
	1 mile	10 miles	1 mile	10 miles
150,000	6 feet	3 feet	30 feet	20 feet
300,000	4 feet	2 feet	16 feet	11 feet

Source: CH2MHILL 2006a
AFY – acre-feet per year gpd/ft – gallons per day per foot

These calculations suggest that, at 10 miles from the extraction area (approximate distance to the Coyote Spring Hydrographic Basin), the drawdown could be between 2 and 20 feet depending on the extraction rate. However, this calculation likely overestimates the extent of the drawdown outside of the Kane Springs Valley because it is expected that the Kane Springs Wash Fault would act as a barrier to flow out of Kane Springs Valley, causing the effect to be less than calculated here (CH2MHILL 2006a).

4.3.1.4 Impacts to Groundwater Quality

Based on available groundwater data, groundwater quality from all three aquifers (alluvial, volcanic and carbonate) in the Kane Springs Valley is relatively good. The additional pumping under the Proposed Action would occur from the carbonate aquifer that is located at great depths with respect to the overlying volcanic and alluvial aquifers. Proposed groundwater pumping is not expected to deteriorate water quality from the mixing of waters from the various aquifers under the Proposed Action.

4.3.1.5 Impacts to Springs

Based on previous isotope studies conducted in the region, local springs in the Kane Springs Valley Hydrographic Basin are recharged by local precipitation and derive their water from localized groundwater flowing through the surrounding upland areas such as the Delamar Mountains and Meadow Valley Mountains (CH2MHILL 2006a, 2006b). Because these springs are not connected to the regional carbonate aquifer where the proposed pumping would occur, no impacts to local springs from groundwater withdrawals are anticipated under the Proposed Action.

Potential impacts to regionally significant springs were evaluated by reviewing the hydraulic data, water chemistry and published geologic interpretations of the hydrologic conditions in the lower portion of the White River Flow System. The potential effects of pumping on discharges from Muddy Springs were included in this evaluation primarily due to the high permeability and transmissivity of the carbonate aquifer underlying Kane Springs Valley and downgradient Coyote Spring Valley, which could connect the Proposed Action and the springs. Areas of high transmissivity, such as observed in Kane Springs Valley, generally develop a smaller drawdown cone. Long-term effects from groundwater extraction could, however, be propagated over great distances. Barriers to flow, such as faults or rock units with low permeability, also affect the extent of the drawdown.

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 impede the propagation of the cone of depression migrating south towards the Muddy Springs area. Until additional long-term pumping data are obtained in the area, the true range of influence can not be fully evaluated.

As described in Section 3.3 - Groundwater Resources, based on recent isotope data, regional springs appear to contain varying proportions of regional carbonate groundwater and a younger, non-carbonate water. Estimated percentages of regional carbonate groundwater indicate that the percentage of recharge water increases with distance downgradient from Pahranagat Valley. Muddy Springs are estimated to be composed of 60 percent regional carbonate groundwater and 40 percent water of non-carbonate origin, while Rogers Spring and Blue Point Spring, located further downgradient near Lake Mead, are estimated to contain 60 percent recharge and only about 40 percent regional carbonate groundwater (see **Table 3-4**). This implies that groundwater in the regional aquifer is being continuously recharged by local sources along its flow path. The Office of the Nevada State Engineer (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 by various state and federal agencies.

Based on the above discussion, the BLM does not anticipate noticable impacts to Muddy Springs related to groundwater pumping under the Proposed Action; however, the potential to affect the discharge rates at Muddy Springs does exist. The Stipulation Agreement between the LCWD and the USFWS, described in Section 1.4.2 and provided in **Appendix A**, outlines protection measures designed to protect aquatic resources within the Muddy River area. Impacts to flow rates in the Muddy River Springs area would be mitigated by reduction or cessation of pumping activities in the Kane Springs Valley if the water discharges in the Warm Springs area drops below 3.0 cfs.

No impacts to water levels within the upgradient Pahranagat and Delamar Valleys or within the Meadow Valley Wash Hydrographic Basin located to the east are anticipated. Water levels in Pahranagat and Delamar Valleys are controlled by the partial barrier created by the Pahranagat Shear Zone, and groundwater in the Meadow Valley Wash Hydrographic Basin is a part of a separate regional flow system.

4.3.1.6 Impacts to Local Water Users

Upon review of the Nevada State Engineer water rights database, no groundwater right applications within the Kane Springs Valley Hydrographic Basin, other than those filed by the LCWD were identified. Low-yield domestic wells are exempt from state water right permitting requirements; however, they do require a drilling permit. The search of the Nevada State Engineer well log database returned records for only three wells – the LCWD KMW-1/KPW-1 wells and a stock water well installed by Geyser Ranch in 1968.

Geologic observations during the installation of KPW-1 do not show a completely impermeable confining layer within the geologic column. However, the data indicate that most of the flow may occur within a narrow band of fractured material at a depth of approximately 1,350 feet below the surface. Thus, the amount of connection between the deep carbonate aquifer and any surficial aquifer is unknown at this time. Based on data evaluated to date, no effect from pumping on shallow water wells is anticipated under the Proposed Action.

In the Coyote Spring Valley Hydrographic Basin, no groundwater rights have been identified within 1 mile of the Proposed Action. Therefore, no wells would experience lowered water levels of 4 to 30 feet (**Table 4-1**) as predicted by the drawdown analysis provided in Section 4.3.1.3. Groundwater wells located within 10 miles of the Proposed Action include SNWA industrial wells, CSI municipal wells and Bedrock Limited, LLC wells associated with mining operations. Based on the drawdown analysis provided in Section 4.3.1.3., these wells could experience lowered groundwater levels by 2 to 3 feet for an extraction rate of 1,000

AFY, while at an extraction rate of 5,000 AFY, the drawdown may increase to between 11 and 20 feet (**Table 4-1**).

4.3.2 Alternative 1

Impacts to surface water and groundwater resources under this alternative would be the same as those anticipated under the Proposed Action.

4.3.3 No Action Alternative

Under the No Action Alternative, the ROW on federal lands would not be granted. No ground disturbance associated with the Proposed Action or Alternative 1 would occur, and no associated facilities would be constructed on BLM-administered public lands. No project-related impacts to water resources would occur under this alternative.

4.3.4 Mitigation

It is not anticipated that the Proposed Action would result in noticeable adverse impacts to discharges at Muddy Springs; nevertheless, several rulings by the Nevada State Engineer and agreements were drafted to protect the flows at Muddy River Springs. These rulings are presented in **Appendix A** and include:

- Nevada State Engineer Order 1169 (described in Section 4.20.3.3.5) which relates to groundwater applications in several adjacent groundwater basins, including Coyote Spring Valley, and holds various permits in abeyance pending the completion of a study of the regional carbonate aquifer system. Order 1169 requires major groundwater rights holders in the Coyote Spring Valley Hydrographic Basin to participate in a 5-year study to provide information on the effects of pumping existing permitted water rights in Coyote Spring Valley. These right holders include the Las Vegas Valley Water District, SNWA, CSI, Nevada Power Company, and the Moapa Valley Water District. Signatory agencies for Order 1169 include the BLM, Bureau of Indian Affairs, the USFWS and the NPS.
- Stipulation Agreement between the LCWD and the USFWS (described in Section 1.4.2); Parties agree to cooperatively manage the development of the LCWD water rights in the Kane Springs Valley Hydrographic Basin including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached.
- Memorandum of Understanding (as described in Section 4.20.4.2) agreement between the SNWA, CSI, Moapa Valley Water District, and the USFWS requires the reduction or cessation of pumping if specified spring flow trigger levels are reached.

The BLM will continue to coordinate with the LCWD, major groundwater rights holders and other agencies in the region to ensure that groundwater development would not adversely impact the flows at Muddy River.

A series of monitoring wells would be utilized to monitor potential impacts to local water users related to increased depth to groundwater from proposed pumping. Even though no impacts on shallow water users are anticipated, water levels in the shallow aquifers would also be monitored to better document the degree of hydraulic connection or isolation from the deep carbonate aquifer.

Studies suggest that the local springs in the Kane Springs Valley are not connected to the regional carbonate aquifer but rather are recharged by local precipitation. However, the LCWD will place appropriate monitoring devices in any free-flowing springs in the Kane Springs Valley to confirm that no impacts to local springs would result from the Proposed Action.

Additionally, the BLM would obtain and review all monitoring flow data collected from the Muddy River Springs as identified in the Stipulation Agreement between the LCWD and the USFWS. The BLM would work collaboratively with other state and federal agencies to ensure that all potential impacts associated with the Proposed Action would be appropriately mitigated.

4.4 VEGETATION RESOURCES

4.4.1 Proposed Action

Construction of project facilities would result in impacts to Mojave Creosote Bush Scrub and Mojave Desert Wash Scrub vegetation communities within the granted ROW. These impacts would include removal of vegetation resulting from grading and compaction of soils. All construction would occur within a 100- to 150-foot wide construction easement, which would result in approximately 25 acres of permanent disturbance and approximately 195 acres of temporary disturbance.

Any disturbance of existing vegetation would increase potential for invasive plant species and noxious weeds to become established within the project area, which would facilitate their spread into adjacent undisturbed areas. In addition, dust generated during construction activities in areas adjacent to or downwind from dust sources may temporarily reduce plant photosynthesis and water use efficiency for the affected plants (Sharifi et al. 1997). The construction phase of this project would last 3 to 6 months, so these habitats would not experience any long-term declines in productivity. Phases 2 and 3 would last 1 to 2 months each.

Vegetation in the project area is shrub-dominated, and these communities can take up to several decades to fully redevelop following disturbance. Consequently, the composition and diversity of vegetation that becomes established following completion of the project would differ from the existing vegetation for up to several decades. Grasses and forbs would likely dominate the vegetation community on reclaimed and disturbed areas for at least several years. The increase of invasive species, particularly of non-native grasses, would increase the susceptibility of these areas to wildland fires.

Reclamation of disturbed areas would begin immediately following construction. Reclamation would consist of reestablishing existing contours, planting approved desert scrub species, and monitoring the success of revegetation. Success criteria, rehabilitation standards and monitoring timeframes would also be developed by the BLM. These protocols are outlined in the Revegetation Plan prepared by the LCWD. Specific Applicant-Proposed Environmental Protection Measures are outlined in **Appendix C** - Standard Construction and Operation Procedures (Reference Numbers LP-1, ESC-1, PUCC-2, BR-5, BR-7, BR-9, BR-10, BR-14, BR-17, BR-19, BR-21, BR-22, R-1, R-2, R-3, R-4, R-5, R-6, R-7, R-8, R-9, R-10, R-13 and R-15).

The objectives of the Revegetation Plan include:

- Control erosion and sedimentation.
- Provide a self-perpetuating, drought-tolerant vegetative cover that is compatible with post-construction land use.
- Use adapted native species for revegetation that are beneficial to wildlife and that would reduce the visual effect of the ROW and other project components.
- Encourage native plant reinvasion by avoiding the use of highly competitive introduced species.
- Limit the introduction and spread of noxious and other annual weeds through prompt revegetation.
- Return disturbed land to a level of productivity comparable to pre-construction levels.
- Reestablish desert tortoise critical habitat.

Operation and maintenance of the Proposed Action would not result in impacts to vegetation resources. Operation of the project involves phased withdrawals of groundwater from the carbonate aquifer and occasional maintainance activities at the well heads and along the transmission line on established access roads. As described in Section 4.3.1.1 - Impacts to Surface Water and Section 4.3.1.5 - Impacts to Springs, no impacts to surface water or springs related to groundwater pumping would result; therefore, no impacts to vegetation resources are anticipated. Additionally, operation and maintance activities would occur on disturbed acreage that was accounted for under construction activities and no additional vegetation would be impacted.

The Proposed Action may have long-term beneficial effects on vegetation communities in the project area with the development of a reliable water supply and access point. The proposed fire hydrant to be installed adjacent to the 50,000-gallon forebay tank would improve the ability of firefighters to respond to wildland fires, thus potentially resulting in fewer acres of native vegetation burning in the event of a fire. However, it is also possible that the frequency of human-caused ignitions and wildland fires in this area will increase due to increased human presence on the landscape.

Impacts to vegetation resources from implementation of the Proposed Action would be avoided or minimized by implementing the Standard Construction and Operation Procedures set out in **Appendix C** - Standard Construction and Operation Procedures. These Applicant Proposed Environmental Protection Measures and those referenced in Section 2.1.4, would be applied under all three phases of the Proposed Action and Alternative 1 and would be sufficient to avoid or minimize impacts of the build out condition upon vegetation.

4.4.1.1 Non-native Invasive Species and Noxious Weeds

Disturbed areas created by implementation of the Proposed Action would be more susceptible to infestation by invasive and noxious weed species, such as red brome, cheatgrass, Sahara mustard and others that are present in surrounding shrubland communities. Invasive and noxious weed invasion would hinder establishment of desirable vegetation. Additionally, any new areas of invasive or noxious weed occurrence within the granted ROW may act as a source for invasion of adjacent areas. Non-native annual grass species respond poorly to treatment programs, so proper management of disturbed soil is the best method of control. Invasive and noxious weed species are most likely to establish and spread along roadways and other disturbed areas that act as corridors for the transport of weed seeds. Invasive and noxious weeds also decrease habitat suitability for wildlife species because they provide little forage value for native wildlife. Additionally, invasive and noxious weeds species often out-compete native species and decrease habitat suitability for federally listed and sensitive plant and animal species (Whitson 2000). An increase in the fine, flashy fuels associated with several of the non-native invasive weed species found in the project area (red brome, cheatgrass, Mediterranean grass) could also alter the fire regime in the area.

A Risk Assessment for Noxious and Invasive Weeds was completed for this project and is included in **Appenix E-5**. A site-specific weed inventory would be completed prior to construction of this project to identify noxious weed and invasive species infestations to enable avoidance during construction or pre-treatment of these areas during construction and to reduce or eliminate the spread of these species. Specific environmental protection measures included as part of the Proposed Action are outlined in **Appendix C** - Standard Construction and Operation Procedures (Reference Number BR-22).

4.4.1.2 Federally Threatened, Endangered and Candidate Plant Species

There are no potential habitats for federally listed plant species within the Proposed Action ROW or the ROI. Therefore, construction, operation and maintenance of the Proposed Action would have no effect on any federally listed plant species.

4.4.1.3 Special Status Plant Species

The BLM identified 21 sensitive plants as potentially occurring within the project area (**Table 3-9**). The project area contains suitable habitat for three species - white bearpoppy, Meadow Valley sandwort and Las Vegas buckwheat. No individuals of these three species or of any other special status plant species were located during complete surveys within and immediately adjacent to the project area (ARCADIS 2006a). Consequently, there would be no impacts to special status plant species during construction, operation and maintenance of the Proposed Action.

All species of cactus and yucca that are native to the State of Nevada are protected and regulated (NRS 527.060-120). Surveys conducted during spring and fall of 2006 identified nine protected species of cactus and yucca in and adjacent to the Proposed Action ROW (ARCADIS 2006a). Construction activities would result in the removal of cactus within the permitted ROW. Salvage and restoration of cactus and yucca would be implemented as part of the Proposed Action and are described in the Applicant's Reclamation Plan.

As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater to the LCWD service territory in Coyote Spring Valley. Full build out of the Proposed Action, under Phases 2 and 3, would maximize delivery of up to 5,000 AFY to the LWCD service territory. Phasing of the project would not generate additional impacts on vegetation resources; water resource impacts to Phases 1, 2 and 3 are analyzed in this EIS.

4.4.2 Alternative 1

Under Alternative 1, the 138 kV transmission line and buried fiber optic line would be located within the designated LCCRDA utility corridor between Highway 93 and the Emrys Jones Substation. Installation of the overhead power lines and buried communication line would require clearing and grading of the alignment through undisturbed desert land. All construction would occur within a 100-foot wide construction easement, which would result in the temporary disturbance of up to an additional 32 acres of undisturbed desert lands. Disturbed areas would be reclaimed to pre-construction conditions following the end of construction activities except for the access road and pole footprints. However, the disturbance area would be more susceptible to the introduction and spread of invasive species and noxious weeds. Additionally, the creation of a new access road may increase the likelihood of OHV traffic, which could lead to the spread of invasive species and noxious weeds.

Routine maintenance activities may require cross-country travel along the reclaimed area. Motorized travel would be limited to the permanent access road (approximately 5 acres). These activities would increase the potential spread of invasive species and noxious weeds.

4.4.3 No Action Alternative

Under the No Action Alternative, the ROW would not be granted. No disturbance of federally managed lands associated with the Proposed Project or Alternative 1 would occur as a result of this project.

4.4.4 Mitigation

No additional mitigation is required.

4.5 WILDLIFE RESOURCES

4.5.1 Proposed Action

Impacts to wildlife resources, including Threatened, Endangered and Candidate species, result from ground disturbance caused by construction-related activities. Ground disturbance can impact wildlife habitat by removing vegetation, altering plant composition or structure, or altering soil characteristics. Loss of vegetative cover would adversely affect wildlife species that depend on that vegetation for food or shelter.

Activities that could result in additional effects on wildlife during construction include degradation of soil due to fuel contamination, harassment from human presence, and increased levels of noise and vibration due to construction, equipment movement or blasting. An additional impact could result from the increased perching opportunities for raptors and ravens, which would lead to increased predation within the project area. Long-term impacts can occur in the forms of loss of vegetation and wildlife habitat resulting from continued disturbance due to operation and maintenance activities. Approximately 195 acres of habitat would be temporarily disturbed, and 25 acres of habitat would be permanently removed in order to construct access roads and other facilities. Wildlife species could also be temporarily displaced from areas of human activity during operation and maintenance activities. Environmental protection measures proposed by the LCWD, LCPD and the LCT as part of the Proposed Action to reduce these impacts are listed in **Appendix C** (Reference Numbers LP-1, LP-2, LP-3, PUCC-1, BR-5, BR-9, BR-11, BR-12, BR-13, BR-14, BR-15, BR-16, BR-17, BR-18, BR-19, BR-20, BR-21 and BR-23).

Potential for wildland fire ignition will increase as a result of the increased presence of humans and vehicles in the project area. However, the proposed fire hydrant to be installed adjacent to the 50,000-gallon forebay tank would improve the capabilities of emergency responders in wildland fire situations, potentially resulting in fewer acres of wildlife habitat being burned in the event of a fire.

The Proposed Action ROW parallels an existing disturbance corridor (Kane Springs Road), thereby reducing the amount of existing wildlife habitat that would be affected. The large expanses of undisturbed habitat surrounding the ROW provide adequate refuge for large mammal species in the area. Additionally, all construction within the permitted ROW would occur in phases, allowing adequate time and space for large mammals to move freely throughout the area.

Minimal impacts may occur to small mammals as a result of the Proposed Action. These impacts include direct mortality or injury from crushing by construction equipment and from being trapped in burrows during project construction. Impacts to reptile species in the project area would be similar to those described for small mammals. Overall, the impacts to small mammals and reptiles would be limited to permanent removal of habitats that would result from project construction.

Operation and maintenance of the Proposed Action involves phased withdrawals of groundwater from the carbonate aquifer. However, as described in Section 4.3.1.1 - Impacts to Surface Water and Section 4.3.1.5 - Impacts to Springs, no impacts to surface water or spring discharges related to groundwater pumping would result; therefore, no water-related impacts to wildlife resources are anticipated.

4.5.1.1 Federally Threatened, Endangered and Candidate Wildlife Species

4.5.1.1.1 Desert Tortoise

The desert tortoise is the only federally listed species that may occur within the Proposed Action ROW. Construction and operation of the Proposed Action have the potential to impact desert tortoise and its habitat. Using data from desert tortoise strip-transect surveys conducted during the fall of 2006, biologists estimated a density of 0 to 26 desert tortoises per square mile in the project area. Based on the acreage of temporary disturbance to desert tortoise habitat, construction of the Proposed Action may result in the take of between 0 and 8 tortoises.

Desert tortoises may be subject to direct mortality or injury from crushing by construction equipment, being trapped in burrows during initial site grading, vehicle strikes, or falling into open trenches during construction. The magnitude of impacts would depend on conditions such as the type and duration of the disturbance, time of year and density of tortoises within and adjacent to the affected area. Environmental protection measures designed to reduce impacts to desert tortoises include imposing a project personnel speed limit, designing trenches and open pits with sloped sides for escape, and conducting a desert tortoise clearance survey prior to construction activities to remove tortoises from the ROW.

As shown in **Table 4-2**, approximately 25 acres of desert tortoise habitat would be permanently disturbed by construction of the Proposed Action. Approximately 195 acres of desert tortoise habitat 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 of desert tortoise habitat would occur in the Mormon Mesa Critical Habitat Unit. Permanent and temporary disturbance make 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 Road ROW. Approximately 147.2 acres of desert tortoise critical habitat on federal land would be disturbed.

Other potential effects to desert tortoise from construction activities include degradation of soil due to fuel contamination, harassment from human presence, increased levels of noise and vibration due to construction equipment movement or blasting, loss of cover due to crushing or removal of vegetation, and loss of forage due to changed vegetation composition. Increased predation of desert tortoise from ravens and other species could potentially occur as a result of predators being attracted to the area by the garbage accumulation associated with human presence; however, construction crews would be required to remove refuse daily. The overhead transmission lines may also provide new perching opportunities for predators, which could lead to increased predation; however, anti-perching devices installed as part of the Proposed Action would help to minimize these impacts.

Table 4-2
Desert Tortoise Habitat Disturbed by the Proposed Action

Land Category	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	28
Project Total Disturbance	25	195

Potential for wildland fire ignition would increase as a result of the increased presence of humans and vehicles in the project area. However, the proposed fire hydrant to be constructed adjacent to the 50,000-gallon forebay tank would improve the firefighting capabilities of emergency responders in wildland fire situations, potentially resulting in fewer acres of desert tortoise habitat being burned in the event of a fire.

In consultation with the USFWS and the BLM biologists, the LCWD, LCPD and the LCT and their contractors would incorporate desert tortoise protection measures to reduce the potential for effects associated with the Proposed Action. These Applicant Proposed Environmental Protection Measures are listed in **Appendix C** (Reference Numbers LP-1, LP-2, LP-3, PUCC-1,

BR-5, BR-9, BR-11, BR-12, BR-14, BR-16, BR-18, BR-19, BR-20, BR-21 and BR-23). Additional mitigation measures may be required by the USFWS through Section 7 or Section 10 consultation.

Habitat restoration would be conducted for all federal lands disturbed by construction of the Proposed Action with the exception of about 25 acres (public and private) that would be permanently impacted by the project footprint. Additional measures to minimize or mitigate incidental take of desert tortoise will be determined through consultation with the U.S. Fish and Wildlife Service through Section 7 or Section 10, as appropriate. Restoration on private or leased lands held by CSI would be consistent with the standards that would be implemented upon approval of the CSI MSHCP. The Coyote Spring - Lincoln County General Improvement District Service Plan describes potential impacts to Endangered and Threatened species within the GID service territory. The GID would require mitigation for any adverse impacts to habitat as a result of the Proposed Action, and initial funds for mitigation would come from a land disturbance fee assessed at the time of construction permitting.

Prior to issuance of any federal permit, lease or authorization for any surface-disturbing activity on public lands, the LCWD and the other utility agencies would be required to pay a remuneration fee for each acre of disturbed desert tortoise habitat. The amount of the fee would be calculated by the USFWS and would be used to fund conservation measures benefiting the desert tortoise.

Implementation of the Proposed Action "may affect, is likely to adversely affect" the desert tortoise in the project area. During Section 7 consultation, the USFWS will evaluate the data to determine if the Proposed Action will jeopardize the continued existence of the desert tortoise. The project is anticipated to directly affect habitats within the Mormon Mesa Critical Habitat Unit. However, 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 primarily be affected during the construction phase of the project.

4.5.1.1.2 Moapa Dace

There is no habitat for Moapa dace within the project area. Within the ROI, there is habitat for this species in the Muddy River system, and impacts could occur to suitable habitat for the Moapa dace. This species has been documented in the Muddy Springs area, approximately 28 miles south of the project area.

Groundwater pumping associated with the Proposed Action would have the potential to impact flow rates in the Muddy River system. As a result, the LCWD and the USFWS have agreed to cooperatively monitor pumping of the LCWD water rights in the Kane Springs Valley Hydrographic Basin to avoid impairment of senior federal water rights or unreasonable adverse impacts to federal water resources. 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 A**) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached.

The BLM will continue to coordinate with the LCWD and the USFWS to ensure that the Proposed Action would not adversely impact the Muddy River system.

While the Stipulation 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 to the Moapa dace 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, the 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.

Implementation of the Proposed Action "may affect, is likely to adversely affect" the Moapa dace downstream of the project area in the Muddy River. During Section 7 consultation, the USFWS will evaluate the data to determine if the proposed project will jeopardize the continued existence of the Moapa dace. The project is not anticipated to directly affect Moapa dace habitat; however, indirect effects due to groundwater pumping may occur within Moapa dace habitat.

4.5.1.1.3 Southwestern Willow Flycatcher

There is no habitat for the southwestern willow flycatcher within the project area. Within the ROI, this species has been documented in riparian habitat in the Muddy Springs area, approximately 28 miles south of the project area. This riparian habitat is supported by surface water flow from springs, along stream reaches and in the shallow alluvial aquifer.

Groundwater pumping associated with the Proposed Action would have the potential to impact flow rates in the Muddy River system. As described in Section 4.5.1.1.2 Moapa Dace, "trigger points" have been established that serve to minimize adverse impacts to the Moapa dace (and consequently, other riparian habitat including southwestern willow flycatcher habitat) (**Appendix A**) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. The BLM will continue to coordinate with the LCWD and the 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.

It is not anticipated that groundwater pumping in the Kane Springs Valley Hydrographic Basin will reduce flows in the Muddy River Springs area to the point that riparian vegetation would be impacted. 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 Stipulation Agreement, the BLM believes that implementation of the Proposed Action "may affect, not likely to adversely affect" the southwestern willow flycatcher. Any potential impacts to this species and its habitat would be mitigated according to the Stipulation Agreement.

4.5.1.1.4 Yellow-billed Cuckoo

There is no habitat for the western yellow-billed cuckoo within the project area. Within the ROI, this species has been documented in riparian habitat in the Muddy Springs area, approximately 28 miles south of the project area. This riparian habitat is supported by surface water flow from springs, along stream reaches and in the shallow alluvial aquifer.

Groundwater pumping associated with the Proposed Action would have the potential to impact flow rates in the Muddy River system. As described in Section 4.5.1.1.2 Moapa Dace, "trigger points" have been established that serve to minimize adverse impacts to the Moapa dace (and consequently, other riparian habitat including yellow-billed cuckoo habitat) (**Appendix A**) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. The 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 yellow-billed cuckoo habitat.

It is not anticipated that groundwater pumping in the Kane Springs Valley Hydrographic Basin will reduce flows in the Muddy River Springs area to the point that riparian vegetation would be impacted. 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 Stipulation Agreement, the BLM believes that implementation of the Proposed Action "would not contribute to the need to list" the yellow-billed cuckoo. Any potential impacts to this species and its habitat would be mitigated according to the Stipulation Agreement.

4.5.1.2 Special Status Wildlife Species

4.5.1.2.1 Mammals

Construction activities along Kane Springs Road may temporarily disrupt movement of large mammals between the Meadow Valley and Delamar Mountain Ranges. Construction activities are anticipated to be short-term. The ROW would be restored at the completion of construction, and there would be no long-term impacts (e.g., fencing of the pipeline corridor) that would restrict historic movement of wildlife among the mountain ranges. No measurable direct or indirect impacts to wildlife would occur from construction, operation and maintenance of the Proposed Action.

No maternal roost, colonial roosting habitats or winter roosts for bats are known to occur within the Proposed Action ROW. There is a potential for impacts to bats and other small mammals that could be harmed by entering substations and coming in contact with electrical systems.

4.5.1.2.2 Reptiles and Amphibians

During field surveys for desert tortoise and rare plants conducted in the spring and fall of 2006, no populations of Gila monsters or chuckwallas were found within the proposed ROW

(ARCADIS 2006a and 2006b); however, Gila monsters have historically been observed within the ROI. The project area contains suitable reptile habitat, which include deep, dissected washes along with natural cavities that may provide shelter for Gila monsters as well as boulders that may provide habitat for chuckwallas.

Potential effects to banded Gila monsters, chuckwallas and other reptiles include direct mortality or injury from vehicle strikes, crushing by construction equipment and being trapped in burrows during project construction. The magnitude of impacts would depend on conditions such as the frequency of the maintenance, time of year and density of reptiles within and adjacent to the operations. Implementation of these measures would help to reduce direct impacts to reptile species within the project area. Adherence to these environmental protection measures would limit the extent of direct impacts to reptile species. Environmental protection measures outlined in **Appendix C** (Reference numbers BR-3, BR-4, BR-9, BR-10, BR-12, BR-14, BR-15 and BR-21) would help to reduce direct impacts to reptile species within the project area. Adherence to these measures would limit the extent of direct impacts to reptile species and reduce any potential direct impacts.

Additional impacts which may affect banded Gila monsters, chuckwallas and other reptiles during construction activity include degradation of soil due to fuel contamination, harassment from human presence, increased levels of noise and vibration due to construction equipment movement or blasting, increased predation from ravens, and the potential to fall into open trenches and pits. Specific environmental protection measures for these species are included in **Appendix C** (Reference numbers BR-11, BR-16, BR-18, BR-20 and BR-23). These measures would reduce the potential for indirect impacts from raptor predation, fall and entrapment hazards, and soil contamination.

4.5.1.2.3 Migratory Birds

Most of the bird species that occur within the project area are protected by the MBTA. Impacts to birds in the vicinity of the project area include direct mortality from increased human traffic in the area; direct disturbance of nests as a result of construction, operation and maintenance activities destroying a nest; and nest abandonment as a result of construction, operation and maintenance noise. If construction of the project occurs during the breeding season, a migratory bird nesting survey would be conducted prior to construction in order to identify any active migratory bird nests. Any occupied nests would be monitored and avoided until the fledglings have left the nest. Undertaking environmental protection measures outlined in **Appendix C**, including BR-1, would limit the potential for impacts to migratory bird species by identifying, monitoring and avoiding known nests if construction occurs within the breeding season. Therefore, the MBTA would not be violated as a result of construction of the Proposed Action, and impacts to migratory birds and their nests would be avoided/minimized.

Suitable habitat for the western burrowing owl occurs throughout the project area. During field surveys conducted in the spring and fall of 2006, one burrowing owl was found in the project area (ARCADIS 2006b). The project area would be surveyed for burrowing owl nesting cavities prior to the nesting season and during construction if ground-disturbing activities are scheduled between mid-March and August. Assuming burrows are not desert tortoise burrows, empty nest site burrows could be collapsed within the construction zone so that owls would not enter the ROW during construction and set up a nest. Before collapsing the burrows, they would be inspected to prevent the trapping of desert tortoises, Gila monsters and other wildlife species. If empty nest site burrows that are desert tortoise burrows are identified, prior authorization from the USFWS through a Section 7 take statement or a Section 10 take permit would need to be obtained before collapsing these burrows.

Any occupied burrows would be surrounded by a 250-foot buffer zone, within which no construction activities would occur, to prevent nest abandonment. The nesting cycle for burrowing owls takes 74 days, so construction activities would cease in the area until after this allotted time has passed or until a qualified biologist confirmed that nesting was completed. This would mitigate direct impacts that may otherwise occur to burrowing owls. This would be accomplished, where appropriate, as part of the surveys for the desert tortoise. If owl-occupied burrows are located during their nesting or brooding season, they would be avoided until the young owls leave the nest or it is determined that the nesting attempt failed.

Direct effects to the burrowing owl may include the destruction of nest burrows or other occupied satellite burrows, direct mortality or injury from crushing by construction equipment, and from being trapped in burrows during project construction. Undertaking environmental protection measures outlined in **Appendix C** (Reference number BR-1) would limit the potential for impacts to migratory bird species by identifying, monitoring and avoiding known nests if construction occurs within the breeding season. Therefore, the MBTA would not be violated as a result of constructing the Proposed Action, and impacts to migratory birds and their nests would be reduced to less than significant levels.

Additional impacts to the western burrowing owl may occur as a result of degradation to soil due to fuel contamination, harassment and potential nest abandonment from human presence; increased levels of noise and vibration due to construction equipment movement or blasting; and loss of prey base as a result of direct mortality of small mammals and reptiles.

It is not anticipated that operation and maintenance activities associated with the Proposed Action would have any impacts on western burrowing owls because measures described above and listed in **Appendix C** would be implemented.

There is no riparian habitat within the project area. Riparian bird species, including blue grosbeak (*Guiraca caerulea*), summer tanager (*Piranga rubra*), vermilion flycatcher (*Pyrocephalus rubinus*), and others, are known to occur in the Muddy Springs area, approximately 28 miles south of the project area. As described previously, any potential impacts to surface water flows in the Muddy River system would be minimized through the Stipulation Agreement between the LCWD and the USFWS.

Raptors and other large aerial perching birds are most susceptible to electrocution when coming in contact with power line structures because of their size, distribution and behavior (Olendorff et al. 1981; APLIC 1996). Because raptors and other large aerial perching birds often perch on tall structures that offer optimal views of potential prey, the design characteristics of transmission poles appear to be a major factor in raptor electrocutions (APLIC 1996). Electrocution occurs only when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission pole with insufficient clearance between these elements. 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.

There would also be an increased potential for collisions with transmission lines and poles. If bird collisions become an issue with the new transmission line, strike indicators (visual markers for birds) could be installed to help reduce impacts (as recommended by APLIC [1994]; Avery et al. [1978]; Brown [1973]).

4.5.1.2.4 Fisheries

There is no fish habitat within the project area. Within the ROI, suitable habitat for sensitive fish species occurs within the Muddy River system. The Virgin River chub and Moapa speckled dace are known to occur in the Muddy Springs or Muddy River areas, approximately 28 miles south of the project area. As described in Section 4.3.1.5 - Impacts to Springs, no impacts to discharges at Muddy Springs are anticipated. While no impacts to discharges are anticipated, groundwater pumping associated with the Proposed Action would have the potential to impact flow rates in the Muddy River system. As a result, the LCWD and the USFWS have agreed to cooperatively monitor pumping of the LCWD water rights in the Kane Springs Valley Hydrographic Basin to avoid impairment of senior federal water rights or unreasonable adverse impacts to federal water resources. 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 fish species) (**Appendix A**) including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached. The BLM will continue to coordinate with the LCWD and the USFWS to ensure that the Proposed Action would not adversely impact the Muddy River system.

While the Stipulation Agreement is designed to minimize adverse impacts to the Moapa dace, any decrease in flows may adversely impact the Virgin River chub and Moapa speckled 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 these species; however, 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.

There would be no direct or indirect impacts to the BLM sensitive or state protected fish species related to construction, operation and maintenance activities within the immediate project area.

4.5.1.2.5 Invertebrates

The grated tryonia and Moapa Warm Spring riffle beetle are known to occur in the Warm Springs area near the Muddy River. Impacts to sensitive invertebrate species in the Muddy River system could occur as a result of surface water drawdown resulting from groundwater pumping; however, the Monitoring, Management, and Mitigation Plan in the Stipulation Agreement (**Appendix A**) would mitigate potential effects to the Muddy River system. This would most likely eliminate any potential impacts to sensitive invertebrate species and their habitat in the Muddy River system. There would be no direct or indirect impacts to the BLM sensitive or state categorized invertebrate species related to construction, operation and maintenance activities within the immediate project area.

4.5.2 Alternative 1

Under Alternative 1, the 138 kV transmission line and buried fiber optic line would be located within the designated LCCRDA utility corridor between Highway 93 and the Emrys Jones Substation. Installation of the overhead power lines and buried communication line would require clearing and grading of the alignment through undisturbed desert land. All construction would occur within a 100-foot wide construction easement, which would result in the temporary disturbance of up to 32 acres of undisturbed desert lands. Disturbed areas would be reclaimed to pre-construction conditions following the end of construction activities except for the access road and pole footprints.

Disturbance to desert tortoise habitat under Alternative 1 would be slightly greater than that under the Proposed Action. Approximately 30.2 acres (5.2 acres more than the Proposed Action) of desert tortoise habitat would be permanently disturbed by construction of Alternative 1. 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 would make 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 Road ROW. Approximately 147.2 acres of critical habitat on federal land would be disturbed. As described for the Proposed Action, the environmental protection measures that would be implemented as part of this Alternative would reduce potential direct impacts to fish and wildlife species.

Increased predation from raptors as a result of increased perching opportunities created by development of a transmission line away from the road would constitute an indirect impact associated with Alternative 1. This indirect impact would be minimized with the adoption and implementation of Reference Measure BR-18 (Appendix C). Additionally, the creation of a new access road may increase the likelihood of OHV traffic, which could facilitate the spread of invasive species of plants, noxious weeds and the chances of collisions with wildlife.

Because the location and volume of groundwater pumping under the Alternative 1 would be the same as that for the Proposed Action, potential indirect effects to federally listed and other species of concern in the Muddy Springs area would be the same as those described for the Proposed Action. As described for the Proposed Action, conservation measures developed for the Moapa dace would reduce potential indirect impacts from groundwater pumping to federally listed and other special status species.

4.5.3 No Action Alternative

Under the No Action Alternative, the BLM would not grant ROWs allowing construction and operation of the Proposed Action or Alternative 1, and the impacts described above would not occur as a result of this project. The No Action Alternative would not affect the biological viability of local, regional or national populations of wildlife species of concern/interest. The No Action Alternative would have no impact on Endangered, Threatened, Candidate and other sensitive species.

4.5.4 Mitigation

No additional mitigation is required; however, additional mitigation measures may be required by the USFWS through Section 7 or Section 10 consultation.

4.6 LAND USE

4.6.1 Proposed Action

Construction of the Proposed Action would require approximately 195 acres (167 acres public; 28 acres private). Following construction, approximately 25 acres (17 acres public; 8 acres private) would be maintained as permanent ROW and aboveground facilities. The remaining acreage would be restored and allowed to revert to former use. Most of the ROW would parallel Kane Springs Road within the designated LCCRDA utility corridor. While land ownership would remain unchanged, grazing and public use (including access to the surrounding Wildernesses) and use of Kane Springs Road may be disrupted for short durations during construction.

The 138 kV transmission line, Emrys Jones Substation, terminal storage tank and portions of the fiber optic lines would be located on private or leased lands in northern Coyote Spring Valley. Land use plans have been adopted, ordinances enacted and agreements have been signed between Lincoln County and CSI for development of these lands. These documents include:

- Coyote Spring Development Agreement (June 9, 2005)
- Coyote Spring Planned Unit Development (Lincoln County Ordinance 2004-04) (July 1, 2005)
- Lincoln County–Coyote Spring GID Service Plan (May 4, 2005)
- Coyote Spring Fire Protection and Emergency Medical Service GID Service Plan for Lands Located within Lincoln County (May 3, 2005).

Indirect impacts of the Proposed Action would include conversion of undeveloped desert land to utility-related uses. Title III of the LCCRDA designated utility corridors on the BLM lands to encourage consolidation of utilities within a common corridor. The LCWD intends to use the LCCRDA corridor as a means to convey groundwater to the Coyote Spring Valley within the LCWD service territory. During Phase 1, up to 1,000 AFY would be conveyed to the LCWD service territory. During Phases 2 and 3, and depending on additional water demands and acquisition of additional water rights, up to 5,000 AFY may be conveyed to the LCWD service territory. The affects of conveyance of 1,000 AFY of groundwater on land use would be the same as those for conveyance of 5,000 AFY of groundwater.

Operation and maintenance of the Proposed Action would not conflict with existing federal, state or county land use plans, policies or regulations applicable to the project area. All future land use changes associated with urban growth in the Coyote Spring Valley area would be required to comply with Clark County, Lincoln County and Coyote Spring GID land use plans and development requirements. Land use on federal lands would continue to be managed under the Caliente MFP (as amended) until the RMP/EIS for the Ely District is approved. The USFWS would continue to coordinate with the BLM, Lincoln County and CSI to protect wildlife and their habitats in the area.

4.6.1.1 Mineral Resources

There are no active mining claims or oil and gas leases within the project area. The Proposed Action would not affect access to, or availability or development of, oil and gas or any locatable/saleable mineral resources in the project area. Western Elite, Inc. operates a sand and gravel operation on private lands west of the intersection of Kane Springs Road and Highway 93. If sand and gravel are needed during the construction and operation of the Proposed Action, Western Elite would most likely provide those materials.

4.6.1.2 Range Resources

The project area includes portions of the Grapevine and Delamar grazing allotments. Both allotments were affected by wildland fires in 2005. Currently, 45 percent of the burn area in the Delamar Allotment is temporarily closed to livestock grazing (Johnson 2006). A portion of the Grapevine Allotment is also under review for temporary closures due to the 2005 fires (Johnson 2006). The proposed pipelines would be buried and would not permanently restrict movement of cattle among grazing areas.

Implementation of the Proposed Action, and the resultant groundwater pumping activities, would not cause a reduction in forage levels in the project area that would lead to a decrease in permitted AUMs in either the Delamar or Grapevine allotments.

4.6.1.3 Transportation

Highway 93 and Kane Springs Road would provide the primary access into the project area. Traffic flow in the project area could be intermittently slowed by vehicles turning from Highway 93 onto Kane Springs Road. Traffic volumes would vary as construction progresses from one area to another. These impacts would be short-term (3 to 4 months during construction activities) and would not change the service level of Kane Springs Road. The LCWD has prepared an Access Road Plan, which describes measures to be taken by the LCWD or its contractors to access project facilities and the ROW, reclaim temporary access roads, and prevent unauthorized vehicle use of the project ROW. It includes descriptions of access routes and standard operational procedures for transportation-related activities.

Construction activity could contribute to increased levels of dust, which is generated from travel on gravel and dirt roads. The LCWD has prepared a Dust Control Plan, which outlines dust control measures the LCWD and which its construction and reclamation contractors would implement during project construction in accordance with local regulations. The Dust Control Plan is designed to comply with the NDEP – Bureau of Air Pollution Control SAD Permit requirements.

Use of Kane Springs Road during construction would contribute to roadway deterioration in the short term and would increase maintenance costs to Lincoln County. The county would continue to maintain the roadway during and after construction of the Proposed Action.

The Proposed Action would cause no impacts to the UP Railroad, located east of the project area, or any local or municipal airports in the region.

4.6.2 Alternative 1

Under Alternative 1, the 138 kV transmission line and buried fiber optic line would be located within the designated LCCRDA utility corridor between Highway 93 and the Emrys Jones Substation. Installation of the overhead power lines and buried communication line would require clearing and grading of the alignment through undisturbed desert land. All construction would occur within a 100-foot wide construction easement, which would result in the temporary disturbance of up to 32 acres of undisturbed desert lands. With the exception of the permanent access road and electric pole footprints, all disturbed areas would be reclaimed to pre-construction conditions. Land use in this area would change from undeveloped desert to utility-related uses.

4.6.3 No Action Alternative

Under the No Action Alternative, there would be no impacts to land use on federal lands within the project area associated with the Proposed Action or Alternative 1. However, land use would continue to change on private or leased lands resulting from construction of the Emrys Jones Substation and associated transmission lines. Land use planning on these lands would be subject to Lincoln County or local GID regulations.

4.6.4 Mitigation

To restrict OHV use in unauthorized areas, restrictive barriers would be used to limit public access of new maintenance roads adjacent to the Wilderness. Barrier control methods would be coordinated with the landowner/manager and may include locked gates and fencing.

4.7 AREAS OF CRITICAL ENVIRONMENTAL CONCERN, WILDERNESS AND OTHER SPECIAL USE AREAS

The Proposed Action would be located in the Kane Springs ACEC; however, all components on federal lands would be constructed within the 2,640-foot wide LCCRDA corridor. Per the BLM Manual 8560 – Section 19, "No buffer zones are created around Wilderness areas to protect them from the influence of activities on adjacent land." As such, no project component would be located closer than 100 feet from a Wilderness boundary. Project facilities located on private lands in the Coyote Spring Valley area would be subject to the applicable land use plan (e.g., CSI MSHCP, Lincoln County Master Plan, Lincoln County – Coyote Spring General Improvement Service Area Plan).

Construction activities may temporarily restrict access roads into the surrounding Wildernesses. However, these impacts would be localized and short-term. Operation of the Proposed Action would not, in and of itself, increase recreation use in the area. Permanent project facilities would not restrict access to the surrounding Wildernesses.

4.7.1 Alternative 1

Construction activities associated with Alternative 1 would result in the disturbance of approximately 32 acres of land within the Kane Springs ACEC (assuming a 100-foot wide construction and permanent ROW). After construction, the permanent access road between Highway 93 and the Emrys Jones Substation would be maintained by the LCPD for routine maintenance activities. The permanent ROW would convert previously undisturbed desert within the Kane Springs ACEC to utility-related uses. All disturbed lands would be located within the designated LCCRDA utility corridor.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no impacts to ACECs, Wildernesses or other special use areas on federal lands within the project area associated with the Proposed Action or Alternative 1.

4.7.3 Mitigation

No mitigation is recommended.

4.8 RECREATION

4.8.1 Proposed Action

Due to its remoteness, the project area currently does not experience a high level of recreation use, although the BLM reports that usage has increased over the last several years (BLM 2006b). The surrounding Delamar Mountain and Meadow Valley Range Wildernesses support dispersed recreation activities such as hiking, sightseeing, camping, hunting and wildlife viewing. Construction activities along portions of Kane Springs Road may temporarily restrict access into these areas. Conducting OHV competitions along Kane Springs Road would continue to require a Special Recreation Permit from the BLM. The Proposed Action would not preclude the use of these areas, but rather would temporarily displace recreational users to surrounding recreation areas if access roads are restricted due to construction. Operation and maintenance of the project facilities would not limit public access to recreation opportunities in the surrounding area.

Implementation of the Proposed Action would not, in and of itself, increase recreation use in the area. Permanent project facilities would not restrict access to the surrounding Wilderness.

4.8.2 Alternative 1

Construction activities associated with Alternative 1 would convert previously undisturbed desert to utility-related uses. A permanent (dirt) road would be required between Highway 93 and the Emrys Jones Substation for routine maintenance activities. Unless restricted by some type of barrier control, such as a locked gate, fences or boulders, any new access road along this corridor could increase public accessibility, including OHV use, into a previously undisturbed area. Use and maintenance of the new access road would require coordination between the land manager (BLM) and public utility (e.g. LCWD, LCPD and LCT).

4.8.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed or operated, and the impacts described above would not occur.

4.8.4 Mitigation

No additional mitigation required.

4.9 AIR QUALITY

4.9.1 Proposed Action

Nearly all air emissions and air quality impacts associated with the Proposed Action would be temporary and would occur as the result of project construction. Construction activities can be grouped into those occurring on site and off site. Air pollutant emissions during on-site construction would principally consist of dust generated from travel on unpaved surfaces and material handling and exhaust emissions from mobile diesel and gasoline-powered construction equipment. Off-site exhaust emissions would result from the workers commuting to staging areas, transporting workers from staging areas to the work sites, trucks hauling materials to the work sites, and dump trucks hauling away construction debris.

Diesel-fired portable engines and equipment would likely provide temporary power during construction. Operation of any stationary internal combustion engine that has a rating for output greater than 250 hp would require an operating permit from the NDEP. Diesel-fired electrical generators would be subject to regulation through state and local air quality permitting programs. Permitted equipment would be required to meet applicable emission standards and control requirements.

Construction of pipelines, transmission lines and associated facilities (including new substations) would result in temporary emissions of fugitive dust containing PM_{10} and $PM_{2.5}$. These emissions would dissipate following completion of construction. Particulate matter from construction would be emitted at ambient temperature and at ground level. Fugitive dust emissions from construction activities would be minimized through common construction and BMPs, such as application of water to disturbed areas. Environmental protection measures (NA-1 through NA-10), listed in Appendix C would be used to reduce air quality impacts.

Dust would not be expected to travel great distances from the generation site. Emissions from construction activities would not likely impact measurements at ambient PM_{10} and $PM_{2.5}$ monitors located in Las Vegas and surrounding suburban areas, nor would they travel far enough to impact the Grand Canyon (nearest Class I airshed).

Temporary gaseous emissions would be generated during construction, including SO_2, CO, NO_x, and volatile organic compounds (VOCs) from diesel-powered well-drilling and construction equipment. SO_2 emissions would be limited by state and federal regulations, which limit the amount of sulfur in diesel fuel. Other gaseous emissions from diesel engines would be minimized through proper operation and maintenance. If blasting is used during pipeline construction, ammonium nitrate and fuel oil (ANFO) would be a source of gaseous pollutants. ANFO blasting can cause fugitive emissions of NO_x, CO and SO_2. Emissions from blasting agents would be limited by restricting its use to the smallest area possible. The EPA emission estimating software NONROAD2005 was used to estimate emissions from the construction equipment. **Table 4-3** presents the estimated annual construction exhaust emissions.

Table 4-3
Estimated Construction Equipment Exhaust Emissions

Phase	Equipment	Emissions per Unit (ton/year)				
		VOC	CO	NO_x	SO_2	PM
Site Preparation	Bulldozer	0.04	0.33	0.79	0.12	0.05
	5-yard Dump Truck	0.08	0.97	1.87	0.33	0.12
	Front-end Loader	0.04	0.31	0.69	0.09	0.05
	Backhoe	0.02	0.09	0.14	0.02	0.02
Site Excavation (in areas where ripping or trenching are required)	Bulldozer	0.04	0.33	0.79	0.12	0.05
	Backhoe	0.02	0.09	0.14	0.02	0.02
	Trencher	0.02	0.11	0.30	0.04	0.02
	5-Yard Dump Truck	0.08	0.97	1.87	0.33	0.12
	Jackhammer/Rock Saw	0.00	0.03	0.05	0.01	0.01
Plowing	Bulldozer	0.04	0.33	0.79	0.12	0.05
	Backhoe	0.02	0.09	0.14	0.02	0.02
	Tractor-Trailer	0.08	0.97	1.87	0.33	0.12
Backfilling, Grading, and Restoration	Bulldozer	0.04	0.33	0.79	0.12	0.05
	Backhoe	0.02	0.09	0.14	0.02	0.02
All Operations	Pick-up Trucks (4)	0.18	0.76	2.37	0.47	0.18
	Refueling Truck	0.08	0.97	1.87	0.33	0.12
	Water Truck	0.08	0.97	1.87	0.33	0.12
Total		0.88	7.74	16.48	2.82	1.14

Fugitive PM_{10} emissions were estimated using the following emission factor from EPA's AP-42 Chapter 13.2.3, Heavy Construction Operations:
Emissions = 1.2 tons/acre-month of activity
VOC – volatile organic compound; CO – carbon monoxide; NO_x – oxides of nitrogen
SO_2 – sulfur dioxide; PM – particulate matter

During construction, the PM_{10} emissions are estimated at 11.1 tons per month and 66.4 tons for the entire construction period (or for the year).

Operation and maintenance of project pipeline and power transmission facilities may generate small amounts of fugitive dust from travel on unpaved surfaces by maintenance and inspection crews as well as associated vehicle emissions. This would occur infrequently and for a very short duration.

The projected annual power needs of the Kane Springs Valley Groundwater Development Project are estimated at 2,000 MWh or .22 MW for wells pumping 1,000 AFY and 10,000 MWh or 1.1 MW for wells pumping 5,000 AFY. Assuming that all electrical energy required by the project wells was derived from a coal fired power plant (although most of the LCWD's current supply allocation is hydroelectric from Hoover Dam), the energy requirements for the project equate to the emission of an estimated 1,650 tons (at 1,000 AFY) and 8,250 tons (at 5,000 AFY) of CO_2 (a "greenhouse" gas) per year (IPCC 2007). Because CO_2 emissions are evaluated on a global scale, the direct and indirect additions of CO_2 would be added to the global total. The Intergovernmental Panel on Climate Change (IPCC) estimate CO_2 global total emissions from the land and ocean at approximately 855 billion tons per year and existing CO_2 global totals from fossil fuels at approximately 29 billions tons per year (IPCC 2007). The electrical energy demand associated with the Kane Springs Valley Groundwater Development Project could represent 1,650 to 8,250 tons of CO_2 per year, or 0.00000019 to 0.00000096 percent of the total global CO_2 emissions.

During scoping, comments were received about the potential for mobilization of radioactive dust during construction activities. The presence or absence of radioactive particulates in the soil substrate within the project area is unknown. During construction, the Applicant would implement site-specific BMPs, including dust suppression measures, to minimize fugitive dust. Applicant-proposed environmental protection measures referenced in Section 2.1.4 - Applicant Proposed Environmental Protection Measures and **Appendix C** - Standard Construction and Operation Procedures would be applied during all phases of construction.

4.9.2 Alternative 1

Impacts resulting from implementation of Alternative 1 would be similar to those described for the Proposed Action.

4.9.3 No Action Alternative

The No Action Alternative would have no air quality impacts associated with public land use.

4.9.4 Mitigation

During construction, the BLM will monitor the effectiveness of the proposed dust control measures and recommend additional air quality protection measures if deemed necessary.

4.10 NOISE

4.10.1 Proposed Action

Sound levels would be temporarily elevated by the Proposed Action's construction activities and are predicted to be below levels of concern. The EPA has established sound levels that are identified as protective of public health and welfare. The L_{dn} is the day/night sound level that was adopted by the EPA as a measure of community sound level exposure (Crocker 1982). EPA identified an L_{dn} of 55 dB for residential areas as an outdoor sound level above which the public health and welfare would be affected (EPA 1974). Noise levels from construction would be below 55 dBA at a distance of 4,000 feet from construction activities.

Long-term noise levels associated with operation of wellhead, pump station and pipeline operations would generally be steady and continuous and are predicted to be at levels lower than construction noise. Typical noise levels from field pumps and pump stations would be approximately 15 dBA (at a distance of 50 feet) lower than typical noise levels from construction. Ambient noise levels in rural areas are typically in the 35 to 40 dBA range.

Equipment used during construction activities would include standard construction and earth-moving equipment (scrapers, excavators, backhoes, graders, trenchers, bulldozers, rock drills, diesel-fired generators and dump trucks) and well development equipment such as drill rigs. Assuming that all equipment operates concurrently at the same location, the combined construction noise level would be approximately 92 dBA at a distance of 50 feet from the equipment. Standard sound level calculations predict that sound levels would decrease 6 dBA for every doubling of distance from the source. Beyond 4,000 feet from the construction, this noise level would be below 55 dBA. Additionally, the closest residential area is located well beyond 4,000 feet from the project site, and noise from construction would be intermittent and short-term.

If blasting is employed during construction, the estimated sound level at 50 feet would be 94 dBA. Noise from blasting would be an impulse (short-term peak) and would drop below 55 dBA at distances beyond 4,500 feet. Most of the sound pressure generated by blasting is absorbed by the formations being blasted (i.e., it is not like an open-air explosion). Unlike a charge placed in the ground or in rock, an open-air explosion, such as a bomb being exploded above the earth's surface, has less immediate surrounding material to absorb the sound.

There are no established guidelines or standards to predict long-term effects of elevated sound levels on wildlife. It can be assumed that any wildlife in the area have habituated to existing sound levels generated by low-flying military aircraft, vehicular traffic on Kane Springs Road and OHVs in the project area. However, wildlife may be affected by construction activity noise, causing wildlife to temporary avoid the area during construction. Nonetheless, noise form construction activities would be intermittent and short-term.

Operation of the proposed well field pumps and pump station would emit lower sound levels than those powered by diesel generators. The production wells operating on electric power would emit a sound level of approximately 77 dBA at a distance of 50 feet. For these wells, the EPA L_{dn} 55 dBA guidelines would be met at a radius of 645 feet. The closest residential area is located well beyond 645 feet from the project site. Maximum sound levels generated by transmission line corona discharge would only be perceptible in the immediate vicinity of the transmission lines. Elevated sound levels from maintenance vehicles or activities would be no higher than those predicted for the construction activities.

4.10.2 Alternative 1

Noise impacts resulting from implementation of Alternative 1 would be similar to those described for the Proposed Action.

4.10.3 No Action Alternative

Under the No Action Alternative, the ROW would not be granted on federal lands, thereby eliminating the potential for noise impacts from the Proposed Action. However, noise-generating construction activities are expected to continue on private lands.

4.10.4 Mitigation

Applicant proposed measures to reduce or minimize construction-related impacts are described in Section 2.1.4 - Applicant Proposed Environmental Protection Measures and **Appendix C** - Standard Construction and Operation Procedures. No additional mitigation beyond those implemented as part of the Proposed Action would be required.

4.11 VISUAL RESOURCES

The indicators for effects on existing scenic integrity and scenic attractiveness in the ROI are:

- Visibility from nearby Wilderness areas,
- Visibility from travel routes,
- Visibility from recreation facilities or recreational use areas, and
- Compliance with the BLM VRM objectives for facilities located on public lands administered by the Ely District.

4.11.1 Proposed Action

Direct visual effects generated by construction and operation of the Proposed Action would be experienced by viewers at sensitive viewing areas within the ROI. The only sensitive viewing area within the project area includes the portion of the Proposed Action adjacent to Highway 93, as this area is viewed by the highest number of people on a daily basis.

As described in Section 3.11.2, one KOP (located along Highway 93 near the junction of Kane Springs Road) was selected to analyze typical visual impacts imposed by the Proposed Action on the greatest number of observers. The analysis of the KOP presented in the following paragraphs concluded that, because the viewer exposure is so low, the overall visual sensitivity of the project area within the utility corridor is low as seen from the KOP or other locations along Highway 93. In general, views from the road would be from moving vehicles.

Because there are only minor human modifications in the area, construction of any additional modifications would change the character of the landscape. Views of most of the project area are blocked from the highway by intervening landforms. The duration of views towards the project area would typically be very brief, as motorists would travel beyond the area in a few minutes.

The proposed 700,000-gallon terminal water storage tank would be on private property next to the LCCRDA utility corridor, approximately 3 miles east of Highway 93. The storage tank would be approximately 24 feet tall and 61 feet in diameter. Due to the undulating topography of the local terrain, the visibility of the tank from any existing sensitive viewing area would be limited. The closest highway viewpoint that would most likely provide a view of the tank is about 0.4 mile south of Kane Springs Road. The view towards the storage tank faces east-northeast towards a flat, sparsely vegetated sandy wash. However, the wash meanders through hilly terrain, which would restrict full views of the water tank.

The proposed 138 kV transmission line would span Highway 93 to interconnect with an existing 138 kV transmission line located on the west side of highway. The wood poles of the distribution line would be in the foreground views of travelers along Highway 93. The wooden pole structures would be in the foreground views at the junction of Kane Springs Road and Highway 93 as viewed by travelers along this stretch of the highway. In addition, the lines would be visible from the private parcel west of the highway.

The Emrys Jones Substation would be constructed at the terminus of the 138 kV transmission line, and would be located on private property east of Highway 93 and south of Kane Springs Road in the vicinity of the terminal storage tank. As described for the terminal storage tank, the substation would not be visible from the highway because of distance and from the intervening terrain.

Short-term (3 to 4 months) visual impacts would occur during construction, as views of construction equipment, increased traffic and construction activities are introduced into the local viewshed. Most of the project disturbance would be within the Kane Springs Road ROW. Clearing and excavation activities associated with the installation of project components would remove vegetation communities within the pipeline alignment. Immediately following installation, these areas would be reclaimed and revegetated to pre-construction levels. Construction-related visual impacts would continue to occur in these areas until vegetation has reestablished on disturbed areas. The visual impact of vegetation removal would be minimal because of low color contrast associated with the characteristic vegetation and the underlying soils.

4.11.1.1 Sensitive Viewing Areas

The proposed overhead transmission line would be constructed within the foreground distance zone of sensitive viewing areas, which is limited to Highway 93. No other proposed facilities would be visible from sensitive viewing areas, as they are isolated from views by distance or intervening terrain (seldom seen distance zone).

None of the proposed facilities on the BLM-administered public lands would be within the unobstructed viewshed of the KOP or other segments of the highway because proposed facilities on the BLM lands are in the seldom-seen distance zone.

The 138 kV transmission line would span Highway 93 at Kane Springs Road to interconnect with an existing electric transmission line located on the west side of the highway ROW. The wood poles of the distribution line would be in the foreground views seen by travelers on Highway 93. The wood poles would be small in scale relative to the existing electric transmission line and would not change the character of the rural landscape. In addition, electric distribution lines on single wood poles are a common human modification of rural landscapes. The impact to viewers would be low.

The viewers with the most sensitivity to changes in the existing natural landscape from the Proposed Action would be those traveling the Kane Springs Road. The Proposed Action would add an industrial element to the existing natural landscape in the foreground distance zone as viewed from Kane Springs Road.

4.11.1.2 BLM Visual Management

With the exception of the proposed terminal storage tank, the proposed Emrys Jones Substation and overhead utilities located on private lands, the proposed project facilities would be located on BLM-administered public lands currently managed with VRM Class III objectives. The level of change from the Proposed Action would be moderate, as the natural character of the landscape would be partially retained. The Proposed Action would meet the BLM VRM Class III objectives because these objectives provide for a moderate level of change to the characteristic landscape (BLM 1986). The VRM Class within the utility corridor changed to VRM Class IV with the passage of the LCCRDA. The Proposed Action would meet VRM Class IV objectives, which provide for a high level of change to the characteristic landscape.

As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater to the LCWD service territory produced from up to four wells. The wells would be located within the LCCRDA utility corridor and would not be visible from any sensitive viewing area. Full build out of the Proposed Action, under Phases 2 and 3, would maximize delivery up to 5,000 AFY to the LCWD service territory. The number of wells proposed for Phases 2 and 3 would depend primarily on the well output from Phase 1 but could include two to four additional wells. There would be no additional impact to visual resources from Phases 2 and 3 as viewed from sensitive viewing areas from additional wells located within the VRM Class IV utility corridor. The environmental protection measures referenced in Section 2.1.4 - Applicant Proposed Environmental Protection Measures and **Appendix C** - Standard Construction and Operation Procedures would be applied under Phase 1 of the Proposed Action and would be effective to minimize impacts of the build out condition.

4.11.2 Alternative 1

Impacts to visual resources under Alternative 1 would be similar to those described for the Proposed Action. However, under Alternative 1, the overhead power line would stay entirely within the LCCRDA corridor between Highway 93 and the Emrys Jones Substation. The only sensitive viewing area for this alternative would be along Highway 93. The proposed power lines would be partially screened from view by existing topography along the highway.

4.11.3 No Action Alternative

Under the No Action Alternative, the proposed water development facilities would not be installed and operated within the project area; however, the proposed Emrys Jones Substation and the 138 kV transmission line would still be constructed on private or leased lands. There would be no effect on the existing visual condition from the proposed water development facilities including transmission and collection pipelines, wells and associated tie-in roads, well substations and associated tie-in roads, and storage tanks. The BLM-administered public lands would continue to be managed to protect and maintain existing improvements and uses. Development of private and leased lands within and adjacent to the project area would continue.

4.11.4 Mitigation

Mitigation measures are meant to minimize undesirable contrasts of project facilities with the existing landscape. Mitigation would enable proposed project facilities to harmonize with the surrounding landscape to the extent feasible and to meet VRM objectives for visual resources. In general, implementation of resource protection measures proposed for erosion control, road construction, rehabilitation and revegetation, and wildlife protection would also mitigate effects to visual quality. As presented in Section 2.1.4 - Applicant Proposed Environmental Protection Measures, the Applicant would implement environmental protection measures as presented in **Appendix C** – Standard Construction and Operation Procedures. Measures presented in **Appendix C** that would minimize impacts on visual resources presented in this section are measures V-1 through V-7, LP-1 through LP-3, ESC-2, ESC-3, ESC-5, ESC-6 PUCC-1, R-1 through R-3, R-8, and R10 through R-15. No additional mitigation beyond those implemented as part of the Proposed Action would be required.

4.12 SOCIOECONOMICS

The ROI for the socioeconomic analysis encompasses Lincoln and Clark Counties, Nevada. Additional labor data are provided for communities located closest to the ROI, as it is likely that the project workforce would reside in the outlying communities of Las Vegas and Mesquite. The communities of Alamo and Caliente in Lincoln County, and Las Vegas and Mesquite in Clark County, are the foci of the analysis for housing, public and other community services; recreation; county and municipal finances; crime; and the local transportation network, as these are the jurisdictions that would experience effects on these aspects of the social and economic environment. Demographic data for Nevada are included to set the Proposed Action in a regional context.

4.12.1 Proposed Action

Implementation of the Proposed Action would have a minimal affect on the social and economic resources from the associated increase in the level of economic activity. Increased economic activity would result from increased payroll earnings during project construction, which would be spent on items such as housing, food, goods and services. These social and economic effects would occur where the Proposed Action workforce would reside, primarily in Clark County.

The Proposed Action would not have any direct growth-inducing effects because it is estimated to take from 90 to 180 days to complete and require a construction workforce of no more than 160 workers. Indirect effects would result from continuing planned developments in Clark and Lincoln Counties.

4.12.1.1 Population and Housing

Most construction workers that would be required to construct the Proposed Action facilities would commute from the Las Vegas area, which is within a daily commute distance. It is not anticipated that construction of the Proposed Action would result in an influx of new residents into the region. Therefore, there would be no local or regional population impacts and no demand for new permanent housing. In the event that workers migrate into Lincoln County and the Las Vegas area for the construction period, the relatively small number of such workers is unlikely to affect temporary housing stock. There are 43 motel rooms in Alamo and 76 motel rooms in Caliente. While temporary housing in Lincoln County is limited, there are nearly 150,000 hotel rooms in the Las Vegas metropolitan area. Construction of the project would result in no more than 160 temporary jobs that would last for no more than 180 days. Therefore, construction of the Proposed Action facilities would not have a measureable effect on population or housing.

4.12.1.2 Economy and Employment

In 2005, there was an average of 17 construction workers in Lincoln County. At an average 2005 unemployment rate of 5.1 percent, it was estimated that one construction worker was unemployed in Lincoln County in 2005. Therefore, assuming that the 2007 scenario is similar to that of 2005, most of the project workforce would be based in Clark County, primarily in the Las Vegas area. There were an estimated 101,550 construction workers in Clark County in 2005. This represents more than an ample construction labor force in the Las Vegas area to meet the construction requirements of the Proposed Action.

The development of the project facilities would require approximately 160 workers for up to 120 days. This would provide employment for construction workers primarily from the Las Vegas area, resulting in a minimally positive effect on payroll earnings during project construction. The new construction would benefit the Lincoln County tax base from increased sales and use taxes and from project-related purchases of goods and services. The construction and operation of the Proposed Action would not have any measurable influence on the Clark County economy.

4.12.1.3 Public Utilities and Services

Solid wastes would be generated primarily by construction. Disposal of the amount of wastes generated from construction and operation would not affect the life expectancy of the municipal solid waste facilities currently operating in regional area. Any hazardous materials would be disposed at an EPA-approved hazardous waste facility.

Because an influx of in-migrating employees and their families is not anticipated to meet the Proposed Action construction labor needs, there would be no effect on public utilities and services, fire protection, police protection, schools or parks and recreation facilities in Lincoln County resulting from increased population.

4.12.2 Alternative 1

The socioeconomic characteristics and potential impacts of Alternative 1 are similar to those of the Proposed Action.

4.12.3 No Action Alternative

Under the No Action Alternative, the ROW on federal lands would not be granted to the LCWD. No ground disturbance would occur from the Proposed Action, and there would be no associated direct or indirect impacts.

4.12.4 Mitigation

As described in Chapter 2.0 - Proposed Action and Alternatives, construction and operation of Phase 1 of the Proposed Action would provide up to 1,000 AFY of groundwater to the LCWD service territory. Full build out of the Proposed Action, under Phases 2 and 3, would maximize delivery up to 5,000 AFY to the LCWD service territory. Full build out would not generate additional impacts on socioeconomics. The environmental protection measures referenced in Section 2.1.4 - Applicant Proposed Environmental Protection Measures and **Appendix C** - Standard Construction and Operation Procedures (Reference Number HM-7) would be applied under Phase 1 of the Proposed Action and would be sufficient to minimize impacts of the build out condition.

4.13 ENVIRONMENTAL JUSTICE

Executive Order 12898 requires an analysis of impacts of a federal action on disproportionate minority and low-income population. There are no such populations within the vicinity of the project area. The Moapa River Indian Tribe is the closest minority community and is located approximately 30 miles south of the project area.

4.13.1 Proposed Action

Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations because these populations are not present in the vicinity of the project area. Based on the information gathered from the U.S. Census Bureau, minority populations comprise less than 5 percent of the population in Lincoln County (see Table 3-16 in Chapter 3.0). This is 1) less than the 50 percent definition of a minority population and 2) not a meaningfully greater percentage than the minority population of the county or state, as cited in the CEQ's Environmental Justice Guidance under the National Environmental Policy Act (CEQ 1997). Therefore, implementation of the Proposed Action would have no impact on environmental justice issues.

4.13.2 Alternative 1

The environmental justice characteristics and potential impacts of Alternative 1 are similar to those of the Proposed Action.

4.13.3 No Action Alternative

Under the No Action Alternative, the ROW would not be granted. No impacts associated with the Proposed Action or Alternative 1 would occur to minority or low-income populations under the No Action Alternative.

4.13.4 Mitigation

No mitigation is required.

4.14 HAZARDOUS MATERIALS AND SOLID WASTES

4.14.1 Proposed Action

Hazardous and toxic materials, such as fuels and solvents, would be transported, used and stored in the project area during both the construction and operation phases of the Proposed Action. Accidental release of hazardous and toxic materials could cause harm to human health and the environment if not handled properly. Measures to minimize potential for accidental spills or hazardous materials are outlined in the Environmental Management Plan and SPCCC Plan prepared by the LCWD. The LCWD, LCPD and the LCT would each employ on-site Construction and Environmental Inspectors who would ensure compliance with all regulatory requirements. Solid wastes would be generated primarily by construction activities. Disposal of the amount of wastes generated from construction and operation would not affect the life expectancy of the municipal solid waste facilities currently operating in the region. Any hazardous materials would be disposed at an EPA-approved hazardous waste facility. Therefore, there would be no impact from the Proposed Action on existing waste facilities in the region.

4.14.2 Alternative 1

The impacts of hazardous materials and solid waste potential under Alternative 1 would be similar to those for the Proposed Action for both construction and operation activities.

4.14.3 No Action Alternative

Under the No Action Alternative, the ROW would not be granted, and the potential impacts described above would not occur.

4.14.4 Mitigation

Applicant proposed measures to reduce or minimize construction-related impacts are described in Section 2.1.4 - Applicant Proposed Environmental Protection Measures and **Appendix C** - Standard Construction and Operation Procedures. These environmental protection measures would be applied during all phases of construction. No additional mitigation beyond those implemented as part of the Proposed Action would be required.

4.15 PALEONTOLOGICAL RESOURCES

4.15.1 Proposed Action

There are no known impacts on paleontological resources that would result from construction, operation and maintenance of the Proposed Action. However, construction activities (e.g., excavation of pipeline trenches) may result in unanticipated exposure of Holocene and late Pleistocene fossils. If fossil flora and fauna are discovered during construction, the BLM would be contacted, according to the standard operating procedures presented in **Appendix C** (CR-1 to 8 and 10), to determine steps necessary to evaluate the need to preserve the fossils.

4.15.2 Alternative 1

Implementation of Alternative 1 would result in impacts similar to those described for the Proposed Action for construction of the 138 kV transmission line and buried fiber optic line (between Highway 93 and the Emrys Jones Substation) only. If fossil flora and fauna are discovered during construction, the BLM would be contacted, according to the SOPs presented in **Appendix C** (CR-1 to 8 and 10), to determine steps necessary to evaluate the need to preserve the fossils.

4.15.3 No Action Alternative

Under the No Action Alternative, the ROW would not be granted. No impacts associated with the Proposed Action or Alternative 1 would occur to paleontological resources.

4.15.4 Mitigation

No mitigation is required for the Proposed Action or Alternative 1.

4.16 ARCHAEOLOGICAL RESOURCES AND HISTORIC PROPERTIES

Compliance with Section 106 of the NHPA requires definition of an APE specific to the proposed undertaking and specific to the nature of the historic properties that may be affected. Historic properties are those archaeological or historical sites and traditional cultural concerns that are listed on or eligible for the NRHP. Both direct and indirect effects are considered, and the APE may be different for each class of effects. Direct effects include physical damage to the historic properties and indirect effects may occur farther away in space or time and include diminished integrity of the setting for which contributed to the significance of a historic property. Areas of direct effect would be associated with production well development; construction of well yards, pipeline and power line; and storage tanks and associated components. The APE for the Proposed Action consists of the proposed pipeline corridor (300 feet wide) which begins at the intersection of U.S. Highway 93 and Kane Springs Wash Road and extends approximately 16.7 miles east and northeast along the southern edge of the existing graded road. An additional proposed alternative corridor (300 foot wide) begins at the existing Kane Springs Wash Road and extends approximately 3 miles west along the northern boundary of the CSI development area within BLM managed lands, ending at the edge of the U.S. Highway 93 ROW.

The principal measure of effects on historic properties is the potential adverse diminishment of the integrity or significant characteristics that make the property eligible for the NRHP. These effects may result from direct construction ground-disturbing activities or the introduction of visual, atmospheric or audible elements that would diminish the integrity of the historic setting, feeling or association of the property as a result of construction, operation and maintenance of the proposed project.

4.16.1 Evaluation of Effects on Historic Properties

The National Register Criteria for Evaluation (36 CFR 60.4) lists criteria that need to be considered when evaluating the eligibility of a site, district, building, structure or object. If a resource possesses integrity of location, design, setting, materials, workmanship, feeling and association, it would be eligible to the NRHP if any one of the following criteria is applicable:

a. It is associated with significant events or patterns in history or prehistory;
b. It is associated with the specific contributions of individuals significant in our past;
c. It has engineering, artistic or architectural values or is representative of a distinctive type or style; or
d. It has yielded or is likely to yield important information to address research questions in history or prehistory.

Normally, resources less than 50 years old are not eligible for the NRHP.

4.16.2 Proposed Action

The Proposed Action would result in no direct effects to National Register eligible properties or Native American traditional cultural concerns or significant properties (Section 5.2). One non-eligible historic site (Old Highway 93) that crosses the APE would be affected by construction. However this is not a historic property.

The Proposed Action crosses an extensive lithic procurement landscape. The landscape is an extensive area of obsidian procurement that also includes areas of chert procurement. At least three archaeological localities within this landscape that may be considered eligible for the NRHP may be affected. The localities are concentrations of toolstone procurement and reduction activity that may have the potential to yield information on lithic technology that contributes to significant research questions in prehistory (Criterion d). Additional detailed documentation of these localities and agency consultation concerning their eligibility is ongoing. If these surface sites are determined to be historic properties, adverse impact by the Proposed Action may be mitigable by detailed documentation of the important information that they contain.

Construction would have no indirect effects on any historic landscape or known rock art site, geoglyph or toolstone quarry eligible under Criteria a, b or c (State Protocol Agreement between the BLM and the SHPO, VII C. 2), as these sites have not been identified in the project area.

Operation and maintenance of the Proposed Action would have no direct or indirect effects on any historic landscape or known rock art site, geoglyph or toolstone quarry eligible under Criteria a, b or c (State Protocol Agreement VII C. 2), as these sites have not been identified in the project area.

Unanticipated subsurface archaeological resources may be discovered during ground-disturbing activities associated with implementation of the Proposed Action. In addition, though unlikely, human remains may be discovered during ground-disturbing activities. Stipulations for identification and treatment of unanticipated discoveries are presented in **Appendix C** (CR-1 to 9).

4.16.3 Alternative 1

Alternative 1 would result in no direct or indirect effects to known historic properties or traditional cultural concerns or significant properties (Section 5.2). One non-eligible historic site (Old Highway 93) crosses the APE and would be impacted by construction. Ground-disturbing activities proposed for this alternative are somewhat less than the Proposed Action; however, unanticipated subsurface archaeological resources and human remains may be discovered during ground-disturbing activities. Stipulations for identification and treatment of unanticipated discoveries are presented in **Appendix C** (CR-1 to 9).

4.16.4 No Action Alternative

No historic properties would be affected under the No Action Alternative.

4.16.5 Mitigation

If the archaeological lithic procurement localities in the APE of the Proposed Action are determined to be historic properties, treatment measures will be implemented to avoid, minimize or mitigate adverse impact to these resources. The detailed documentation that is underway to evaluate the eligibility of these localities could be adequate to mitigate adverse impact within the APE. If previously unidentified cultural resources (including human remains) are discovered, the procedures outlined in State Protocol Agreement, Section VIII (Discovery Situations) would be adhered to. Under the agreement, all related construction activities would cease within 100 meters of the find, and the LCWD representative would notify the BLM authorized officer. The BLM, in coordination with the SHPO, interested persons and Tribal representatives, would determine if construction activities can proceed or if mitigation is required. If mitigation is required, the BLM (in consultation with the SHPO, interested persons and Tribal representatives) would notify the LCWD of the need for mitigation, and mitigation measures would be implemented. The BLM would ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recover Program (42 FR 5377-79). Activities may resume after the BLM notifies the LCWD that the mitigation process is complete.

4.17 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Unavoidable impacts are those that would occur after implementation of all committed and recommended additional mitigation measures. Unavoidable impacts do not include temporary or permanent impacts associated with the Proposed Action, which would be mitigated. Neither do they include impacts from speculative events such as hazardous waste spills that are not cleaned up promptly in accordance with accepted mitigating measures or future wildland fire events.

The Proposed Action would result in the permanent conversion of approximately 25 acres from undeveloped desert to utility-related use, of which approximately 17 acres would be public lands within the LCCRDA utility corridor. These lands are located within the Kane Springs ACEC and support habitat for desert tortoise and other wildlife. Most of the disturbance would be located along the Kane Springs Road ROW. The introduction of aboveground features would change the visual characteristics of the surrounding landscape, which includes the Delamar Mountains and Meadow Valley Range Wildernesses.

The LCWD has committed to minimizing potential short-term and long-term environmental and social impacts of the Proposed Action through project design and development of site-specific measures. Design, construction and operation features of the Proposed Action that are intended to avoid or minimize impacts are described in Section 2.1.4 – Applicant Proposed Environmental Protection Measures and outlined in **Appendix C** - Standard Construction and Operation Procedures.

If additional mitigation requirements are identified through the NEPA or water rights application process, the Applicant would develop appropriate measures in consultation with the requesting agency (e.g., USFWS, Army Corps of Engineers, Nevada State Engineer) and include these in their project design. The USFWS may identify additional measures ("terms and conditions") to minimize the incidental take of listed species during the Section 7 consultation process; the Applicant would be required to implement these to be in compliance with the incidental take permit.

4.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section describes the irreversible and irretrievable commitments of resources associated with implementing the Proposed Action. A commitment of resources is irreversible when primary or secondary impacts limit the future options for a resource. An irretrievable commitment refers to the lost production or use of a resource that would cause the resource to be unavailable for use by future generations. Examples of these types of resources include nonrenewable resources, such as minerals and cultural resources, and renewable resources that would be unavailable for the use of future generations such as loss of production, harvest or habitat.

Constructing, operating and maintaining the Proposed Action would require committing land, soil and vegetation to place aboveground facilities including well yards, access roads and overhead electric power lines. While it is possible that these components could be removed and the natural landscape restored, it is unlikely in the foreseeable future. Therefore, these structures would constitute an irretrievable commitment of land. Construction of Alternative 1 would require the use of similar amounts of land, soil and vegetation.

The areas occupied by aboveground features would be irreversibly removed from natural habitat. Potential habitat for the desert tortoise would be lost from placing aboveground facilities and access roads. However, implementation of Applicant-proposed environmental protection measures will minimize the number of individual tortoises that would be affected. Alternative 1 would result in a greater disturbance to desert tortoise habitat than the Applicant's Proposed Action because its features (including a temporary access road) would use more undisturbed lands for the placement of the overhead lines during construction.

Construction of the Proposed Action would require an irretrievable and irreversible commitment of building materials and fuel for construction equipment. Materials used for constructing the groundwater facilities are ultimately recyclable but would remain an irreversible commitment of resources. Implementation of the Proposed Action would require an irreversible commitment of a limited amount of sand and gravel resources extracted from local sources. As described in Chapter 2.0, 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.

Small quantities of fossil fuels would be irretrievably consumed during the construction and maintenance of the project. The consumption of fuel would be of relatively short duration and would not constitute a long-term drain on local resources.

4.19 SHORT-TERM AND LONG-TERM PRODUCTIVITY

This section discusses the short-term use of the local environment and the maintenance and enhancement of long-term productivity as a result of implementation of the Proposed Action. For the purposes of this discussion, "short-term" is defined as the 3- to 4-month period during construction and up to 1 year following initial operation. "Long-term" is defined as the entire operational life of the Proposed Action, which is anticipated to be indefinite. Facilities associated with the Proposed Action are expected to be in place for long-term use to move groundwater to the Coyote Spring Valley area and may be replaced or upgraded in the future.

4.19.1 Short-Term Uses

During construction of Phase 1, up to 195 acres would be temporarily disturbed. Of this amount, approximately 167 acres are BLM-admininstered public lands. Short-term impacts to physical resources would result from land-clearing and construction activities. Personnel and equipment moving around the project area would disperse wildlife and temporarily eliminate habitats. Effects to air quality and ambient noise would be short-term and localized during construction. Up to 500,000 gallons of water would be required for hydrostatic testing of the entire water transmission pipeline.

Impacts to social and economic resources would be primarily short-term (3 to 4 months) effects to the local economy. During construction activities, revenue would likely increase for some local businesses such as construction suppliers, hotels, restaurants, gas stations and grocery stores.

4.19.2 Long-Term Uses

Approximately 25 acres would be permanently disturbed by utility-related uses. The remaining acreage would be reclaimed to pre-construction levels. Although the Proposed Action would not require a major amount of land to be taken out of production, construction-related disturbances of previously undisturbed biological habitats could result in long-term reductions in the biological productivity of the area, as biological communities in arid regions tend to recover very slowly from disturbances. As described in Chapter 2.0 - Proposed Action and Alternatives, up to

1,000 AFY of groundwater would be pumped from the Kane Springs Valley Hydrographic Basin and transported to the LCWD service territory within the Coyote Spring Valley Hydrographic Basin. Full build out of the Proposed Action, under Phases 2 and 3, would maximize delivery up to 5,000 AFY within the LCWD service territory. Assuming a 0.5 AFY allocation per dwelling unit, the 1,000 AFY would accommodate 2,000 dwelling units and 5,000 AFY would enable development of 10,000 dwelling units within the CSI project.

The LCWD would provide a fire hydrant for access/use to support fire suppression activities. Construction of the Proposed Action would contribute long-term socioeconomic benefits to Lincoln County including business development and regional growth.

4.20 CUMULATIVE IMPACTS

4.20.1 Regulations and Guidance

The CEQ Regulations for Implementing the Procedural Provisions of NEPA define a cumulative impact as:

> "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

Past, present and reasonably foreseeable future actions (RFFAs) are analyzed to the extent that "they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have an additive and significant relationship to those effects."

The CEQ regulations require including a discussion of cumulative actions and connected actions in the scope of the environmental review. These terms are defined as follows:

- Cumulative actions are those "which when viewed with other proposed actions have cumulatively significant impacts and would therefore be discussed in the same [environmental review]" [40 CFR 1508.25(a) (2)].
- Connected actions are those closely related. "Actions are connected if they: (i) automatically trigger other actions which may require environmental review; (ii) cannot or would not proceed unless other actions are taken previously or simultaneously; or (iii) are interdependent parts of a larger action and depend on that larger action for their justification" [40 CFR 1508.25(a) (1)].

Cumulative effects can result from individually minor, but collectively significant, actions taking place over time. Cumulative effects can also result from spatial (geographic) and temporal (time) crowding of environmental impacts. Said another way, the effects of human activities would accumulate when a second impact occurs at a site before the system can fully rebound from the effect of the first impact. For the purposes of this analysis and under federal regulations, "impacts" and "effects" are assumed to be interchangeable.

While there is not a universally accepted framework for cumulative effects analysis, eight general principles identified in Considering Cumulative Effects under the National Environmental Policy Act (CEQ 2005) have gained acceptance. These eight principles are based on the premise that resources, ecosystems and the human community each can experience effects. For each of these, there are thresholds, or levels, of stress beyond which their desired conditions degrade. The following is a summary of the CEQ's eight principles of cumulative effects analysis:

1) Cumulative effects are caused by the aggregate of past, present and reasonably foreseeable future actions. These include any other actions that affect the same resources.
2) Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem or human community of all actions taken, no matter who (federal, non-federal or private) has taken the actions. Effects of individual activities may interact to cause additional effects that are not apparent when looking at individual effects one at a time.
3) Cumulative effects need to be analyzed in terms of the specific resource, ecosystem or human community being affected, as opposed to from the perspective of the Proposed Action. Analyzing cumulative effects involves developing an understanding of how the resources are susceptible to effects.
4) It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those effects that are truly meaningful. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties.
5) Cumulative effects on a given resource, ecosystem or human community are rarely aligned with political or administration boundaries. Cumulative effects analysis on natural systems must use natural ecological boundaries; analysis of human communities must use actual socio-cultural boundaries to ensure inclusion of all effects.
6) Cumulative effects may result from accumulation of similar effects or from the synergistic interaction of different effects. In some cases, the net adverse cumulative effect is less than the sum of the individual effects; in other cases, the net adverse cumulative effect is greater.
7) Cumulative effects may last for many years beyond the life of the action that caused the effects. Cumulative effects analysis needs to apply the best science and forecasting techniques.
8) Each affected resource, ecosystem or human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters. The most effective cumulative effects analysis focuses on what is needed to ensure long-term productivity or sustainability of the resource.

4.20.2 Methodology for Assessing Cumulative Impacts

The environmental consequences of the Proposed Action were evaluated earlier in this chapter. Based on the analysis of the environmental resources, cumulative impacts were assessed by combining the potential effects of the Proposed Action (direct effects) with the effects of past actions, present actions (including the Proposed Action), and RFFAs (indirect effects) in the cumulative resource ROI. The extent of the cumulative resource ROI varies with each resource, based on the geographic or biologic limit of that resource. For the purposes of this analysis, the cumulative resource ROI includes the following areas:

- The area adjacent to the proposed ROW, nearby off-site areas subject to disturbance from the Proposed Action or alternatives, and those areas beneath new facilities that would remain inaccessible for the life of the project;
- As appropriate, the affected watersheds including Kane Springs Valley, Coyote Spring Valley, Muddy River Springs Area and the Lower Moapa Valley. In the context of this EIS, these watersheds are synonymous with the Hydrographic Basins recognized by the Nevada State Engineer and U.S. Geological Service; and
- Mormon Mesa Critical Habitat Unit.

In addition, the length of time for cumulative effects analysis varies according to the duration of impacts from the Proposed Action on the particular resource. The timeframe for the cumulative impact analysis encompasses past and present activities in the areas described above, and future activities that may extend up to 20 years in the future.

Information about past, present and reasonably foreseeable future activities in the cumulative resource ROI were gathered from the BLM, USFWS, Lincoln and Clark Counties, and other agencies, adopted plans, environmental documents and personal communications with public agencies and utility companies. Project-related actions that were considered include the following:

- Applications have been submitted to the BLM or other agencies and are in various stages of the approval/permitting process as of April 2007;
- Actions that have been approved or are currently discussed in the public realm and have a reasonable likelihood of being implemented;
- Actions included in an adopted capital improvement program, general plan, regional transportation plan or similar plan;
- Actions anticipated as later phases of approved activities; or
- Actions funded by money budgeted by a public agency.

The resources to be analyzed and the potential interrelated projects that may have cumulative effects are summarized in **Table 4-4**. The locations of interrelated projects relative to the project area for the Proposed Action are depicted on **Map 4-1.**

Table 4-4
Interrelated Project Analysis for Cumulative Impacts

Resource	Interrelated Projects Analyzed (see legend)
Soil Resources	1, 2 and 5
Water Resources	1, 2, 3, 6 through 13
Vegetation Resources	1 through 7, 10, 11, 12
Wildlife Resources	1 through 7, 10, 11, 12
Land Use	1-6, 8, 11, 13, 14
Areas of Critical Concerns (ACECs)	1, 2, 4, 6, 11
Visual Resources	2, 4, 6, 11
Socioeconomic Resources	1 through 14

1 – Lincoln County Conservation, Recreation, Development Act
2 – Coyote Spring Development – Lincoln County
3 – Coyote Spring Development – Clark County
4 – LS Power Electric Transmission Project (500 kV transmission line in the designated Southwest Inter-tie Corridor)
5 – Coyote Spring 138 kV Transmission Line Project
6 – Ely Energy Center Project (500 kV transmission line in the designated LCCRDA corridor)
7 – Coyote Spring Well and Moapa Transmission System Project
8 – Lincoln County Land Act Groundwater Development Project
9 – Toquop Energy Project
10 – Additional Moapa Valley Water District Groundwater Pumping in Upper Moapa Valley
11 – Clark, Lincoln, and White Pine Counties Groundwater Development Project
12 – Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights
13 – Alamo Industrial Park and Community Expansion Land Sale
14 – Build-Out of the Lincoln County Land Act Area (Toquop Township Planning Area)

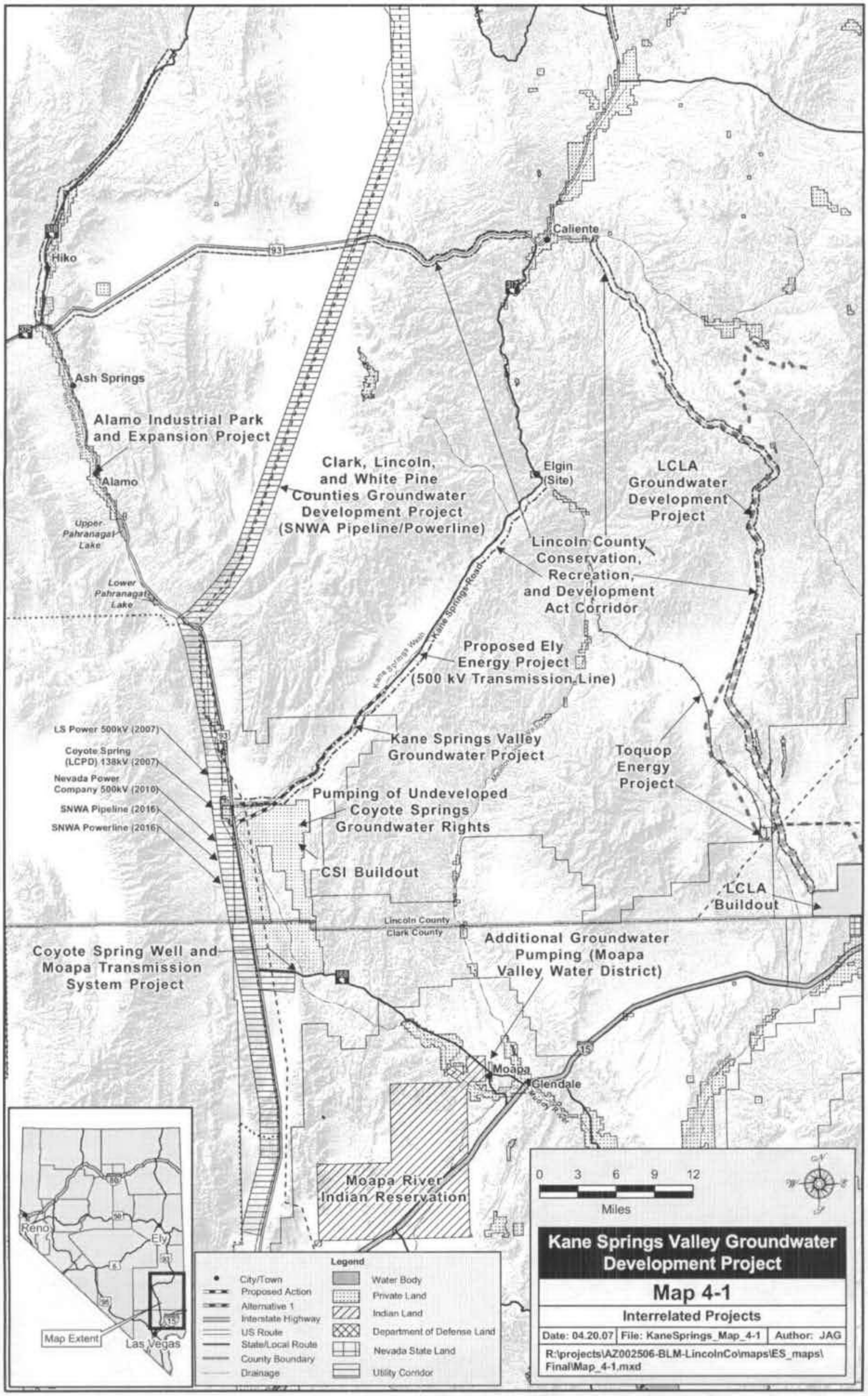
4.20.3 Cumulative Projects Considered

4.20.3.1 Past Actions

Past human actions in the project area include livestock grazing, isolated mining exploration in the surrounding mountains, construction of Kane Springs Road and Highway 93, OHV recreation use, and the installation of fiber optic and electric transmission lines along Highway 93.

Past natural processes in the project area include wildland fire, flooding, drought, and the spread of invasive species and noxious weeds. In June 2005, a total of 739,000 acres of land in southern Nevada burned over 19 days, with approximately 148,000 acres of the fire occurring in the Meadow Valley portion of the complex, adjacent to Kane Springs Valley.

Intense flooding occurred in the Kane Springs Wash in January 2005 and July 2006. Flood intensity was exacerbated by the loss of vegetative cover as a result of wildland fires in the Kane Springs Valley in 2006 and ongoing drought conditions in the western United States. A consequence of wildland fires is the increased potential for flashflood runoff from surrounding mountain ranges. Until vegetative cover is established, post-fire erosion rates are expected to increase. In addition, these burn areas represent an area of disturbance that favors the spread and establishment of noxious and invasive weed species (Wagonner 2007). Without proper treatment, the proliferation of these species will increase the risk of wildland fire events in the future.



Caliente
Hiko
Ash Springs
Alamo Industrial Park and Expansion Project
Alamo
Upper Pahranagat Lake
Lower Pahranagat Lake
Clark, Lincoln, and White Pine Counties Groundwater Development Project (SNWA Pipeline/Powerline)
Elgin (Site)
LCLA Groundwater Development Project
Lincoln County Conservation, Recreation, and Development Act Corridor
Kane Springs Road
Kane Springs Wash
Proposed Ely Energy Project (500 kV Transmission Line)
LS Power 500kV (2007)
Coyote Spring (LCPD) 138kV (2007)
Nevada Power Company 500kV (2010)
SNWA Pipeline (2016)
SNWA Powerline (2016)
Kane Springs Valley Groundwater Project
Toquop Energy Project
Pumping of Undeveloped Coyote Springs Groundwater Rights
CSI Buildout
LCLA Buildout
Lincoln County
Clark County
Additional Groundwater Pumping (Moapa Valley Water District)
Coyote Spring Well and Moapa Transmission System Project
Moapa
Glendale
Moapa River Indian Reservation
Reno
Ely
Las Vegas
Map Extent
Legend
City/Town
Proposed Action
Alternative 1
Interstate Highway
US Route
State/Local Route
County Boundary
Drainage
Water Body
Private Land
Indian Land
Department of Defense Land
Nevada State Land
Utility Corridor
0 3 6 9 12
Miles
Kane Springs Valley Groundwater Development Project
Map 4-1
Interrelated Projects
Date: 04.20.07
File: KaneSprings_Map_4-1
Author: JAG
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Global climate change, commonly referred to as global warming, has been cited for these changes in the regional area. Ongoing scientific research into global climate change correlates increasing atmospheric concentrations of greenhouse gases (including carbon dioxide, methane, nitrous oxide, water vapor, and several trace compounds) with observed trends of increasing temperatures and changes in the amount and seasonal variability precipitation. The assessment of greenhouse gas emissions and climate change is in its formative phase, and the net impact to climate cannot yet be determined with an acceptable degree of certainty. Although uncertainty exists as to whether observed climate changes reflect natural variations or may be caused by increasing emissions of greenhouse gases, there is consensus that global temperatures have been increasing and will continue to increase in the future. As global warming trends continue into the foreseeable future, Chambers (2006) indicates that the following changes may be expected to occur within the Great Basin, which includes the project area.

The amount and seasonal variability of precipitation will increase over most areas. IPCC (2001) climate model scenarios indicate that by 2100, precipitation will increase about 10 percent in summer, about 30 percent in fall, and 40 percent in winter. Less snowfall will accumulate in higher elevations, more precipitation will occur as rain, and snowmelt will occur earlier in the spring because of higher temperatures.

- Streamflow patterns will change in response to reduced snowpacks and increasing precipitation. Peak flows in spring are expected to occur earlier and be of lower magnitude because of snowpack changes. Runoff from greater amounts of winter rainfall will cause higher winter flows. Summer flows will be lower, but with higher variability depending on the severity of storm events.
- Some populations of native plants, invasive species, and pests will expand. Increasing amounts of atmospheric carbon dioxide and precipitation during the growing season provide favorable growth conditions for native grasses, perennial forbs, woody species, and invasive annuals such as cheatgrass. Insect populations also will likely increase because milder winter temperatures will improve reproduction and survival rates.
- Fire frequency, severity, and extent will increase because of the increased availability of fine fuels (grasses, forbs, and invasives) and accumulation of fuels from previous growing seasons. Higher temperatures will extend the length of fire seasons. Expansion of pinyon-juniper species and increasing tree densities could increase the number of high severity crown fires. Higher rates of insect damage and disease also may increase fuel accumulations.
- Sensitive species and overall biodiversity will be reduced. High-elevation habitats will shrink in area or disappear as lower-elevation plant communities expand. It is probable that some mammalian, avian, and other species that currently inhabit these high-elevation habitats may become extinct. Higher rates of disease and insect damage also may pose threats to other sensitive plant and animal species.

4.20.3.2 Present Actions, Including the Proposed Action

Present actions include the Proposed Action, which is described in Chapter 2.0 and analyzed earlier in this chapter. Other projects or events, which are currently underway or may occur in the area, include:

Present Natural and Human Processes

- OHV and other recreational use
- Livestock grazing
- Wildland fire
- Drought
- Flooding in Kane Springs Wash

Energy Development Projects

- LS Power Electric Transmission Project

Land Development Projects

- CSI Development – Clark County
- Alamo Industrial Park and Community Expansion Land Sale

OHV activities and other recreational use within the project area are ongoing. The Kane Springs Road provides access to the Delamar and Meadow Valley Wildernesses and continues on to SR 317. The Lincoln County Transportation Department conducts periodic maintenance (grading and leveling) as needed.

Livestock grazing activities have been limited due to the 2005 fire events and drought conditions. However, some grazing continues at a reduced stocking rate. Stocking rates are coordinated between the BLM and lease holders to maintain a sustainable forage level.

Wildland fire events are expected to occur in the area due to the increased incidence of invasive and noxious weed species. In addition, flashflood runoff from high-magnitude rain events would be exacerbated by existing landcover conditions and any future wildland fires in the area.

Projects that are currently funded and underway are described in the following section. Impact characteristics of each project are summarized in **Table 4-5.** The environmental impacts associated with these projects have been analyzed.

4.20.3.2.1 Coyote Spring Development - Clark County

CSI is developing a master planned community encompassing approximately 6,881 acres of private land and approximately 6,219 acres of leased land within Clark County, Nevada. The northern end of this development is approximately 9 miles south of the proposed ROW.

The Clark County community is entitled for 49,000 residential units and approximately 1,220 net acres of commercial development. Notwithstanding the entitlements, the Clark County community is currently being planned and developed for 29,000 residential units; 710 acres of mixed use; 270 acres of commercial development; and 1,210 acres of golf, parks, open space, public facilities and preserve areas.

Table 4-5
Impact Characteristics of Present Actions

Project	Project Type	Project Description	Project Location and Distance from Proposed Action
Coyote Spring Investment Development - Clark County Timing: Under construction	Residential / Commercial Development	6,881/ 6,219 acres of private/leased land; up to 49,000 residential units; approximately 1,220 net acres of commercial development. Development located near the Mormon Mesa and Coyote Spring ACECs, and the Meadow Valley Wilderness.	Clark County development approximately 9 miles south of project area
LS Power Electrical Transmission Project To be located in the previously permitted SWIP corridor. Timing: Construction late 2007	Multi-State Transmission Line	540-mile long 500 kV transmission line between Twin Falls, Idaho and the Dry Lake area northeast of Las Vegas. Approximately 383 miles to be located in the BLM Ely District that would parallel the west side of U.S. Highway 93 near the project area.	Parallels the west side of. Highway 93; portions of the transmission line would be located west of the project area Transmission line to be located in the permitted SWIP Corridor
Alamo Industrial Park and Community Expansion Land Sale Timing: Fall 2007	Industrial Park and Residential Development	Industrial park including infrastructure: water, sewer, drainage and highway access improvements. 638 acres of residential development.	Alamo, Nevada, along U.S. Highway 93 in Sections 4, 5, 8 and 9 of T7S, R61 E. Located ~25 miles northwest of the project area

ACEC – Area of Critical Environmental Concern BLM – Bureau of Land Management SWIP – Southwest Inter-tie Project

The leased land is designated as the Coyote Spring Resource Management Area and would not be developed. Initial development plans identify a variety of housing options, golf courses, commercial centers, heliport(s), industrial sites, schools and governmental facilities. CSI selected Pardee Homes of Nevada as the master residential developer for the Clark County community. The ground breaking for the Clark County community occurred in late 2005. Golf course, road and utility improvements are under construction. The first phase is anticipated to be completed within 2 to 7 years.

Conservation measures have been incorporated into the proposed development including perpetual conservation easements, preservation and restoration of waters of the United States, dedication of water rights to the survival and recovery of the Moapa dace, desert tortoise conservation measures, and natural wash buffer zones (Lincoln County 2006). Reclaimed wastewater would be utilized for golf course, park and common area landscape irrigation to the maximum reasonable extent.

CSI intends to pump its permitted groundwater rights in the Coyote Spring Valley to serve the initial demand of the Clark County community. It is anticipated that an additional 15,000 AFY would be needed to serve the community at build out. CSI anticipates the additional water rights would be obtained from existing certificated rights owned by an affiliate of CSI further to the north in Lincoln County or new appropriations of groundwater in Lincoln County.

4.20.3.2.2 LS Power Electrical Transmission Project

The LS Power Electrical Transmission (LS Power) Project involves the proposed construction, operation and maintenance of a 540-mile long 500 kV transmission line between Midpoint Substation near Twin Falls, Idaho and the Dry Lake area northeast of Las Vegas. Approximately 383 miles of this project would be located in the BLM Ely District within the approved SWIP corridor, located on the west side of Highway 93. The ROW for the SWIP corridor was granted by the BLM in the 1990s. LS Power is currently developing final engineering and construction plans for the project, with construction anticipated to begin in late 2007.

4.20.3.2.3 Alamo Industrial Park and Community Expansion Land Sale

Lincoln County, under the LCCRDA, proposed the sale of certain parcels of lands administered by the BLM. The public land consists of four parcels located near the Town of Alamo, Nevada, along Highway 93 in Sections 4, 5, 8 and 9 of Township 7 South, Range 61 East (Township 7 South, Range 61 East); Mount Diablo Base; and Meridian. All four parcels (A through D) have been included for disposal in the Draft RMP/EIS for the Ely District. The proposed use of the lands includes light industrial and housing. An Environmental Assessment (NV-040-07-35) was prepared by the BLM Ely District Office in March 2007.

The BLM anticipates that the proposed land sale would occur in fall 2007. Lincoln County expects to begin construction of the utility infrastructure for the Industrial Park (i.e., water, sewer, drainage and highway access improvements) during early winter 2008. It is anticipated that the initial industrial park tenant would begin construction in early winter 2008. Development of the first phase of the 638 acres of residential land is anticipated in late 2008 (Baughman 2006).

4.20.3.3 Reasonably Foreseeable Future Actions

The RFFAs within the cumulative resource ROI include the following:

Reasonably Foreseeable Natural and Human Processes

- OHV and other recreational use
- Livestock grazing
- Wildland fire
- Drought
- Flooding in Kane Springs Wash

Groundwater/Energy Development Projects

- LCCRDA
- Coyote Spring Well and Moapa Transmission System Project
- Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project

- Clark, Lincoln, and White Pine Counties Groundwater Development Project

Groundwater Development Projects

- Additional Moapa Valley Water District Groundwater Pumping in Upper Moapa Valley
- Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights

Energy Development Projects

- Coyote Spring 138 kV Transmission Line Project
- Toquop Energy Project
- Ely Energy Center Project (500 kV transmission line in the LCCRDA corridor)

Land Development Projects

- CSI Development – Lincoln County
- Build-Out of the Lincoln County Land Act Area (Toquop Township Planning Area)

Natural processes and events that are expected to occur in the future include OHV and other recreational use within the project area and surrounding Wilderness, livestock grazing based on sustainable conditions, wildland fires, drought, and flooding of Kane Springs Wash during high magnitude rain events.

RFFAs within the cumulative impacts ROI are described in the following section. Impact characteristics of these projects are summarized in **Table 4-6**. Analysis of the environmental impacts associated with these projects has either been completed, is underway or is planned by an agency.

4.20.3.3.1 Lincoln County Conservation, Recreation and Development Act

The LCCRDA contains six titles, or key provisions. They include: 1) Land disposal; 2) Designation of Wilderness areas, 3) Establishment of 2,640-foot wide corridor for utilities, 4) Management of the Silver State Off-Highway Vehicle Trail, 5) Conveyance of the BLM-administered public lands to the State of Nevada for the conservation of natural resources or public parks, and 6) Transfer of administrative jurisdiction of land between the BLM and the USFWS. Title I (Land Disposal) and Title III (Establishment of a designated utility corridor) apply to the cumulative impacts analysis of the Proposed Action.

Title I directed the Secretary of the Interior to dispose of up to an additional 70,000 acres of federal land in Lincoln County for privatized development initiatives with 10 percent of the revenues going to Lincoln County for economic development, 5 percent to the State of Nevada for education, and 85 percent being retained by the federal government. RFFAs related to Title I include the Alamo Industrial Park and Community Expansion Land Sale (see Section 4.20.3.2.3) and Toquop Township Planning Area (see Section 4.20.3.3.11).

Table 4-6
Impact Characteristics of RFFAs

Project	Project Type	Project Description	Project Location and Distance from Proposed Action
Lincoln County Conservation, Recreation and Development Act (LCCRDA) Timing: The LCCRDA contains six titles. Establishment of utility corridors is subject to NEPA. Environmental analysis conducted on a case-by-case basis.	Federal action	The LCCRDA designated approximately 770,000 acres of Wilderness and designated utility corridors in Lincoln County for the SNWA and the LCWD. The LCCRDA also directed the Secretary of the Interior to dispose of up to an additional 70,000 acres of federal land in Lincoln County for privatized development initiatives with 10 percent of the revenues going to Lincoln County for economic development, 5 percent to the State of Nevada for education, and 85 percent being retained by the federal government.	Within project area. Portions of the LCCRDA corridor traverse Lincoln County.
Coyote Spring Investment Development – Lincoln County Timing: Pending. No construction to date. Awaiting completion of the Coyote Spring Investment Multiple Species Habitat Conservation Plan. Agreements in place with Lincoln County.	Residential / Commercial Development	22,174/7,548 acres of private/leased land; up to 111,000 residential units; up to 4,500 acres of commercial development. Development located in or near portions of the Kane Springs ACEC, and the Delamar and Meadow Valley Wildernesses.	South of, and immediately adjacent, to Proposed Action
Coyote Spring 138 kV transmission line Timing: Plan of Development submitted to Ely District Office in October 2006. In-service date anticipated Spring 2008.	Electric Transmission Project	A new 138 kV transmission line would interconnect into the proposed Scott Substation, located approximately 5 miles south of the intersection of Kane Springs Road and Highway 93. Ancillary facilities: five new substations, new distribution facilities and upgrade of existing facility.	Portions of the transmission line would be co-located in the SWIP corridor.
Ely Energy Center and Electric Transmission Project Timing: EIS under development. Applicant proposed in-service date 2011 – 2013.	Transmission Line and Coal-fired Power Plant	500 kV Transmission line from northeast Nevada to the Las Vegas area, mostly within existing BLM ROW	Due to limited capacity within the SWIP corridor, a portion of the transmission line may be constructed through the Delamar Valley south into Kane Springs Valley. Phase II may include construction of the proposed 500 kV line along Kane Springs Road within the LCCRDA corridor.

Table 4-6 (continued) Impact Characteristics of RFFAs			
Project	**Project Type**	**Project Description**	**Project Location and Distance from Proposed Action**
Coyote Spring Well and Moapa Transmission System (Coyote Spring Project) Timing: Under development / Final EA and FONSI issued June 22, 2007	Development of existing groundwater rights in Coyote Spring Valley Hydrographic Basin.	Withdrawal of up to 9,000 AFY of groundwater in Coyote Spring Valley Hydrographic Basin using new and existing facilities.	~ 11 miles due south of proposed project area
Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Timing: EIS under development.	Groundwater Development Project	Construction and operation of groundwater facilities to withdraw up to 9,340 AFY from the Tule Desert Hydrographic Basin and up to 14,481 AFY from the Clover Valley Hydrographic Basin	Tule Desert and Clover Valley Hydrographic Basins; east of the project area. Portions of the proposed ROW are located within the designated LCCRDA utility corridor.
Toquop Energy Project Timing: EIS under development	Coal-Fired Power Plant in Lincoln County	750 megawatt (MW) coal-fired power plant in southeastern Lincoln County on lands administered by the BLM Ely District. Use of up to 2,100 AFY (permitted) groundwater from the Tule Desert Hydrographic Basin. Project includes construction of a 31-mile rail from existing UP Railroad track in Meadow Valley Wash.	~28 miles southeast of the project area.
Additional Groundwater Pumping by the Moapa Valley Water District Timing: Unknown at this time.	Groundwater Development (existing rights)	The existing water right permit allows for phased increases in groundwater pumping from wells in the Upper Moapa Valley Hydrographic Basin (aka Muddy River Springs). Currently pumping up 2,400 AFY; up to 7,200 AFY is allowed.	Upper Moapa Valley; More than 30 miles southeast of project area.
Clark, Lincoln, and White Pine Counties Groundwater Development Project Timing: EIS under development; anticipate project would be constructed after 2010.	Groundwater Development	The proposed facilities include approximately 285 miles of pipeline, three pumping stations, six regulating tanks, a buried storage reservoir and a water treatment facility, Withdrawal of up to 168,000 AFY (pending)	Project facilities to be located in Spring, Snake, Cave, Dry Lake, Delamar, Lake Valley and Coyote Spring Valleys. Portions of the water transmission pipeline would be located immediately west of U.S. Highway 93.
Clark, Lincoln, and White Pine Counties 230 kV Transmission Line Timing: EIS under development; anticipate constructed after 2010.	Multi-State Transmission Line	315 miles of overhead power lines, two electrical substations and two hydro-turbine energy recovery facilities.	A portion of the transmission line would parallel the west side of U.S. Highway 93; west of the project area Transmission line to be co-located in the SWIP Corridor

Table 4-6 (continued) Impact Characteristics of RFFAs			
Project	**Project Type**	**Project Description**	**Project Location and Distance from Proposed Action**
Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights Timing: Unknown at this time	Groundwater Withdrawal	Nevada Power Company has approved groundwater rights for 2,500 AFY. No groundwater facilities for development of these rights have occurred.	Located ~ 11 miles south of project area.
Build-out of the Lincoln County Land Act Development (Toquop Township Planning Area)	Residential / Commercial Development	Development of up to 13,100 acres in southeastern Lincoln County. Preliminary build out is expected at 3.3 dwellings per gross acre over a 6,478-acre area, for a total build out of 21,377 dwellings. The build out is expected to proceed over a 20-year period.	Southeast corner of Lincoln County; north of the City of Mesquite. More than 50 miles southeast of the project area.

ACEC – Area of Critical Environmental Concern
EA – Environmental Assessment
LCWD – Lincoln County Water District
RFFA – Reasonably Foreseeable Future Action
SWIP – Southwest Inter-tie Project
LCCRDA – Lincoln County Conservation, Recreation, and Development Act
AFY – acre-feet per year
EIS – Environmental Impact Statement
MW – megawatt
ROW – right-of-way
FONSI – Finding of No Significant Impact
BLM – Bureau of Land Management
kV – kilovolt
NEPA–National Environmental Policy Act
SNWA – Southern Nevada Water Authority

Title III of the LCCRDA established a utility corridor for use by the SNWA and the LCWD contingent upon the successful compliance with requirements of NEPA. The legislation designates ROWs for the roads, wells, pipelines and other infrastructure needed for the construction and operation of a water conveyance system in Clark and Lincoln Counties. Another provision of Title III is the relocation of an existing utility corridor from the east to the west side of Highway 93 between the Highway 93-Highway 168 junction and the Kane Springs Road-Highway 93 junction. The owners of the private property to the east of Highway 93 would pay the federal government fair market value for the appreciation of their property due to this provision.

4.20.3.3.2 Coyote Springs Development - Lincoln County

CSI proposes to develop a master planned community encompassing approximately 22,174 acres of private land and approximately 7,548 acres of leased land within Lincoln County, Nevada. A portion of the Proposed Action between Highway 93 and the Emrys Jones Substation would be located on private or leased lands held by CSI.

The Lincoln County community is entitled for approximately 111,000 residential units and 4,500 acres of commercial development. Initial development plans identify a variety of residential housing, mixed-use urban villages, public buildings such as schools, and other public facilities. Commercial and light industrial development would occur to support the local community. Hotels, resorts, and casinos are proposed as well recreational facilities (e.g., golf courses, parks, and open space areas). Utilities and other infrastructure would be developed to serve the master planned community including electric, natural gas and propane, and potentially renewable energy sources (e.g., solar or geothermal facilities). Other utility infrastructure would include sanitary sewer and wastewater treatment facilities with corresponding reclaimed water storage, distribution, and disposal facilities; stormwater facilities (on and off site); solid waste transfer facilities; and telecommunication facilities. Water suppy infrastructure and management facilities, including treatment and production facilities, monitoring wells, storage facilities, and transmission and distribution facilities, would be developed to serve the community.

CSI is seeking a Section 404 permit from the Army Corps of Engineers and a Section 10 permit from the USFWS for the incidental take of Threatened or Endangered species protected by the ESA. CSI is currently developing a Multiple Species Habitat Conservation Plan (MSHCP) that will identify measures to minimize and mitigate incidental take of federally listed species that could occur as a result of CSI's planned development. The Lincoln County community would not be developed until some time after these authorizations are obtained.

Conservation measures are being incorporated into the proposed development, including perpetual conservation easements, open space, preservation and restoration of waters of the United States, dedication of water rights to the survival and recovery of the Moapa dace, desert tortoise conservation measures, and natural wash buffer zones (Lincoln County 2006). Reclaimed wastewater would be utilized for golf course, park and common area landscape irrigation to the maximum reasonable extent.

CSI developers anticipate up to 55,000 AFY of water would be needed to serve the CSI Lincoln County development's water needs at full build out. The Proposed Action would allow delivery of the initial water supply appropriated by the LCWD within the Kane Spring Valley to the community. Additional water rights would be obtained by CSI developers from existing certificated rights owned by an affiliate of CSI further to the north in Lincoln County or new appropriations of groundwater in Lincoln County. CSI anticipates that this need being met in multiple phases by groundwater produced from various basins within Lincoln County rather than being identified at one time or produced from one location. The utilization of all such water rights within the community is and would be subject to the jurisdiction of an authorization by the Nevada State Engineer.

4.20.3.3.3 Coyote Springs 138 kV Transmission Line Project

In order to provide reliable electrical service to the CSI development, the LCPD is proposing to upgrade a portion of its existing transmission system from 69 kV to 138 kV and construct up to five new substations to accommodate the upgrade. Up to 11.2 miles of transmission line would be upgraded between the proposed Scott Substation to the proposed Sheep Mountain Substation. The proposed Scott Substation would be located on private property east of Highway 93 (within Lincoln County), approximately 5 miles south of the intersection of Kane Springs Road and Highway 93. The proposed Sheep Mountain Substation would be located on BLM-administered public land west of Highway 93. Ancillary facilities would include three additional substations, step-down transformers for fiber optic and cellular tower facilities and related electrical components. These facilities would be primarily located along Highway 168.

4.20.3.3.4 Ely Energy Center

Nevada Power Company, in conjunction with Sierra Pacific Power Company, has applied to the Public Utility Commission of Nevada to construct and operate a new coal-fired electrical generation facility and associated transmission, switching station and communication facilities.

These facilities would primarily be located on federal land administered by the BLM, Ely, Elko and Las Vegas Offices. A portion of the 500 kV transmission line, between the Robinson Summit Switching Station near Ely and the Harry Allen Switching Station northeast of the intersection of Highway 93 and I-15, is proposed to be constructed through the Delamar Valley to Kane Springs Valley and west along the Kane Springs Road within the 2,640-foot wide LCCRDA corridor to Highway 93. A separate EIS is being prepared for this project. Scoping meetings were held in February 2007.

4.20.3.3.5 Coyote Spring Well and Moapa Transmission System Project

The SNWA is proposing to develop its existing groundwater rights in Coyote Spring Valley Hydrographic Basin. The Nevada State Engineer has permitted 16,300 AFY of groundwater in Coyote Spring Valley, of which 9,000 acre-feet are owned by SNWA. The Coyote Spring Well and Moapa Transmission System Project (Coyote Spring Project) would develop and convey 9,000 AFY of groundwater from Coyote Spring Valley in northeastern Clark County using new and existing facilities. The final EA and Finding of No Significant Impact (FONSI) were issued for this project on June 22, 2007.

Development of groundwater resources for this project will first use existing permitted water rights. Additional water rights applications are pending and will be subject to Nevada State Engineer Order 1169, which relates to groundwater applications in several adjacent groundwater basins, including Coyote Spring Valley, and holds various permits in abeyance pending the completion of a study of the regional carbonate aquifer system. In addition to Coyote Spring Valley, Hydrographic Basins included in Order 1169 include Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs (aka Upper Moapa Valley) (Basin 219), and Lower Moapa Valley (Basin 220). While the California Wash (Basin 218) was not included in Order 1169 (March 2002), the Nevada State Engineer, in Ruling 5115 (April 2002), held applications in California Wash in abeyance pending completion of the Order 1169 study.

The Order 1169 requires major groundwater rights holders in the Coyote Spring Valley Basin to participate in a 5-year study to provide information on the effects of pumping existing permitted water rights in Coyote Spring Valley. As of December 2006, only about 4,600 AFY of the permitted 16,300 AFY of water rights in Coyote Spring Valley have been pumped. Order 1169 requires that at least 8,150 AFY (at least half of the permitted groundwater rights in Coyote Spring Valley) be pumped for at least 2 consecutive years. Funding is being provided by the Las Vegas Valley Water District, SNWA, CSI, Nevada Power Company and the Moapa Valley Water District.

In addition to the conservation measures that would be implemented by SNWA as part of the proposed action for the Coyote Spring Project, SNWA (in addition to CSI, USFWS, Moapa Band of Paiute Indians, and the Moapa Valley Water District) has entered into an MOA for the protection and recovery of the Moapa dace and its habitat. The following section outlines specific conservation measures described in the MOA. For a full listing, see **Appendix** A.

- Establishment by all parties of a Recovery Implementation Program for the protection and recovery of Moapa dace;

- Dedication by the Moapa Valley Water District of its entire 1.0 cfs Jones Spring water right to provide in-stream flows beneficial to Moapa dace;
- Both the USFWS and SNWA have agreed to provide funding in the amount of $125,000 to develop an ecological model for the Moapa dace; and SNWA agreed to provide funding in the amount of $50,000 to construct fish barriers for USFWS/SNWA in consultation with the other parties to the Stipulation;
- Construction of a set of fish barriers on the Muddy River by the BLM and the USFWS to prevent further migration of non-native fishes;
- Establishment of a Hydrologic Review Team by all parties;
- Operational coordination among the USFWS, SNWA, CSI and Moapa Valley Water District;
- Carrying out adaptive management measures by the parties including funding preparation and implementation of biological and hydrological studies and activities supporting recovery of Moapa dace; establishing a regional monitoring and management plan; assessing the feasibility of augmenting and restoring in-stream flows; and continuing to reevaluate necessary measures to protect and recover Moapa dace; and
- If flow levels, as measured at the Warm Springs West flume, reach 3.0 cfs during the Order 1169 pumping study, the Moapa Valley Water District would shut down the Arrow Canyon well.

4.20.3.3.6 Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project

The LCWD has submitted ROW applications for development of up to 15 production water wells to be located in the previously permitted Toquop Energy Project proposed well field area located in the Tule Desert Hydrographic Basin and up to 15 production water wells to be located in the Clover Valley Hydrographic Basin of southeastern Lincoln County. Collectively, wells in the Tule Desert basin would pump up to 9,340 AFY. Wells in the Clover Valley would pump up to 14,480 AFY. A system of pipelines would collect pumped water for conveyance through a main transmission pipeline southeast to the LCLA development area following, in part, the 2,640-foot wide LCCRDA corridor. Other utilities, including natural gas, telecommunications and electrical power, would be brought into the LCLA area along portions of the water pipeline alignment.

The existing Tule Desert well field is currently permitted to produce and export 2,100 AFY of groundwater. The LCWD has applications pending before the Nevada State Engineer for an additional 7,240 AFY in the Tule Desert Basin.

The BLM Ely District is preparing a separate EIS to identify and disclose the direct and indirect effects associated with this project. The decision about how much additional water would be permitted, if any, rests with the Nevada State Engineer.

4.20.3.3.7 Toquop Energy Project

Toquop Energy, LLC (a subsidiary of Sithe Global Power, LLC), a privately held, independent power company is proposing to construct a 750 megawatt (MW) coal-fired power plant in southeastern Lincoln County on lands administered by the BLM Ely District. The power plant would be constructed on the same site as and instead of a natural gas-fired power plant for which a ROW was approved by the BLM Ely District in April 2003. In April 2003, BLM Ely District Office issued a Final EIS for the Toquop Energy Project, proposed by Toquop Energy, Inc. The current EIS will assess the potential impacts of a ROW for the proposed coal-fired facility and a new railroad line to transport coal to the facility.

4.20.3.3.8 Additional Moapa Valley Water District Groundwater Pumping in Upper Moapa Valley

The Moapa Valley Water District's existing water right permit allows for phased increases in groundwater pumping from wells in the Upper Moapa Valley Hydrographic Basin (aka Muddy River Springs). Current pumping by the Moapa Valley Water District is approximately 2,400 AFY (up to 7,200 AFY are allowed). Similar to the Stipulation Agreement between the USFWS and the LCWD, Moapa Valley Water District has agreed to restrict groundwater pumping if the 2.7 cfs "trigger level" at the Warm Springs West flume is reached.

4.20.3.3.9 Clark, Lincoln, and White Pine Counties Groundwater Development Project

In August 2004, the SNWA filed an application with the BLM Ely District for ROWs for a proposed system of regional groundwater production, conveyance and treatment facilities and power conveyance facilities in Clark, Lincoln, and White Pine Counties. The proposed facilities include approximately 327 miles of pipeline, five pumping stations, six regulating tanks, a buried storage reservoir, a water treatment facility, 14 groundwater production wells, 349 miles of overhead power lines, eight electrical substations and four hydro-turbine energy recovery facilities (SNWA 2007). Portions of these project facilities (i.e., water transmission pipeline and electric transmission lines) would be located west of the Kane Springs Valley project area. The SNWA anticipates major facility construction between 2009 and 2014.

The proposed facilities would develop groundwater located in the following valleys: Spring, Snake, Cave, Dry Lake, Delamar and Coyote Spring. The SNWA holds water rights and applications for approximately 167,000 AFY in Spring, Snake, Cave, Dry Lake, Delamar and Coyote Spring Valleys. On April 16, 2007, the Nevada State Engineer approved a portion of SNWA's groundwater rights applications submitted for the Spring Valley in White Pine County, enabling the SNWA to develop a maximum of 60,000 AFY from the basin. The remaining applications are being adjudicated through the Nevada State Engineer's water rights process.

4.20.3.3.10 Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights

Nevada Power Company holds 2,500 AFY of existing permitted water rights in the Coyote Spring Valley Hydrographic Basin. Although these are existing permitted rights, Nevada Power has not identified any projects or proposals to develop these rights. Because there is no proposed project to develop these water rights, there is no information to analyze potential cumulative effects of project construction and operation. However, because these are existing permitted rights, the potential hydrologic effects of groundwater pumping are considered in the analysis of cumulative impacts to water resources.

4.20.3.3.11 Build-Out of the Lincoln County Land Act Area (Toquop Township Planning Area)

The LCLA of 2000 was finalized through provisions in the LCCRDA of 2004. In February 2005, the BLM sold 13,300 acres of land in eight parcels in southeastern Lincoln County for $47.5 million. The parcels varied in size from 666 to 4,257 acres. Lands are currently undeveloped but are being planned by Lincoln County as a Planned Unit Development referred to as the Toquop Township Planning Area (Lincoln County 2006). The Toquop Township Planning Area "will be developed in village settings to maximize the scenic attributes of the area, provide for a connected transportation system and become self sufficient through its provisions of services" (Lincoln County 2006).

Development and Conveyance Agreements among the developers and Lincoln County will require development plans outlining proposed uses of the acquired property. Preliminary build out density for the LCLA development area is expected at 3.3 dwellings per gross acre, for a total build out estimated at 44,000 dwelling units. The build out is expected to proceed over a 30-year period.

4.20.4 Cumulative Impacts Analysis

As described in Chapter 4.0 - Environmental Consequences, the Proposed Action would not impact the following resources: Geological Resources, Mineral Resources, Livestock Grazing, Transportation, Wilderness, Recreation, Air Quality, Noise, Environmental Justice, Hazardous and Solid Waste, Paleontological Resources, and Heritage Resources and Historical Properties. Therefore, there would be no cumulative impacts to these resources from the Proposed Action.

4.20.4.1 Soil Resources

The ROI for the cumulative resource analysis for soil resources is the area adjacent to the proposed ROW, nearby off-site areas subject to disturbance from the Proposed Action or Alternatives, and those areas beneath new facilities that would remain inaccessible for the life of the project. RFFAs evaluated for soil resources include the Proposed Action and future development in the northern portion of the CSI development area in Lincoln County; the proposed 500 kV transmission line associated with the Ely Energy Center; and future OHV use, livestock grazing, wildland fire, drought and flooding.

Past actions associated with OHV use, livestock grazing, wildland fire, drought, and flooding have caused impacts to the soils within the cumulative impact ROI. Construction activities occurring at the same time, and within the same drainage, have the potential to cumulatively increase the amount of disturbed land subject to erosion and sedimentation. However, impacts to soil resources from the Proposed Action and other RFFAs within the cumulative impacts ROI would be minimized by erosion and sediment control measures incorporated in their respective development designs and construction methods. Therefore, no cumulative impacts to soil resources would occur as a result of the Proposed Action.

4.20.4.2 Water Resources

The cumulative resource analysis area for water resources includes the following Hydrographic Basins: Kane Springs Valley (No. 206), Coyote Spring Valley (No. 210), and Muddy River Springs Area (No. 219) – See Map 3-2.

Cumulative impacts to water resources and hydrology are primarily related to groundwater withdrawals that could result in a decline in groundwater levels and flows at downgradient locations, specifically the Muddy Springs Area, which is a major regional discharge point for White River Flow System.

Global climate change as noted in section 4.20.3.1 could influence these effects; however there is no agreement from the scientific community on what these impacts may be.

RFFAs with potential effects on water resources and hydrology include the actions associated with the implementation of the LCCRDA including the Proposed Action; the Clark, Lincoln, and White Pine Counties Groundwater Development Project; the build out of the CSI development area and associated water rights development in southern Lincoln County; the Coyote Spring Project; pumping of existing undeveloped Coyote Spring Valley groundwater rights by the Nevada Power Company; and additional groundwater pumping by the Moapa Valley Water District in Upper Moapa Valley. **Table 4-7** summarizes existing water rights in the cumulative impacts area.

Table 4-7
Existing Water Rights and Applications in the Cumulative Impacts Area

Hydrographic Basin	Perennial Yield[1] (AFY)	NDWR Permitted Annual Duty[3] (AFY)
Kane Springs Valley	1,000[2]	1,000[2]
Coyote Spring Valley	18,000	16,304
Muddy River Springs	37,000	13,328

[1]NDWR 1992
[2] Nevada State Engineers Ruling 5712 February 2007 (NDWR 2007b)
[3] Permitted water rights reported as Annual Duty in AFY (NDWR 2007a)
AFY – acre-feet per year

Cumulative effects from existing permitted rights in combination with proposed future groundwater pumping have been evaluated within the last 5 years. All of these studies focused on impacts to reduced flow at the Muddy Springs area.

The SNWA, in conjunction with the Las Vegas Valley Water District, sponsored an analysis which included a portion of the Clark, Lincoln, and White Pine Counties Groundwater Development Project (up to 27,512 AFY in the Coyote Spring Valley Hydrographic Basin – still pending); the CSI development (4,600 AFY); the Nevada Power Company groundwater rights (2,500 AFY); and the Moapa Valley Water Districts pumping in Upper Moapa Valley (7,200 AFY). The cumulative analysis predicted a decline in the carbonate aquifer levels in the Muddy Springs area of less than 10 feet, and a decrease of about 4 cfs of flow from the Muddy Springs, after pumping over a 61-year period (LVVWD 2001).

Another model was developed by Department of Interior agencies (BLM, NPS and USFWS) and included the Coyote Spring Valley portion of the Clark, Lincoln, and White Pine Counties Groundwater Development Project (the pending applications for 27,512 AFY); the CSI development (4,600 AFY); and the Nevada Power Company groundwater rights (2,500 AFY). The cumulative analysis predicted a reduction in Muddy River stream flows of about 33 and 22 percent at the Moapa gauge and Muddy River Narrows, respectively, after pumping over a 50-year period (GeoTrans 2001).

The USFWS analyzed the potential cumulative effects of groundwater development of up to 16,100 AFY from Coyote Spring Valley and California Wash (USFWS 2006). This analysis predicted that, after 5 years of pumping, groundwater levels would decline about 8.5 feet, a possible loss of 31 percent of flow on the Pederson Unit, and an overall reduction in flow of the Moapa Valley Wildlife Refuge Area at its confluence with the Muddy River of 6 percent, compared to 1998 conditions (USFWS 2006).

No detailed cumulative effects modeling has been completed for the Proposed Action or other groundwater development projects in the ROI. The SNWA/LVVWD applications in Coyote Spring Valley would depend on the results of Order 1169 pumping study addressing effects on groundwater levels in Coyote Spring and Upper Moapa Valleys and spring flow of the Muddy Springs.

The Nevada State Engineer has granted the SNWA groundwater rights in Spring Valley, and SNWA has applications pending for Snake Valley. These basins are located in a separate flow system (Great Salt Lake Desert flow system); therefore, groundwater developments in those basins are not anticipated to have a cumulative affect on the Kane Springs Valley, Coyote Spring Valley or Muddy Springs Hydrographic Basins. Cumulative impacts of the Clark, Lincoln, and White Pine Counties Groundwater Development Project, in conjunction with existing permitted rights, would be analyzed in detail in the EIS being prepared for that project.

A large-scale modeling study by Schaefer and Harrill (1995) simulated effects of proposed groundwater pumping (180,800 AFY) on regional groundwater flow, as well as on large regional springs in 17 basins in east-central and southern Nevada. Analysis included pumping from the White River Flow System including Cave, Dry Lake, Delamar and Coyote Spring Valleys. No pumping was simulated within the Kane Springs Valley, but 5,000 AFY was extracted from the Coyote Spring Valley. The simulation of pumping in the carbonate-rock province of the Great Basin indicated that water levels, the flow of regional springs and groundwater discharge by evapotranspiration would be affected. They concluded that approximately 10 feet of drawdown in the deep carbonate aquifer would occur in the Coyote Spring area after 100 years of pumping. The simulations also showed that discharge from several regional springs could be affected. After about 100 years of simulation, flow from Muddy River Springs would be reduced by about 6 cfs (11 percent).

The SNWA, CSI and Moapa Valley Water District hold rights to withdraw up to 20,800 AFY from the Coyote Spring and Upper Moapa Valleys, which could cumulatively affect flow of the Muddy Springs. These potential effects are offset, however, by the conservation commitments from an MOA entered in April 2006 between these major groundwater right holders and USFWS (**Appendix A**). Similar to the Stipulation Agreement between the USFWS and the LCWD, the potential effects of groundwater production would be managed to protect instream flow levels, as measured at Warm Spring West flume (part of Muddy Springs). Groundwater pumping would have to be reduced or completely restricted if predetermined "trigger levels" are reached at Warm Spring West flume.

Based on the MOA, if water flows reach 3.0 cfs during the pump test, the MVWD shall cease pumping from the Arrow Canyon well, and SNWA will provide the MVWD with water quantity to meet their municipal demands. If water flows reach 3.0 cfs or less, SNWA and CSI will restrict groundwater pumping from wells identified in the MOA. At the 2.7 cfs or less trigger level, SNWA and CSI will restrict groundwater pumping from wells identified in the MOA, and the Moapa Band of Paiute Indians will restrict their pumping in California Wash.

Regardless of which groundwater development project or whether potential future climatic conditions are the source of effects, the commitments under the MOA require the reduction or cessation of pumping the groundwater rights which are the subject of the MOA if specified spring flow trigger levels are reached. The measures included in the MOA, including reductions in groundwater pumping and movement of groundwater production to locations more distant from the Muddy Springs, would also alleviate potential cumulative impacts of other more distant projects.

The LCWD groundwater development project in Tule Desert and Clover Valley Hydrographic Basins that would collectively pump up to 23,820 AFY would not contribute to cumulative impacts in conjunction with groundwater pumping under the Proposed Action. These two Hydrographic Basins are not part of the White River Flow System; therefore, groundwater development in these basins would not affect the flows at the Muddy River Springs. Additionally, The Nevada State Engineers Ruling 5181 (2002) requires additional study to estimate the amount of groundwater available from Tule Desert Groundwater Basin, recharge to the area, and the direction of groundwater flow. Groundwater modeling is currently being performed by the NPS to evaluate the regional flow systems in the area and to determine if cumulative pumping in the region would influence spring flows in the Virgin River Hydrographic Basin.

As discussed in the previous paragraphs, in the absence of conservation and mitigation measures, groundwater development in the cumulative impact area could potentially affect flow rates in the Muddy River System. However, several rulings and agreements were drafted to protect the flows at Muddy River Springs. These rulings are presented in **Appendices A and B** and include:

- Nevada State Engineer Order 1169 which relates to groundwater applications in several adjacent groundwater basins, including Coyote Spring Valley, and holds various permits in abeyance pending the completion of a study of the regional carbonate aquifer system. Order 1169 requires major groundwater rights holders in the Coyote Spring Valley Basin to participate in a 5-year study to provide information on the effects of pumping existing permitted water rights in Coyote Spring Valley. These right holders include the Las Vegas Valley Water District, SNWA, CSI, Nevada Power Company and the Moapa Valley Water District. Signatory agencies for Order 1169 include the BLM, Bureau of Indian Affairs, the USFWS and the NPS.

- Nevada State Engineer Order 5712 in which it was concluded that "there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs".
- The Stipulation Agreement between the LCWD and the USFWS agrees to cooperatively manage the development of the LCWD water rights in the Kane Springs Valley Hydrographic Basin including reduction or cessation of pumping if specified spring flow trigger levels at Muddy River Springs are reached.
- The MOA agreement among SNWA, CSI, Moapa Valley Water District and USFWS requires the reduction or cessation of pumping if specified spring flow trigger levels are reached.

Additionally, the LCWD would provide for BLM review of all monitoring flow data collected from the Muddy River Springs as identified in the Stipulation Agreement between the LCWD and the USFWS. The BLM would continue to coordinate with the LCWD and the USFWS to ensure that the Proposed Action would not adversely impact the flows at Muddy River Springs. The BLM would also identify and monitor any free-flowing springs in the Kane Springs Valley to confirm that no impacts to local springs would result from the Proposed Action.

4.20.4.3 Vegetation Resources

The cumulative resource analysis area for vegetation includes the Kane Springs Valley, Coyote Spring Valley, and the area adjacent to the Muddy River and associated springs. Ten of the 14 interrelated projects are located within the cumulative resource analysis area (**Table 4-4**). Cumulative impacts on vegetation resources are generally additive and proportionate to the amount of ground disturbance within specific habitat areas.

Construction of the interrelated projects analyzed in this EIS would result in the loss of native vegetation, potential loss of special status species, and the increased potential for the spread of invasive and noxious weeds. For projects located on federal lands, specific mitigation measures to minimize these impacts would be a requirement of their approval. Projects located on private lands would be subject to either the approved Lincoln County Habitat Conservation Plan (Lincoln County 2006) or the CSI MSHCP.

Cumulative impacts of groundwater pumping on vegetation resources include potential impacts to riparian vegetation in the Muddy Springs area. These potential effects are minimized, however, by the monitoring and mitigation commitments, such as the LCWD Stipulation Agreement with the USFWS, and others described in Section 4.20.4.2 – Water Resources. While the BLM does not have the authority to mandate certain monitoring and mitigation strategies, they would work collaboratively with other agencies under existing agreements to ensure the there would be no cumulative impacts on vegetation resources from the Proposed Action or that actions would be taken to minimize/mitigate cumulative impacts.

Both Lincoln County and the developers of the CSI development area are preparing separate Habitat Conservation Plans that would address cumulative effects on biological resources for development and construction activities within Lincoln County and CSI lands. The Southeastern

Lincoln County Habitat Conservation Plan and the CSI 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 impact the biological viability of the region.

4.20.4.4 Wildlife Resources

The cumulative resource analysis area for wildlife resources (with the exception of the desert tortoise) includes the Kane Springs Valley, Coyote Spring Valley, and the area adjacent to the Muddy River and associated springs. Ten of the 14 interrelated projects are located within cumulative resource analysis area (**Table 4-4**). As described in the previous section, cumulative impacts on biological resources are generally additive and proportionate to the amount of ground disturbance within specific habitat areas. The Lincoln County Habitat Conservation Plan and CSI MSHCP would address sensitive and protected wildlife resources on private and public lands in Lincoln County.

Potential cumulative impacts from construction of interrelated projects analyzed in this EIS include loss and fragmentation of wildlife habitat and disturbance to special status wildlife species. Because impacts to sensitive biological resources are regulated by the USFWS, NDOW and other resource management agencies, potential impacts resulting from project development would require consultation with responsible agencies and implementation of mitigation measures. The evaluation of project impacts would take into account the cumulative nature of impacts to wildlife resources through loss of habitat, severance of wildlife corridors and disturbance by human activities. Implementation of mitigation measures for impacts to these resources would be required for each project as a condition of approval. Specific estimates of impact acreages to wildlife species resulting from cumulative actions within the cumulative resource analysis area would be greater than those for the desert tortoise (Table 4.8) because the cumulative resource area is larger for wildlife resources.

The following section addresses potential cumulative impacts to sensitive species known to occur in the cumulative resource analysis area.

4.20.4.4.1 Desert Tortoise

The cumulative resource analysis area for the desert tortoise is the Mormon Mesa Critical Habitat Unit. Interrelated projects that could have cumulative effects on desert tortoise include those which would be developed within desert tortoise critical habitat, which includes portions of southern Lincoln County and northern Clark County. Ten of the 14 interrelated projects are located within the Mormon Mesa Critical Habitat Unit (Table 4-4). 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 (BLM, USFWS NDOW) to implement site-specific desert tortoise protection measures. For projects on federal lands, any disturbance would be required to undergo consultation under Section 7 of the ESA. Projects on private lands would undergo Section 10 or Section 7 consultation as appropriate. Specific acreages of impact to desert tortoise critical habitat resulting from cumulative actions within the Mormon Mesa Critical Habitat Unit are estimated in Table 4.8.

Table 4.8
Acres Disturbed or to be Disturbed of Desert Tortoise Critical Habitat within the Mormon Mesa Critical Habitat Unit (Cumulative Resource Analysis Area)

Project	Desert Tortoise Habitat Disturbed (Acres)
Lincoln County Conservation, Recreation, Development Act	Unknown
Coyote Spring Development – Lincoln County	29,002 acres[1]
Coyote Spring Development – Clark County	6,881 acres[1]
LS Power Electrical Transmission Project	Unknown
Coyote Springs 138-kV Transmission Line Project	165.5 acres of permanent disturbance and 125.1 acres of temporary disturbance
Coyote Spring Well and Moapa Transmission System Project	121.7 acres
Ely Energy Center Project (500 kV transmission line in the designated LCCRDA corridor)	Unknown
Additional Moapa Valley Water District Groundwater Pumping in Upper Moapa Valley	Unknown
Clark, Lincoln, and White Pine Counties Groundwater Development Project	Unknown
Pumping of Other Existing Undeveloped Coyote Spring Valley Groundwater Rights	Unknown
Total	**Greater than 36,170 acres of desert tortoise designated critical habitat disturbed in the Mormon Mesa Critical Habitat Unit**

[1] USFWS 2007b

4.20.4.4.2 Special Status Species

Construction of the interrelated projects analyzed in this EIS would result in the loss of habitat occupied by special status species including the western burrowing owl, the banded Gila monster and the chuckwalla. Cumulative loss of wildlife habitat in the region would affect the special status species that utilize that habitat. For projects located on federal lands, specific mitigation measures to minimize these impacts would be a requirement of their approval. Projects located on private lands would be subject to either the Southeastern Lincoln County Habitat Conservation Plan or CSI MSHCP.

Cumulative groundwater pumping could affect habitat for special status fish and aquatic species or special status species that rely on riparian habitats in the Muddy Springs area. These potential effects are offset, however, by the conservation commitments, such as the LCWD Stipulation Agreement with the USFWS, and others described in Section 4.20.4.2 – Water Resources. While the BLM does not have the authority to mandate certain monitoring and mitigation strategies, they would work collaboratively with other agencies under existing agreements to ensure there would be no cumulative impacts from the Proposed Action. The cumulative effect of these projects should be no greater than the individual effect of the Proposed Action. The conservation measures identified under the MOA for the Moapa dace, including the additional flows from the dedication of the Jones Spring water right and the restoration of habitat, would improve habitat conditions for these species.

4.20.4.4.3 Migratory Birds

Construction of the interrelated projects analyzed in this EIS has the potential to disturb or destroy migratory bird nests and fledglings. In addition, the proliferation of overhead transmission lines in the region increases the potential for transmission line collisions and electrocution to migratory birds. For projects located on federal lands, specific mitigation measures to minimize these impacts would be a requirement of their approval. Projects located on private lands would be subject to either the Southeastern Lincoln County Habitat Conservation Plan or CSI MSHCP.

4.20.4.5 Land Use

The cumulative resource ROI for land use is the southern portion of Lincoln County from Alamo to the southern extent of the CSI development area, which extends to SR 168 in Clark County, and the LCLA area. RFFAs evaluated for land use include the LCCRDA, CSI development in Lincoln and northern Clark Counties, the sale and build out of the Alamo land disposal area, the build out of the LCLA area in southeastern Lincoln County, the transmission line projects proposed to be constructed within the permitted SWIP corridor, and the 500 kV transmission line associated with the Ely Energy Center.

Because most private lands within Lincoln County are located adjacent to or near federal lands, it is anticipated that future development would likely affect land use on both private and public lands. Approximately 29,000 acres of privately owned land would be converted from uninhabited desert space to multi-use residential/commercial uses in the CSI area. The LCLA development area would convert approximately 13,000 acres of privately owned land with similar habitat to multi-use residential/commercial uses in southeastern Lincoln County. Both the CSI and LCLA developments are expected to occur over a 30- to 50-year period. Nearly 850 acres near Alamo would be converted to residential/commercial as early as 2008.

The electric transmission projects proposed by LS Energy, LCPD and the SNWA within the permitted SWIP corridor, in addition to the electric transmission projects within the 2,640-foot wide LCCRDA along Kane Springs Road, would increase the density of utility-related land use in the area. Collectively, these projects would have a cumulative impact on future land use in Lincoln County. Increased population and economic growth would likely result in an increased number of projects on adjacent federal lands including water development projects, recreation and non-recreation special uses, utility corridors and infrastructure, road improvements, travel management plans, rangeland management and grazing, and additional recreation/tourism facilities. Any future action on federal land would require compliance with applicable federal laws and regulations.

Lincoln County planning agencies, in cooperation with federal resource managers (e.g., BLM, USFWS, Army Corps of Engineers) and newly formed municipal agencies (e.g., CSI GID, LCLA GIDs), would be responsible for long-range planning of future development and resource management within Lincoln County.

4.20.4.6 Areas of Critical Environmental Concern

The cumulative impact analysis area for ACECs includes the Kane Springs ACEC. Cumulative impacts to ACECs would occur from the Proposed Action and other planned projects within the ACEC. These RFFAs include the actions associated with the implementation of the LCCRDA including the Proposed Action, the Clark, Lincoln, and White Pine Counties Groundwater Development Project, the construction of the 500 kV transmission line associated with the Ely

Energy Center, the build out of the CSI development in Lincoln County, and the LS Power transmission line in the SWIP corridor.

The Kane Springs ACEC currently contains 65,900 acres of public lands. The primary resource value of the ACEC is the protection of desert tortoise critical habitat. As described in section 4.20.4.4 – Wildlife Resources, the interrelated projects would have a cumulative effect on desert tortoise and their habitat. All development activities within the ACEC require consultation with resource management agencies including the BLM, USFWS, NDOW, Lincoln County Planning Department and the local GID to implement site-specific desert tortoise protection measures in their development plans. For projects on federal lands, any disturbance would be required to undergo consultation under Section 7 or Section 10 of the ESA and implement reasonable and prudent measures to minimize take of desert tortoise.

4.20.4.7 Visual Resources

The cumulative impact ROI includes the project area and areas that would be affected by the Proposed Action or Alternative 1 that would be visible from off-site viewpoints. Potential cumulative impacts to visual resources would result from other planned or foreseeable development activities which are planned to occur within the ROI.

Historically, the project area has been managed for grazing and recreational use. Other management activities that have occurred within the ROI include road construction, water development facilities, power lines and utility corridors (water and gas lines). Concurrent management activities, which are taking place at the present time, are a continuation of existing uses.

The RFFAs that would be located in the cumulative impacts ROI include a 500 kV transmission line proposed by Nevada Power along Kane Springs Road (Ely Energy Center Project), five electric transmission projects, and one water pipeline project along the permitted SWIP corridor west of Highway 93. If approved, the 500 kV transmission line proposed by Nevada Power would be located with the 2,640-foot wide LCCRDA corridor and would be the dominant human element within the corridor once it has been installed. The cumulative effect of these projects would be an increase in the number of electric transmission facilities that are visible from Highway 93.

The LCCRDA corridor is located on lands managed under the BLM VRM Class III. The objective of VRM Class III is to provide for management activities that may contrast with the basic landscape elements but remain subordinate to the existing landscape character. The nearby Delamar Mountains and Meadow Valley Range Wildernesses are managed under VRM Class I objectives.

With the passage of the LCCRDA, the VRM Class has changed to VRM Class IV. VRM Class IV objectives provide for management activities which require major modification of the existing character of the landscape. The Proposed Action, in addition to RFFAs within the cumulative impact ROI, would increase the visual impacts within the project area. Design and visual impacts of future development activities within the cumulative impact ROI would be regulated by the BLM on federal lands and Lincoln County or the local GID on private lands.

4.20.4.8 Socioeconomics

The cumulative impact ROI for social and economic resources encompasses Lincoln and Clark Counties.

The cumulative effects of past, ongoing and reasonably foreseeable future activities in and near communities to the social and economic structure of Lincoln and Clark Counties would be substantial; more so for Lincoln County than Clark County because Lincoln County's population is so small compared to that of Clark County. Some social conflict and lifestyle changes are unavoidable as the long-term residential and commercial developments expand over much of the available private land in the counties. Construction and operation of the Proposed Action or Alternative 1 would supply a small, but initially substantial, portion of the total water requirements for the CSI development projects in Lincoln County. Development of CSI does not depend on the Proposed Action because CSI has its own permitted groundwater rights, and it would be constructed regardless of the approval of the Proposed Action. The indirect effect of the withdrawal and transport of groundwater by itself would not have growth-inducing effects and other effects related to induced changes in the pattern of land use, changes to population density or growth rate. There would be no cumulative effects from construction, operation and maintenance of the Proposed Action when combined with other past, present and reasonably foreseeable future actions because those effects would occur with or without Proposed Action. The Proposed Action would have no additive and significant relationship to those effects.

Other planned and foreseeable projects with a potential effect to the social and economic structure of Lincoln and Clark Counties are being developed in response to the rapidly growing population and economy of Las Vegas and the surrounding metropolitan area. Community services and infrastructure would need to be increased as a result of ongoing residential and commercial development in the region to keep pace with the growing population and economy of the area.

4.20.5 Other Actions Not Analyzed

The Draft RMP/EIS for the Ely District describes construction of a road from Caliente to Mesquite and paving of Kane Springs Road as RFFAs. There are multiple dirt roads between Caliente and Mesquite. These roads, along with the Kane Spring Road, are located on lands managed by both the BLM and Lincoln County. According to the Lincoln County Planning Department, the county has not allocated funds, nor do they anticipate future funding for these actions (Dixon 2006). There is anecdotal discussion about widening of Highway 93 between I-15 and Ely; however, at this time, the NDOT has not included this action in any regional transportation plan.

5.0 CONSULTATION AND COORDINATION

This chapter describes the consultation and coordination activities the BLM has carried out with interested agencies, organizations and individuals while preparing the Draft and Final EIS. The NEPA and CEQ regulations require the public's involvement in the decision-making process as well as allowing for full environmental disclosure. Guidance for implementing public involvement is outlined in Title 43 CFR, Part 1610.2.

During the early phases of the scoping process, the BLM determined that an EIS would be required to comply with NEPA prior to taking action on the LCWD's ROW application. An EIS is the most detailed and complex of NEPA documents, and it includes requirements for significant public coordination and involvement throughout its preparation and review. NEPA and CEQ require the BLM to identify any potential environmental impacts associated with the Proposed Action so the BLM can consider them when making its final decision.

5.1 PUBLIC INVOLVEMENT PROCESS

Public involvement in the EIS process includes the steps necessary to identify and address public concerns and needs. The public involvement process assists agencies in: (1) broadening the information base for decision-making, (2) informing the public about Proposed Actions and potential long-term impacts that could result from implementation of the Proposed Action, and (3) ensuring that public needs are understood by the agencies. Public participation in the EIS process is required by NEPA at four specific points: 1) issue scoping, 2) review of the Draft EIS, 3) review of the Final EIS, and 4) receipt of the Records of Decision.

Scoping: The public was provided a 30-day scoping period to disclose potential issues and concerns associated with the Proposed Action. The BLM collected stakeholder comments at public meetings as well as comments sent via fax or mail. Six public meetings were held during the public comment period. These meetings were held in mid-April, 2006 in Caliente, Alamo, Mesquite, Las Vegas, Reno and Baker with a total attendance among all meetings of 70 people. The scoping period ended on May 1, 2006. Information obtained by the agencies during public scoping was combined with issues identified by the BLM and forms the scope of this EIS.

Draft EIS Review: The 60-day comment period for public review of the Draft EIS began with the publication of the Notice of Availability in the Federal Register on June 22, 2007. The BLM distributed press releases announcing the dates, locations, and times of the public meetings to local and regional print and broadcast media. The Draft EIS was distributed to individuals and agencies who requested copies (see Chapter 5.3), and posted on the BLM's website at www.blm.gov/nv/st/en/prog/planning/groundwater_projects. Four public meetings were held during the public comment period (June 22 to August 20, 2007) to receive comments on the Draft EIS. Dates and locations of these meetings, and the number of attendees, are as follows:

Carson City, Nevada - 0 Attendees
Date: July 30, 2007
Time: 4:00 – 6:00 p.m.
Location: Plaza Hotel

Pioche, Nevada – 1 Attendee
Date: July 31, 2007
Time: 6:00 – 8:00 p.m.
Location: Pioche Town Hall

Alamo, Nevada – 3 Attendees
Date: August 1, 2007
Time: 6:00 – 8:00 p.m.
Location: Alamo Ambulance Barn

Las Vegas, Nevada – 10 Attendees
Date: August 2, 2007
Time: 6:00 – 8:00 p.m.
Location: Atrium Suite Hotel

During the 60-day public comment period, the BLM received 19 comment documents (e.g. letters, emails, faxes) from individuals, private companies, and federal and state agencies commenting on the Draft EIS. A list of comment documents received, the content of each letter, and BLM's responses to comments are contained in Appendix F of the Final EIS. Each comment letter was assigned a reference number, and each comment was identified with a number. The BLM's responses are listed next to the comment. Where appropriate, changes and additions, are reflected in the Final EIS to respond to comments.

Final EIS Review: This Final EIS has been distributed with the publication of the Notice of Availability in the Federal Register. Copies of this Final EIS have been distributed to those parties requesting the Draft EIS including those entities listed in Chapter 5.3. In addition, the Final EIS has been posted on the BLM website.

5.2 FORMAL CONSULTATION WITH INTERESTED AGENCIES

Federal and state agencies were contacted individually to gather input for preparation of the EIS. Other resource management agencies were consulted at the federal and state levels to identify common concerns related to the Proposed Action or Alternatives. Cooperating agencies on this EIS include the USFWS, the NDOW and the Moapa Valley Water District. In addition, the USGS has provided technical guidance related to water resources issues.

A Biological Assessment has been prepared for the Proposed Action and submitted to the USFWS as required by Section 7 of the ESA (1973). A species list was requested from the USFWS at the beginning of EIS development. The species list identified any plant and wildlife species listed as Threatened, Endangered or Candidate species within the project area. At the request of the USFWS, rare plant and desert tortoise surveys have been conducted within the project area. The BLM will continue to coordinate with the USFWS throughout the EIS process.

The BLM consulted with Native American Tribes that claim ancestral ties to, or traditional culture use of, project area lands. In March 2006, BLM mailed copies of an "interested parties" letter under the NEPA guidance, to the following Tribal groups:

- Moapa Band of Paiutes
- Paiute Indian Tribe of Utah
- Las Vegas Paiute Tribe
- Kaibab Paiute Tribe (Arizona)
- Yomba Shoshone Tribe
- Ely Shoshone Tribe
- Duckwater Shoshone Tribe
- Shoshone Paiute Business Council

The consultation letter briefly described the Proposed Action and requested 1) Tribal input regarding any concerns about traditional cultural practices or other issues that might be affected by the Proposed Action, 2) information on how they would like to be involved in the planning process, 3) names of other individuals or organizations that should be notified or consulted about the project, and 4) an invitation to the Tribal Coordination Meeting at the BLM Ely District Office, Ely, Nevada, on May 18, 2006. A copy of the NOI, a map of the project area, and a brief description of the preliminary issues to be considered in the plan was enclosed with each of these letters.

The BLM received responses to this request from three Tribes: Las Vegas Paiute Tribe, the Paiute Tribe of Utah, and the Ely Shoshone Tribe. The Las Vegas Paiute Tribe did not provide input regarding any concerns about the Proposed Action, but wished to be kept informed of the project; the Paiute Indian Tribe of Utah had no interest in the project; and the Ely Shoshone Tribe wished to continue consultations for the Proposed Action directly with the BLM.

On May 18, 2006, representatives from the Ely Shoshone Tribe and the Duckwater Shoshone Tribe attended a Tribal Coordination Meeting at the BLM Ely District Office in Ely, Nevada. Information about the Proposed Action was presented to Tribal representatives. The Ely Shoshone Tribe and the Duckwater Shoshone Tribe expressed their concerns and interest in continued consultation regarding the Proposed Action.

In a further effort to elicit Tribal issues and concerns, the Moapa Band of Paiutes and the Las Vegas Paiute Tribe were invited by the BLM to visit the project area in person. This visit occurred on November 30, 2006. Representatives from the Moapa Band of Paiutes indicated they would submit written comments to the BLM expressing their concerns and interest in continued consultation regarding the Proposed Action. As of the writing of this Final EIS, the BLM has received no formal responses from the Moapa Band of Paiutes or Las Vegas Paiute Tribe following the site visit. There are no known effects to the integrity of resources of concern or interest to the Tribes in the area or any specific expressions of concern for the Proposed Action. The Draft and Final EIS were provided to each of the aforementioned interested Tribes for review and comment.

5.3 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE EIS WERE SENT

This section lists the agencies, officials and other interested parties who received copies of the Draft and Final EIS. The BLM filed copies with the EPA, who publishes a Notice of Availability of the EIS in the Federal Register. The BLM also distributed paper and electronic (on CD-ROM) copies to federal agencies, key state agencies, elected officials, local libraries and other requesting parties. The BLM will provide copies to other interested organizations or individuals on request.

5.3.1 Federal Government

U.S. Department of Agriculture – Natural Resources Conservation Service
U.S. Army Corps of Engineers – St. George Regulatory Office
U.S. Department of Energy
U.S. Environmental Protection Agency
U.S. Department of the Interior – Bureau of Indian Affairs
U.S. Department of the Interior – National Park Service
U.S. Department of the Interior – U.S. Fish and Wildlife Service
U.S. Department of the Interior – U.S. Geological Survey
Nellis Air Force Base

5.3.2 State Government

Nevada Bureau of Mines
Nevada Department of Agriculture
Nevada Department of Transportation
Nevada Division of Energy
Nevada Division of Environmental Protection
Nevada Division of State Lands
Nevada Division of State Parks
Nevada Division of Water Resources
Nevada Department of Wildlife
Nevada Office of the Governor
Nevada State Clearinghouse
Nevada State Historic Preservation Office
Nevada Department of Conservation
Nevada Natural Heritage Program
Nevada Division of Forestry

5.3.3 Local Governments

Lincoln County
Clark County
White Pine County
Nye County

5.3.4 Tribal Governments

Duckwater Shoshone Tribe
Ely Shoshone Tribe
Kaibab Paiute Tribe (Arizona)
Las Vegas Paiute Tribe
Moapa Band of Paiutes
Paiute Indian Tribe of Utah
Shoshone Paiute Business Council
Yomba Shoshone Tribe

5.3.5 Other Organizations

Center for Biological Diversity
Friends of Nevada Wilderness
Nevada Bighorn Unlimited
Sierra Club
Southern Nevada Water Authority
The Nature Conservancy
Natural Resource Defense Council
Wild Utah Project
Western Environmental Law Center
Desert Research Institute
Trout Unlimited
American Lands Alliance
Eastern Nevada Landscape Coalition
Audubon Society

5.3.6 Elected Government Officials

State of Nevada Governor, Jim Gibbons
Jon Porter, U.S. House of Representatives
Shelly Berkley, U.S. House of Representatives
Dean Heller, U.S. House of Representatives
John Ensign, U.S. Senate
Harry M. Reid, U.S. Senate

5.3.7 Availability

Copies of the Kane Springs Valley Groundwater Development Project Draft and Final EIS's were provided to the following public libraries and the BLM offices for public inspection.

Lincoln County – Alamo Branch Library
100 North 1st Street
Alamo, Nevada 89001

Lincoln County Library
93 Main Street
Pioche, Nevada 89043

Lincoln County – Caliente Branch Library
100 Depot Avenue
Caliente, Nevada 89008

White Pine County Library
950 Campton Street
Ely, Nevada 89301

BLM, Ely District Office
702 North Industrial Way
Ely, Nevada 89301-9408

BLM, Nevada State Office
1340 Financial Blvd
Reno, Nevada 89502-7147

BLM, Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

BLM – Caliente Field Office
U.S. Highway 93, Building #1
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5.4 LIST OF PREPARERS

BLM CORE INTERDISPLINARY TEAM AND TECHNICAL SPECIALITY

BLM – Nevada State Office

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- Amy Lueders – Associate State Director
- Penny Woods – Nevada Groundwater Project Manager
- Dan Netcher – Deputy Project Manager
- JoLynn Worley – Public Affairs
- Jim Paugh (contractor) – Rights-of-Way
- Robert (Bob) Boyd – Water Resources
- Kim Dow – Contract Administration

BLM – Ely District Office

- John Ruhs –Decision-Maker
- Jared Bybee –Wild Horses
- Dave Jeppeson – Wilderness, Visual Resource Management, Recreation
- Elvis Wall – Tribal Liaison
- Bonnie Waggoner – Noxious Weeds
- Kari Harrison – Soils and Vegetation

BLM – Caliente Field Station

- Ron Clementsen – Management Oversight
- Lynn Wulf – Cultural Resources
- Troy Grooms – Range Management

Nevada Department of Wildlife (Cooperating Agency)

- Brad Hardenbrook – Supervisory Biologist, Habitat Bureau
- Roddy Shepard – Habitat Biologist
- Craig Stevenson – Habitat Biologist

U.S. Fish and Wildlife Service (Cooperating Agency)

- Annalaura Averill-Murray – Fish and Wildlife Biologist
- Jeri Krueger – Fish and Wildlife Biologist

Moapa Valley Water District (Cooperating Agency)

- Brad Huza – General Manager

Lincoln County Water District

- Ronda Hornbeck – Financial Contract Oversight
- Mike Baughman, PhD – President, Intertech Services Corp., Consultant to the LCWD
- Dylan Frehner – General Manager/General Counsel

Vidler Water Company

- Donald A. Pattalock – Vice President, Project Manager
- Greg Bushner – Chief Hydrologist, Water Resources
- Jim Hutchins, PhD – Project Scientist, Cultural Resources

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Water Resources	Dr. Peter Kroopnick, RG, PH Phoenix, AZ	PhD Earth Science 35 years experience
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Visual Resources	Lisa Welch Denver, CO	B.S. Earth Science 14 years experience
Air Resources, Noise	Gordon Frisbie Denver, CO	M.S. Environmental Engineer B.S. Wildlife and Fisheries 18 years experience
Water Resources, Geology	Jacqueline Headrick Denver, CO	M.S. Geology 14 years of experience
Wildlife Resources, T&E Species	Mark Gillilan Denver, CO	B.A. Biology 4 years experience
Vegetation Resources, T&E Species	Corey O'Brien Denver, CO	B.A. Biology 4 years experience
ACECs / Wilderness / Land Use / Recreation	Kathryn Cloutier Denver, CO	M.S. Environmental Management B.A. Biology 19 years experience
Range Resources / Soils	Selina Koler Boulder, CO	M.S. Restoration Ecology B.S. Natural Resource Management 4 years experience
Transportation / Hazardous and Solid Waste	Susan Riggs, Boulder, CO	M.S. Environmental Science B.S. Field Biology 14 years experience
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Access (road)	Road used for passage to project sites and along utility corridors for purposes of construction, operation, and maintenance.
Acre-foot	The volume of water required to cover one acre to a depth of one foot: 43,560 cubic feet, 325,851 U.S. gallons, or 1,233 cubic meters.
Advisory Council on Historic Preservation	A 19-member body appointed to advise the President and Congress in the coordination of actions by federal agencies on matters relating to historic preservation.
Aeolian	Of or caused by the wind; wind-blown.
Aesthetic quality	Referring to the perception of beauty of a natural or cultural landscape.
Affected environment	Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.
Air quality	Measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.
Air quality classes	Classifications established under the Prevention of Significant Deterioration portion of the Clean Air Act that limit the amount of air pollution considered significant within an area. Class I applies to areas where almost any change in air quality would be significant; Class II applies to areas where the deterioration normally accompanying moderate well-controlled growth would be permitted; and Class III applies to areas where industrial deterioration would generally be allowed.
Air Quality Standards	The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.
Alkaline	Having a pH value greater than 7.
Alluvial fan	Cone-shaped deposits of alluvium made by a stream. Fans generally form where streams emerge from mountains onto the lowland.
Alluvial, alluvium	Relating to material deposited by running water, such as clay, silt, sand, and gravel. Sedimentary material transported and deposited by the action of flowing water.

Alluvium	A geologic term describing beds of sand, gravel, silt, and clay deposited by flowing water.
Alternative (action)	An option for meeting the stated purpose and need.
Ambient	The surrounding natural conditions (or environment) in a given place and time.
Animal Unit Month (AUM)	The amount of forage necessary for the sustenance of one cow or its equivalent (one cow, bull, steer, heifer, horse, burro, mule, five sheep, or five goats over the age of 6 months at the time of entering the public lands or other lands administered by BLM) for a period of 1 month.
Applicant	Lincoln County Water District
Aquatic	Growing or living in or near the water.
Aquifer	A water bearing formation that provides a ground water reservoir; a formation, a group of formations, or part of a formation that contains sufficient permeable material capable of yielding significant quantities of water to wells and springs.
Archaeology	The scientific study of the life and culture of ancient peoples, as by excavation of ancient cities, relics, or artifacts.
Area of Critical Environmental Concern	A BLM designation for an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources, or other natural systems or processes; or to protect life from natural hazards.
Artifact	Any object showing human workmanship or modification, especially from a prehistoric or historic culture.
Artifact Scatters (Historic)	Historic artifact scatters are a common type of site and include individual artifacts that may or may not include features. Artifacts include a variety of glass, ceramics, porcelain, and metal fragments.
Artifact Scatters (Prehistoric)	Artifact scatters commonly include chipped and ground stone debitage and possibly ceramics. Artifact scatters are the most common prehistoric sites. These sites are invaluable for data on interpreting subsistence strategies, settlement patterns, trade, and chronology.

Assessment (environmental)	An evaluation of existing resources and potential impacts on them from a proposed act or change to the environment.
Basaltic	Composed of, containing, or characteristic of basalt (the dark, dense igneous rock of a lava flow or minor intrusion, composed essentially of labradorite and pyroxene and often displaying a columnar structure).
Basic	Of or relating to a base; Containing a base, especially in excess of acid; Alkaline.
Burials	Burials refers to human inhumations may occur away from habitation sites in isolated areas such as rocky outcrops, talus slopes, crevices, caves, and under ledges.
Calcareous	Composed of, containing, or characteristic of calcium carbonate, calcium, or limestone; chalky.
Caldera	Volcanic feature formed by the collapse of land following a volcanic eruption.
Caliche Cave	Small cave, generally used by desert tortoise and other small reptiles and mammals, formed in calcium carbonate crust that forms on stony soils in arid regions.
Cambrian	The earliest geologic period in the Paleozoic Era, spanning the time of 570 to 500 million years ago, and marked by a profusion of marine animals.
Campsites (Prehistoric)	These sites represent a short-term occupation that may have occurred to procure food or raw material. Typically, these sites consist of chipped and ground stone debitage, and possibly ceramics. Fire pits or burned areas are common features associated with these sites.
Candidate species	A plant or animal species not yet officially listed as threatened or endangered, but which is undergoing status review by the USFWS.
Capture	Water withdrawn artificially from an aquifer is derived from a decrease in storage in the aquifer, a reduction in the previous discharge from the aquifer, an increase in the recharge, or a combination of these changes. The decrease in discharge plus the increase in recharge is termed capture.

Carbonate rock	Most carbonate rocks originate as sedimentary deposits in marine environments. Compaction, cementation, and dolomitization processes act on the deposits as they lithify and greatly change their porosity and permeability. The principal postdepositional change in carbonate rocks is the dissolution of part of the rock by circulating slightly acidic ground water. Solution openings in carbonate rocks range from small tubes and widened joints to caverns that may be tens of meters wide and hundreds to thousands of meters in length. Where they are saturated, carbonate rocks with well-connected networks of solution openings yield large amounts of water to wells that penetrate the openings (see carbonate aquifer), although the undissolved rock between the large openings may be almost impermeable.
Carbonate aquifer	Most carbonate-rock aquifers consist of limestone, but dolomite and marble locally yield water. The water-yielding properties of carbonate rocks vary widely; some yield almost no water and are considered to be confining units, whereas others are among the most productive aquifers known.
Clastic Rocks	Rocks formed by fragments of pre-existing rocks
Clay lens	A soil mantle consisting of a layer of clay of variable thickness.
Clean Water Act	Provides for pollution control activities and funding at the federal level including grant programs, research and related programs, as well as provisions for setting standards and enforcement actions.
Cone of Depression	A depression in the water table or potentiometric surface of a ground water body that is in the shape of an inverted cone and develops around a well which is being pumped. It defines the area of influence of the pumping well.
Cooperating agency	Any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. The selection and responsibilities of a cooperating agency are described in 40 CFR 1501.6. A State or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency become a cooperating agency.
Council on Environmental Quality	An advisory council to the President established by Title II of the National Environmental Policy Act of 1969. It reviews federal programs for their effort on the environment studies, and advises the President on environmental matters.

Cryptobiotic	Of or related to the state of cryptobiosis (a state in which an animal's metabolic activities come to a reversible standstill).
Cubic feet per second	Unit of discharge, or volume rate of flow, equal to 0.0283 cubic meters per second. As a rate of streamflow, a cubic foot of water passing a referenced section in 1 second. A measure of a moving volume of water (1 cfs = 0.0283 m3/s).
Cultural resources	A broad, general term meaning any cultural property reflecting past human activity or use that has a definite location, and any traditional lifeway value important to a contemporary social and/or cultural group's traditional systems of religious belief, cultural practices, or social interaction.
Cumulative impact	The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions—regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).
Deuterium	Also called heavy hydrogen, is a stable (non radioactive) isotope of hydrogen with a natural abundance in the oceans of Earth of approximately one atom in 6500 of hydrogen. Measurements of small variations in the natural abundances of deuterium, along with those of the stable heavy oxygen isotopes 17O and 18O, are of importance in hydrology, to trace the origin of Earth's waters. The heavy isotopes of hydrogen and oxygen in rainwater are enriched as a function of the environmental temperature of the region in which the precipitation falls. Evaporative and other processes in water also alter the ratios of heavy hydrogen and oxygen isotopes in characteristic ways. For example, precipitation falling in areas with lower temperatures or at higher latitudes will tend to have lower deuterium values. On the other hand, water from springs originating from deep regional aquifer systems would have different deuterium values due to different geographical origin as well as geochemical processes acting along its path.
Direct effect	See effects.
Draft Environmental Impact Statement	A detailed written statement as required by Section 102(2)(c) of NEPA.
Drawdown	The vertical distance the free water elevation is lowered, or the reduction of the pressure head due the removal of free water.

Effects	(a) Direct effects, which are caused by the action and occur at the same time and place; (b) Indirect effects, which are caused by the action and are later in time or farther time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effects and impacts as used in [the CEQ] regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.
Endangered species	Any species in danger of extinction throughout all or a significant portion of its range.
Endemic	Plants or animals that are native to a particular region or country.
Environment	The surrounding conditions, influences or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.
Environmental Impact Statement	A formal public document prepared to analyze the impacts on the environment of the proposed project or action and released for comment and review. An EIS must meet the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the proposed project or action.
Environmental Impact Statement, Final	The final version of the public document required by NEPA.
Ephemeral	Present only during a portion of the year. Generally refers to water courses.
Ephemeral Stream	An ephemeral stream is one that remains dry during most of the year, flowing only during a few days or weeks in response to direct runoff. Ephemeral streams do not intercept ground water flow and therefore, have no baseflow.
Evapotranspiration (ET)	The combined processes by which water is transferred from the earth's surface to the atmosphere; evaporation of liquid or solid water plus transpiration from plants.

Fault	A fracture or fracture zone in the earth's surface along which there has been displacement of the sides relative to one another.
Fault Zone	A fault that is expressed as a zone of numerous small fractures or of breccia or fault gouge. A fault zones may be hundreds of feet wide.
Fauna	The wildlife or animals of a specified region or time.
Federal Land Policy and Management Act of 1976	Public Law 94-579 signed by the President on October 21, 1976. Established public land policy for management lands administered by the Bureau of Land Management (BLM). FLPMA specifies several key directions for the BLM, notably: 1) management on the basis of multiple use and sustained yield; 2) land use plans prepared to guide management actions; 3) public lands for the protection, development, and enhancement of resources; 4) public lands retained in federal ownership; and 5) public participation used in reaching management decisions.
Floodplain	That flat portion of a river or stream valley adjacent to the river channel that is built of sediments and is inundated with water when the stream overflows its banks.
Fossil	The remains or traces of an organism or assemblage of organisms that have been preserved by natural processes in the earth's crust.
Geologic formation	A rock unit distinguished from adjacent deposits by some common physical characteristic, such as its composition, origin, color, or age.
Geology	The science that studies the earth. The materials, processes, environments, and history of the planet, especially the lithosphere, including the rocks and their formation and structure.
Ground Water	1) That part of the subsurface water that is in the saturated zone; or 2) loosely, all subsurface water as distinct from surface water.
Ground Water Flow	Ground water flow takes place below the ground water table in the form of saturated flow through alluvial deposits and other water-bearing formations beneath the soil mantle.
Habitat	The region where a plant or animal naturally grows or lives. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and home range.

Head	1) The pressure of a fluid on a given area, at a given point represented by the height of the fluid above the point; 2) the water-level elevation in a well, or elevation to which water of a flowing well rises in a pipe extended high enough to stop the flow.
Historic Roads and Trails	Historic trails/roads have been identified within Nevada. A few of the historic trails include the Old Spanish Trail/Mormon Road, which connected Santa Fe to Los Angeles.
Human environment	Interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.
Hydraulic Conductivity	For an isotropic porous medium and homogeneous fluid, the volume of water at the existing kinematic viscosity that moves in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.
Hydraulic Gradient	Slope of the water or potentionmetric surface. The change in static head per unit of distance in a given direction. If not specified, the direction generally is understood to be that of the maximum rate of decrease in head.
Hydraulic Head	The height above a datum plane (such as sea level) of the column of water that can be supported by the hydraulic pressure at a given point in a ground water system. For a well, the hydraulic head is equal to the distance between the water level in the well and the datum plane. See Head.
Hydrology	The science that studies the properties, distribution, and circulation of natural surface water and ground water.
Impact	A modification in the status of the environment brought about by a proposed action.
Indirect effect	See effects.
Infrastructure	The basic installations and facilities on which the continuance and growth of a community depend (for example, roads, schools, sewers, power plants, transportation, and communication systems).

Isolate/Isolated Artifact	A single artifact, feature, or object not associated with other cultural resources. An isolate is not normally considered a property.
Isolated Occurrences / Small Concentrations (Prehistoric)	Isolated artifacts are common finds on the landscape. Isolated artifacts and small site concentrations may consist of projectile points, ground stone, flakes, and cores as well as pot busts or a small discrete cluster of chipped stone debitage.
Karst topography	A three-dimensional landscape shaped by the dissolution of a soluble layer or layers of bedrock, usually carbonate rock such as limestone or dolomite.
Kilovolt	1,000 volts (a volt is a measure of electrical potential difference that would cause a current of 1 ampere to flow through a conductor whose resistance is 1 ohm).
Kilowatt	A unit of power equivalent to 1,000 watts.
Lacustrine	Of or relating to lakes; Living or growing in or along the edges of lakes.
Landform	A term used to describe the many types of land surfaces that exist as a result of geologic activity and weathering (for example, plateaus, mountains, plains, and valleys).
Lead agency	The agency or agencies preparing or having taken primary, responsibility for preparing the environmental impact statement.
Lithic	Pertaining to stone or a stone tool (for example, lithic artifact).
Lithology	The appearance, structure, and composition of rocks as determined by study with the unaided eye or with little magnification.
Megawatt	1,000 kilowatts or 1 million watts (a watt is a unit of electrical power equal to 1/756th horsepower).
Mesa	An isolated, nearly level land mass, formed of nearly horizontal rocks, standing above the surrounding country and bounded with steep sides.
Migratory	Birds, animals, or people, that migrate or move from one region or country to another.
Mineral resource	Any inorganic or organic substance occurring naturally in the earth that has a consistent and distinctive set of physical properties. Examples of mineral resources include coal, nickel, gold, silver, and copper.

Mining	There are several components to a mine, from the early stages of prospecting and laying claims with rock cairns, shafts, and adits to the development of mining towns with grocery and merchandise stores, saloons, tailors, churches, meat markets, bakeries, barber shops, jails, blacksmiths, law offices, cemeteries, schools, and brothels.
Mississippian	A period of the Paleozoic Era, spanning in time from about 345 to 320 million years ago.
Mitigate	To alleviate, reduce, or render less intense or severe.
Mitigation	(a) Avoiding the impact altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments.
National Ambient Air Quality Standards	Air quality standards established by the Clean Air Act. The primary NAAQS are intended to protect the public health with an adequate margin of safety; the secondary NAAQS are intended to protect the public welfare from any known or anticipated adverse effects of a pollutant.
National Environmental Policy Act of 1969	Public Law 91-190. Establishes environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.
National Register Criteria	The National Register's standards for evaluating the significance of properties were developed to recognize the accomplishments of all peoples who have made a significant contribution to our country's history and heritage. The criteria are designed to guide State and local governments, Federal agencies, and others in evaluating potential entries in the National Register.
National Register of Historic Places	A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance, established by the Historic Preservation Act of 1966.
Native vegetation	Vegetation originating in a certain region or country.

Nonattainment area	An air quality control region (or portion thereof) in which the U.S. Environmental Protection Agency has determined that ambient air concentrations exceed national ambient air quality standards for one or more criteria pollutants.
100-year flood	A flood with a magnitude that may occur once every 100 years on average. An area has a 1-in-100 chance of being inundated during any single year.
Orogeny	The process of mountain formation.
Ozone	A form of oxygen, O3, produced especially when an electric spark is passed through oxygen or air.
Paleontology	The science that deals with the life of past geological ages through the study of the fossil remains of organisms.
Paleozoic	The geologic era between the Precambrian and Mesozoic eras covering the time between 550 million and 225 million years ago. The era was characterized by the development of the first fishes, amphibians, reptiles, and land plants.
Particulates	Minute, separate particles, such as dust or other air pollutants.
Pennsylvanian	A period of the Paleozoic Era, spanning from about 320 million to 280 million years ago.
Perennial	Lasting, or active through the whole year. May refer to rivers, streams, or plants.
Perennial Stream	A perennial stream is one that always has flow. During low-flow periods, the flow of perennial streams is baseflow.
Perennial Yield	The maximum quantity of water that can be withdrawn annually from a ground water supply under a given set of conditions without causing and undesirable result.
Permeability	The measure of the ease with which a fluid can diffuse through a particular porous materials.
Permian	The seventh and last period of the Paleozoic Era, spanning from about 280 to 225 million years ago, characterized by increased reptile life and major mountain building in North America.
Petroglyph	A symbolic design or drawing or an animal or human pecked or carved into a rock or cliff face—generally prehistoric.

Physiographic Province	A large area characterized by distinctive topography, geologic structure, and other features and phenomena of nature.
Piezometer	A facility emplaced to measure and record ground water levels.
Plateau	An elevated tract of relatively level land, such as a tableland or large mesa.
Playa	The shallow central lake basin of a desert plain, in which water gathers after a rain and is evaporated.
Pleistocene	The first geologic epoch during the Quaternary period, spanning from 1.8 million years ago to approximately 10,000 years ago, characterized by extensive continental glaciation in the Northern Hemisphere.
Policy	A guiding principle upon which is based a specific decision or set of decisions.
Pore space	The open spaces or voids within a soil or rock. It is a measure of the amount of liquid or gas that may be absorbed or yielded by a particular formation.
Porosity	1) An index of the void characteristics of a soil or rock material; degree of perviousness. 2) The ratio usually expressed as a percentage of the volume of the interstices, whether isolated or connected, in a given quantity of material to the total volume of the material.
Potentiometric Surface	An imaginary surface representing the elevation and pressure head of ground water and defined by the level to which water rises in a well or piezometer. The water table is a particular potentiometric surface.
Precambrian	The earliest geologic era covering all time from the formation of the earth and ending at the Paleozoic Era, which began about 520 million years ago.
Primitive	An area that is not developed; a pristine natural area.
Quaternary	The geologic period following the Tertiary in the Cenozoic Era, beginning about 1.8 million years ago, composed of the Pleistocene and Holocene epochs, characterized by the evolution of Hominids into modern humans.
Range	A large, open area of land over which livestock can wander and graze.

Raptor	A bird of prey.
Recharge	Replenishment of ground water by a downward infiltration of water from rainfall, streams, and other sources.
Recharge Area	The area that contributes water to an aquifer.
Reclamation	Returning disturbed lands to a form and productivity that will be ecologically balanced.
Region	A large trace of land generally recognized as having similar character types and physiographic types.
Revegetation	The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as reseeding.
Right-of-way	Strip of land acquired by legal means, over which the utility corridors and access roads would pass.
Rill erosion	Rill erosion refers to the erosion process on sloping fields in which numerous and random small channels are formed by water; occurs mainly on recently cultivated soils.
Roasting Pits	These sites are common within the Prehistoric and Ethnohistoric American Southwest. Roasting pits may be associated with large habitation sites or within close proximity of resource procurement areas.
Rock Alignments	These sites are rocks that have been intentionally placed in a circular, semi-circular, or linear alignment. The alignments may have been constructed as hunting blinds, walls, or possibly game drives.
Rock Art Site	Rock art sites are relatively common in the Great Basin, and they come in a variety of styles and substyles. Rock art styles vary from geomorphic, zoomorphic, to anthropomorphic designs. Rock art sites include petroglyphs and pictographs. Rock art sites are known to exist within the region of Kane Springs Valley.
Rockshelters/Caves	Rockshelters/caves are an important component of the cultural resource assemblage in the southwest, including Nevada. Rockshelters/caves have been occupied during all time periods; some caves appear to have considerable antiquity. In general, most rockshelters / caves were typically used for short periods of time, possibly as temporary camping locations.

Sacred site	Any specific, discrete, narrowly delineated location on Federal land identified by an Indian Tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Tribe or appropriately authoritative representative has informed the agency of the existence of such a site.
Scenic quality class	The designation (A, B, or C) assigned a scenic quality rating unit to indicate the visual importance or quality of a unit relative to other units within the same physiographic province (BLM designation).
Scenic quality rating unit	A portion of the landscape that displays primarily homogeneous visual characteristics of the basic landscape features (landform, water, vegetation, and structures and modifications) that separate it from the surrounding landscape.
Scree	A steep mass of detritus on the side of a mountain; Loose rock debris covering a slope.
Sediment	Solid fragmental material, either mineral or organic, that is transported or deposited by air, water, gravity, or ice.
Seep	An area, generally small, where water, or other liquid such as oil, percolates slowly to the land surface. For water, it may be considered as a synonym of a seepage spring, but it is used by some for flows, too small to be considered a spring.
Seismicity	The relative frequency and distribution of earthquakes.
Semiarid	A climate or region characterized by little yearly rainfall and by the growth of a number of short grasses and shrubs.
Sensitive species	Species whose populations are small and widely dispersed or restricted to a few localities. Species that are listed or candidates for listing by the state or federal government.
Sensitivity	The state of being readily affected by the actions of external influence.
Sheet erosion	Sheet erosion refers to the removal of a relatively uniform thin layer of soil from the land surface by rainfall and surface runoff.
Siliceous	Containing, resembling, relating to, or consisting of silica.
Site	In archaeology, any locale showing evidence of human activity.

Socioeconomic	Of or involving both social and economic factors.
Soil mantle	A layer of soil with a greater hydrologic conductivity than the layer above.
Species	A group of individuals of common ancestry that closely resemble each other structurally and physiologically, and in nature interbreed to produce fertile offspring.
Spring	A place where ground water flows naturally from a rock or the soil onto the land surface or into a body of surface water.
Storage Sites	Storage sites are structures or caches that were constructed to store food and other items. These sites include aboveground storage structures constructed of masonry or adobe and belowground storage pits.
Strata	Plural of stratum, which is a layer of sedimentary rock that was originally deposited horizontally.
Study area	A given geographical area delineated for specific research.
Subspecies	Any natural subdivision of a species that exhibits small, but persistent morphological variations from other subdivisions of the same species living in different geographical regions or times.
Substrate	Sediment that lies beneath the surface of the earth.
Take	A prohibited action under federal law, except where authorized. To harass, harm, pursue, hunt, wound, kill, trap, capture, or collect a federally listed threatened or endangered species, or to attempt to do so. Take may include disturbance of the listed species, nest, or habitat, when disturbance is extensive enough to disrupt normal behavioral patterns for the species, although the affected individuals may not actually die.
Talus	A sloping mass of rocky fragments at the base of a cliff.
Telegraph and Telephone Lines	These features are identified with the themes of communication, development, and commerce and are often associated with ranching, mining, and development of towns.
Tertiary	The first period in the Cenozoic Era, spanning from 65 to 1.8 million years ago characterized by the development of mammals.

Theis Method	Theis analytical solution is a widely accepted method in hydrology for analyzing effect on an aquifer of groundwater withdrawal from a well. The Theis method calculates the expected drawdown assuming uniform radial flow in an confined aquifer of infinite extent.
Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Toolstone Sources and Quarries	These sites are areas that may contain toolstone material (e.g., obsidian, chert, basalt, and quartzite), discarded cores, blanks, or a dominance of decortication flakes. Hammerstones, hammerstone spalls, anvil stones, fire-cracked rock (heat treatment), flaked cobble scatters, and spatially discrete knapping areas may also be present. Toolstone sources are known in the project in the vicinity of a known obsidian source, the Kane Springs Wash Caldera.
Topography	The relative positions and elevations of surface features of an area.
Total Dissolved Solids (TDS)	The quantity of mineral (salts) in solution in water, usually expressed in milligrams per liter.
Traditional cultural property	A term referring to a tangible site, district, structure, building, or object with defensible boundaries that is important to a contemporary human community and has been for 50 years or more, that has significance under one or more criteria of the National Register of Historic Places, and with integrity of location, design, setting, materials, workmanship, feeling, and association in the perspective of those who value the place.
Transmissivity	The rate of which water of the prevailing kinematic viscosity is transmitted through a unit width of the aquifer under a unit hydraulic gradient; equal to the hydraulic conductivity times the aquifer thickness.
Triassic	The first period in the Mesozoic Era, spanning from 225 to 190 million years ago and following the Permian Period of the Paleozoic Era; characterized by the first appearance of many reptiles, including the dinosaurs.
Tributary	A stream or river that flows into a larger stream or river.
Trigger point	A threshold value that is established by the NV State Engineer.
Tuffaceous	Composed of, containing, or characteristic of a tuff (fragmental rock consisting of the smaller kinds of volcanic detritus, as ash or cinder, usually more or less stratified).

Unsaturated Zone	The zone between the land surface and the water table. It includes the capillary fringe and may contain water under pressure less than that of the atmosphere.
Utility corridor	A route used by a utility for pipelines and transmission lines.
Vegetation community	Species of plants that commonly live together in the same region or ecotone.
View shed	Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.
Visual resource management class	Classification of landscapes according to the kinds of structures and changes that are acceptable to meet established visual goals (BLM).
Water Table	1) The upper surface of a saturated zone except where that surface is formed by an impermeable body, 2) locus of points in soil water at which the pressure is equal to atmospheric pressure; or 3) the surface where ground water is encountered in a well in an unconfined aquifer. The water table is a particular potentiometric surface.
Waters of the United States	All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce including adjacent wetlands and tributaries to waters of the United States; and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.
Well Log	1) A record made by the driller, geologist, or engineer of a well which lists geologic materials encountered during drilling and information on the construction of the well (such as casing perforations and sanitary seal); or 2) a log obtained from a special device lowered in a well, showing such information as resistivity, radioactivity, spontaneous potential, and acoustic velocity as a function of depth; especially a lithologic record of the rocks penetrated.
Wetlands	Lands or areas exhibiting hydric soils, saturated or inundated soil during some portion of the plant growing season, and plant species tolerant of such conditions (includes swamps, marshes, bogs).

APPENDIX A

A-1	**Stipulation for Withdrawal of Protest between the Lincoln County Water District / Vidler Water Company, Inc. and the U.S. Fish and Wildlife Service including Monitoring, Management, and Mitigation Plan for Groundwater Development in Kane Springs Valley**
A-2	**Nevada State Engineer's Office Order 1169**
A-3	**Memorandum of Agreement between Southern Nevada Water Authority, Coyote Springs Investment, LLC., Moapa Band of Paiute Indians, Moapa Valley Water District, and the U.S. Fish and Wildlife Service**

APPENDIX A-1

Stipulation for Withdrawal of Protest between Lincoln County Water District / Vidler Water Company, Inc., and the U.S. Fish and Wildlife Service including Exhibit A (Monitoring, Management, and Mitigation Plan for Groundwater Development in Kane Springs Valley

AMENDED STIPULATION FOR WITHDRAWAL OF PROTESTS

This Amended Stipulation is made and entered into between the Lincoln County Water District and Vidler Water Company, Inc. ("LCWD&VWC") and the United States Department of the Interior, Fish and Wildlife Service (FWS). Collectively, LCWD&VWC and the FWS are referred to as the "Parties".

RECITALS

A. On February 14, 2005, LCWD&VWC filed Applications 72278, 72219, 72220, and 72221, for a combined maximum duty of approximately 17,375.28 acre-feet per year (afy), with the Nevada State Engineer's Office. The above listed applications shall hereinafter be referred as the "Applications". LCWD&VWC initially intend to pump up to 5,000 afy of groundwater from the Kane Springs Valley Hydrographic Basin (hereinafter referred to as "Kane Springs Valley") pursuant to these Applications, for municipal and domestic uses associated with the Coyote Springs Project in Lincoln County.

B. The FWS filed timely protests to the granting of water rights under the Applications pursuant to the FWS' responsibilities under the Endangered Species Act and administration of the National Wildlife Refuge System. FWS holds a Nevada State water right certificate for a flow rate of not less than 3.5 cfs as measured at the Warm Springs West flume (Permit No. 56668; Certificate No. 15097 issued subject to the terms of Permit No. 56668) for the maintenance of habitat of the Moapa dace and other wildlife purposes ("FWS Water Right"). The Moapa dace (Moapa coviacea) is an endemic fish that inhabits the upper Muddy River and tributary thermal spring systems within the Muddy River Springs/Warm Springs Area in Clark County, Nevada. The Moapa dace was federally listed as endangered on March 11, 1967 (32 FR4001). FWS manages the Moapa Valley National Wildlife Refuge established in 1979 as part of the National Wildlife Refuge System.

C. LCWD&VWC assert that the withdrawal of up to 5,000 afy of groundwater from the proposed wells in Kane Springs Valley will not have an unreasonable adverse affect on endangered species in the Coyote Springs Valley or the Muddy River Springs/Warm Springs Area. LCWD&VWC propose to request the State Engineer hold in abeyance the remaining amount requested in the Applications, until a determination is made from the monitoring of the initial groundwater withdrawal that there are no unreasonable adverse affects due to LCWD&VWC's groundwater pumping.

D. The FWS together with the United States National Park Service sent a letter to the Nevada State Engineer, dated February 6, 2006, recommending that the State Engineer amend his Order 1169 to include Kane Springs Valley and these Applications. This Stipulation is entered into in part to address the FWS's concern expressed in the February 6, 2006 letter. As such, the FWS will withdraw its request to the State Engineer by so stating on the record at the beginning of the hearing when the Stipulation is presented to the State Engineer as provided in paragraph 6 of the Stipulation.

E. The FWS asserts that the proposed groundwater withdrawals from Kane Springs Valley pose a risk of adversely impacting senior federal water rights and water-related resources, as described above, and are desirous of working in a cooperative manner with LCWD&VWC to protect these resources.

F. There are a number of existing monitoring programs required by the State Engineer for existing rights and pending applications within Coyote Spring Valley Hydrographic Basin. The State Engineer has determined in Order No. 1169 (Order) that further hydrological study is needed before a final determination can be made on pending applications and new filings to appropriate water from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs (Basin 219) and Lower Moapa Valley (Basin 220) in Lincoln and Clark Counties, Nevada. While the Order does not currently include Kane Springs Valley or the Applications, the FWS and LCWD&VWC agree there is a need to develop data relating to a better understanding and analysis to assist the State Engineer in studying the impacts from the pumping of groundwater in the regional aquifer system.

G. The Parties acknowledge that Nevada Water Law provides pursuant to NRS 534.110(4) that "It is a condition of each appropriation of ground water acquired under this chapter [534] that the right of the appropriator relates to a specific quantity of water and that the right must allow for a reasonable lowering of the static water level at the appropriator's point of diversion." Further, pursuant to NRS 534.110(5), Nevada Water Law "does not prevent the granting of permits to applicants later in time on the ground that the diversions under the proposed later appropriations may cause the water level to be lowered at the point of diversion of a prior appropriator, so long as the rights of holders of existing appropriations can be satisfied under such express conditions." It is the intent of the Parties that this Stipulation provides the initial "express conditions" to allow the development of the LCWD&VWC Applications to proceed, however, such future conditions may be different based on implementation of the monitoring, management and mitigation plan specified in Exhibit A, attached to this Stipulation and made a part hereof.

H. The State Engineer has set an administrative hearing on the protests of the FWS and other protestants commencing April 4, 2006.

I. The Parties acknowledge that White Pine County, Wayne, Ruby and Bevan Lister, and the United States National Park Service have lodged protests to the Applications, but that those entities are not Parties to or in any way bound or prejudiced by this Stipulation. Further, these protestants may enter into stipulations with LCWD&VWC concerning the LCWD&VWC Applications. Such stipulations shall not require the participation of the FWS nor modify in anyway the intent or content of this Stipulation, nor shall the FWS be bound or prejudiced by such stipulations.

J. The Parties agree that the preferred conceptual approach for protecting senior federal water rights from injury and federal water-related resources from unreasonable adverse impacts from ground water pumping is through the use of monitoring, management and mitigation of groundwater pumping. The common goal of the Parties is to manage the development of the regional carbonate-rock aquifer and overlying basin-fill aquifer systems as a water resource without causing any injury to senior federal water rights and/or unreasonable adverse impacts to federal water-related resources. Groundwater and the effects of pumping need to be properly monitored and managed to avoid adverse impacts to the water rights and water resources of the FWS. To accomplish this goal, there is a need to obtain accurate and reliable information of the aquifer's response to pumping stresses and the impact of that pumping on water rights and resources of interest. This is to be accomplished by implementing the monitoring, management and mitigation plan as set forth in Exhibit A to this Stipulation. The Parties have determined that it is in their best interests to cooperate in the collection of additional hydrologic and hydrogeologic information as set forth in Exhibit A to this Stipulation.

K. The Parties desire to resolve the issues raised by the protests according to the terms and conditions contained herein.

L. On April 10, 2006, LCWD & VWC filed application nos. 74147, 74148, 74149, and 74150 to appropriate underground water in Kane Springs Valley Hydrographic Basin (subsequent applications). Each of these subsequent filings are identical in quantity (in cfs and acre-feet per year) and point of diversion to the water right applications which are the subject of the Stipulation (application nos. 72218, 72219, 72220, and 72221). LCWD & VWD filing of the subsequent applications was precautionary in nature, and was made to protect Lincoln County Water District and Vidler Water Company's standing in the Kane Springs Hydrographic Basin in the event that applications 72218, 72219, 72220, or 72221 are denied by the State Engineer on a technical or administrative ground. The filing of the subsequent applications raises the same concerns by the FWS as stated in Recital E above. In lieu of filing protests to the subsequent applications, the parties agree that the subsequent applications shall be subject to the terms and conditions of this Amended Stipulation and do not in any way supplement applications 72218, 72219, 72220, and 72221, which are currently under consideration by the State Engineer.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties do agree as follows:

1. The FWS hereby expressly agrees to withdraw its protests to the Applications and agrees that the Nevada State Engineer may rule on the Applications based upon the terms and conditions set forth herein. The FWS agrees not to file protests to the subsequent applications based on the inclusion of the subsequent applications in this Amended Stipulation (hereinafter referred to as "Stipulation") and that the terms and condition of this Stipulation apply equally to the subsequent applications. Hereinafter in this Stipulation, the term "Applications" shall also refer to the subsequent applications. It is expressly understood that this Stipulation is binding only upon the Parties hereto and their successors, transferees and assigns, and shall not bind or seek to bind or prejudice

any other Parties or protestants, including the United States as trustee on behalf of the any Indian tribe. The execution and filing of this Stipulation with the State Engineer shall have the effect of withdrawing the FWS protests as provided for in Nevada Administrative Code § 533.150.

2. The Parties agree to implement the Monitoring, Management and Mitigation plan, attached hereto "Exhibit A", which is expressly incorporated into this Stipulation as if set forth in full herein upon the State Engineer's granting of the Applications, in total or in part, and upon the terms and conditions contained in Exhibit A.

3. This Stipulation does not waive any authorities of the FWS or the United States, including any other agency or bureau not specified in this Stipulation, nor relieves LCWD&VWC, or any party acting in conjunction with or through LCWD&VWC from complying with any federal laws, including, but not limited to, the National Environmental Policy Act, the Endangered Species Act, the Federal Land Policy and Management Act, and any and all rules and regulations thereunder. It is the expressed intention of the Parties that by entering into this Stipulation, the FWS and the United States are waiving no legal rights of any kind, except for the withdrawal of its protests as provided in Paragraph 1 of this Stipulation. Likewise, LCWD&VWC, or any party acting in conjunction with or through LCWD&VWC, by entering into this Stipulation, are not waiving any legal rights of any kind, except as expressly provided in this Stipulation and its Exhibit A.

4. Further, except as expressly stated in this Stipulation or its Exhibit A, this Stipulation does not affect any legal or administrative process or proceeding concerning rights-of-way or any action that may be necessary to further the development and/or use of the water sought under the Applications.

5. The Parties expressly acknowledge that the Nevada State Engineer has, pursuant to both statutory and case law, broad authority to administer groundwater resources in the State of Nevada and, furthermore, that nothing contained in this Stipulation shall be construed as waiving or in any manner diminishing such authority.

6. The Parties agree that a copy of this Stipulation shall be submitted to the Nevada State Engineer prior to the commencement of the administrative proceedings scheduled to begin on April 4, 2006. The Parties shall request on the record at the beginning of the scheduled proceeding, that the State Engineer include Exhibit A of the Stipulation as part of the permit terms and conditions, in the event that he grants Applications 72278, 72219, 72220, and 72221, in total or in part. The FWS, at its option, may attend the hearing, but will present no issues or statements unless necessary to explain or defend this Stipulation or Exhibit A.

7. Notices. If notice is required to be sent by the Parties, the addresses are as follows:

If to FWS:

Supervisor
Nevada Field Office
Fish and Wildlife Service
1340 Financial Blvd., #234
Reno, NV 89502

If to LCWD&VWC:
Chairman
Lincoln County Water District
P.O. Box 685
Pioche, NV 89043

And:
Dorothy Timian-Palmer
Vidler Water Company, Inc.
704 W. Nye Lane, Suite 201
Carson City, NV 89703

8. LCWD&VWC may transfer or assign its interest in the water rights here involved. Any and all transferees and assignees shall be bound by the terms and conditions of this Stipulation. As a condition to any such transfer or assignment, the transferee and/or assignee shall execute a stipulation expressly stating it is bound to all of the terms and conditions of this Stipulation.

9. This Stipulation shall be governed in accordance with the laws of the State of Nevada to the extent not inconsistent with federal law.

10. Copies of all correspondence between and data gathered by the Parties pertinent to the terms of Exhibit A shall be submitted to the Nevada State Engineer. It is the intentions of the Parties hereto that the Nevada State Engineer shall be kept informed of all activities in the same fashion as are the Parties hereto.

11. By entering into this Stipulation, the FWS does not become a party to any proceeding other than the protest proceeding referenced above or waive its immunity from suit or consent to or acknowledge the jurisdiction of any court or tribunal. Nothing in the Stipulation shall affect any federal reserved water rights of the FWS or the United States on behalf of any Indian Tribe and the FWS by entering into this Stipulation do not waive or prejudice any such rights. The FWS reserves all legal rights, of any kind, it possesses pursuant to or derived from Executive Orders, acts of Congress, judicial decisions, or regulations promulgated pursuant thereto. Neither party waives its rights to seek relief in any appropriate forum of its choice not expressly prohibited by this Stipulation.

12. Any commitment of funding by the FWS or Lincoln County Water District in this Stipulation or otherwise is subject to appropriations by Congress or the governing body of the Lincoln County Water District as appropriate.

13. This Stipulation may be amended by mutual agreement of the Parties.

14. This Stipulation sets forth the entire agreement of the Parties and supercedes all prior discussions, negotiations, understandings or agreements. No alteration of variation of this Stipulation shall be valid or binding unless contained in an amendment in accordance with paragraph 13.

15. This Stipulation is entered into for the purpose of resolving a disputed claim. The Parties agree that the Stipulation shall not be offered as evidence or treated as an admission regarding any matter herein and may not be used in proceedings on any other application or protest whatsoever, except that the Stipulation may be used in any future proceeding to interpret and/or enforce the terms of this Stipulation. Further, the Parties agree that neither the Stipulation nor any of its terms shall be used to establish precedent with respect to any other application or protest in any water rights adjudication or water rights permitting proceeding before the Nevada State Engineer or any other proceeding.

16. The terms and conditions of this Stipulation shall be binding upon and inure to the benefit of the Parties hereto and their respective, successors, transferees and assigns.

17. This Stipulation will become effective as between the Parties upon all Parties signing this Stipulation. The Parties may execute this Stipulation in two or more counterparts, which shall, in the aggregate, be signed by all Parties; each counterpart shall be deemed an original as against any Party who has signed it.

18. Other entities may become Parties to this Stipulation by mutual assent of the Parties.

19. Nothing contained herein shall limit the right of LCWD & VWC, or their successors, transferees, or assigns to assign, pledge, or encumber as security the Applications that are the subject of this Stipulation.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the dates written below.

UNITED STATES DEPARTMENT OF THE INTERIOR

Date: 8/1/2006

Fish and Wildlife Service

By Steve Thompson

Title: CNO MANAGER

Date: 7-17-06

LINCOLN COUNTY WATER DISTRICT

By *Ronda Hornbeck*

Title: *Chairwoman*

Date: *7-19-06*

VIDLER WATER COMPANY, INC.

By *[signature]*

Title: *Chief Operating Officer*

ATTEST:

[signature]

LCWD Legal Counsel

EXHIBIT A
for
Amended Stipulation between LCWD&VWC and the United States Fish and Wildlife Service

MONITORING, MANAGEMENT AND MITIGATION PLAN GROUNDWATER DEVELOPMENT IN KANE SPRINGS VALLEY

The purpose of this plan is to describe the agreements of Lincoln County Water District and Vidler Water Company, Inc. (LCWD&VWC) and the United States Fish and Wildlife Service (FWS) regarding the monitoring, management, and mitigation of potential impacts due to development of ground-water resources in the Kane Springs Valley area. This plan applies to proposed ground-water development in Kane Springs Valley that consists of the use of water under State of Nevada water-rights applications numbered 72218, 72219, 72220 and 72221 and the subsequent applications 74147, 74148, 74149, and 74150, filed by LCWD&VWC.

The Plan describes the LCWD&VWC and FWS (hereinafter referred to as "the parties") obligations regarding the development, monitoring, management, and mitigation related to the above numbered applications in Kane Springs Valley Hydrographic Basin for use that water in Coyote Spring Valley Hydrographic Basin.

This plan consists of four principle components, as follows:

1. *Monitoring Requirements,* related to production wells, monitoring wells, elevation control, and springflow, water quality, quality of data, and reporting;
2. *Management Requirements,* related to the creation and role of a Technical Review Team (hereinafter referred to as "the TRT"), the development and use of a numerical ground-water flow model, the establishment of action criteria, and the details of the decision-making process;
3. *Mitigation Requirements;* and
4. *Modification of the Plan.*

The common goal of the parties is to manage the development of the LCWD&VWC Water Rights in their entirety from Kane Springs Valley Hydrographic Basin, without resulting in any losses to senior federal water rights or unreasonable adverse impacts to federal water resources. The parties will collaborate on technical data collection and analysis and will rely on the best scientific information available in making decisions required by the Plan.

1. Monitoring Requirements

A. Production Wells

- LCWD&VWC will record discharge and water levels in their production wells in Kane Springs Valley on a continuous basis as is feasible.

B. Monitoring Wells

LCWD&VWC, as determined by the parties to this agreement, in consultation with the Nevada State

Engineer, shall locate and construct two monitoring wells down gradient from the Kane Springs Valley ground-water production well (KMW-1). The location of the first proposed monitoring well (CSIMW-1) is to be an equal distance between the existing Southern Nevada Water Authority Monitoring Well Four (CSVM-4) and the Coyote Spring Investment monitoring well CE-VF-2. Further, CSIMW-1 will be located on the north (hydraulically upgradient) side of the interpreted southwestern extension of the Kane Springs Wash fault zone on Coyote Springs Investment property along the existing abandoned Highway 93. The second proposed monitoring well (CSIMW-2) is to be located on the south (hydraulically downgradient) side of the interpreted southwestern extension of the Kane Springs Wash fault zone on Coyote Springs Investment property along the existing abandoned Highway 93. Specifically, the second well would be sited such that the distance between the monitoring well CSIMW-1 and the aforementioned fault zone is approximately equal to the distance between the fault zone and CSIMW-2. See Attachments "A-1", "A-2", "A-3" and "A-4" to this Exhibit A. FWS shall work with LCWD&VWC in good faith to ensure that the well is located and constructed in a cost-effective manner, to enable the monitoring of the potential southward progression of groundwater level declines resulting from proposed ground-water production in Kane Springs Valley.

- All monitoring wells used as part of this plan shall be installed and water levels recorded on a continuous basis as is feasible, beginning as soon as possible after the State Engineer decision relative to the Kane Springs Valley Applications.

- The initial groundwater level would be established at the time that the pumping wells in Kane Spring Valley were ready to go on-line.

- The term "as is feasible" shall relate to mechanical failures and the issues associated with the remoteness of the locations, or other events outside the control of the parties that do not permit data collection.

- The locations and monitoring frequency of the monitoring-well network will be reviewed by the TRT on an annual basis beginning in 2007, and may be reduced or expanded in scope upon its recommendation.

C. Elevation Control

- LCWD&VWC will conduct a detailed elevation survey of all their wells used for monitoring as part of this plan. LCWD&VWC will cooperate in any regional plan organized by the Nevada State Engineer to determine elevation above sea level of all major spring orifices and monitoring and production wells in the Lower Colorado Flow System region. LCWD/VWC will match the Southern Nevada Water Authority's current datum relating to monitoring and production well elevations.

D. Water Quality

- LCWD&VWC will collect water quality samples and have them analyzed for major ions, trace elements, and isotopes at all production and monitor wells used as part of this plan (as specified in Sections 1.A and 1.B.) commencing July 1, 2007.

- Thereafter, LCWD&VWC will collect and analyze water-quality samples for major ions, trace elements, and isotopes at all production and monitoring wells used as part of this plan every five years thereafter.

- Samples will be collected, analyzed and reported according to standard methods.
- Frequency, sampling location, and water quality parameters will be reviewed by the TRT on an annual basis beginning in 2007, and may be reduced or expanded in scope upon its recommendation.

E. *Reporting*

- All data collected under or as described in this plan, shall be fully and cooperatively shared among the parties.
- Water level and production data shall be provided to the FWS within 60 days of its collection by LCWD&VWC. LCWD&VWC will use its best efforts to provide data to the FWS within 30 days of its submission to LCWD&VWC, or in the case of water quality data, within 90 days of receipt of laboratory results.
- LCWD&VWC will report the results of all monitoring and sampling under this plan in an annual monitoring report

2. **Management Requirements**

A. Action Criteria

The Parties recognize that maintenance of minimum in-stream flows in the Warm Springs area is essential for the protection and recovery of the Moapa dace. Further, the parties recognize that existing data is insufficient to determine if the groundwater development in Kane Springs Valley Hydrographic Basin, that is the subject of the Plan, affects the in-stream flows in the Muddy River Springs/Warm Springs Area, and if so, to what extent. Thus, the parties agree as follows:

1. For purposes of this paragraph A., all "Average Flow Levels" specified herein shall be determined by flow measurements at the Warm Springs West flume. Average Flow Levels will be determined to have reached a particular level within a range specified in paragraphs B(2) through (7) ("Trigger Range"): (1) if the daily average flow for each of 45 consecutive days decreases to an amount within the Trigger Range, or if the 90 day average flow over any 90 consecutive day period decreases to an amount within the Trigger Range; or (2) if the daily average flow for each of 90 consecutive days increases to an amount within the Trigger Range, or if the 135-day average flow over any 135 consecutive day period increases to an amount within the Trigger Range. Any adjustment in the rating curve for the Warm Springs West flume shall result in a pro-rata adjustment of the Trigger Ranges.

2. If the Average Flow Level decreases to an amount within the Trigger Range of 3.2 cfs or less, the Parties agree to meet as soon as practicably possible to discuss and interpret all available data and plan for mitigation measures in the event flows continue to decline; and

3. If the Average Flow Level is within the Trigger Range of 3.15 cfs or less but greater than 3.0 cfs, LCWD&VWC agree to reduce pumping from all wells in Kane Springs Valley by 50% or to a pumping level no greater than 2,500 afy, whichever results in the lesser amount of pumping, until the Average Flow Level exceeds 3.15 cfs.

4. If the Average Flow Level is within the Trigger Range of 3.0 cfs or less, LCWD&VWC agree to cease pumping from all wells in Kane Springs Valley until the Average Flow Level exceeds 3.0 cfs. However, if LCWD&VWC, together with Coyote Springs Investment, LLC ("CSI"), effectuate a reduction in the quantity of water CSI would have otherwise been entitled to pump in a given year from wells within the Coyote Spring Valley, then LCWD&VWD shall have the right to pump a like quantity of water from wells within Kane Springs Valley in that year.

B. Technical Review Team

1. Upon execution of this Stipulation, the Parties shall establish a Technical Review Team ("TRT") whose members shall include two representatives ("TRT Representatives") each from LCWD&VWC and the FWS, including at least one with substantial formal training and experience in hydrogeology ("Technical Representative"). Except as otherwise provided herein, the two TRT Representatives shall together have one vote on TRT matters. By consensus, the TRT Representatives may offer voting or non-voting TRT membership to others who provide regional monitoring records and analyses to the TRT.

2. The objectives of the TRT shall be to review existing data, make recommendations concerning the monitoring efforts required by this Plan, and determine whether other criteria, such as water levels in monitoring wells, are a better indicator of potential effects of the pumping wells on the springs in the Muddy River Springs/Warm Springs Area. Either party may advance any recommendation for consideration by the other party to modify the action criteria. However, no change in the action criteria shall occur within the first five (5) years following the effective date of the Plan. After this five year period, and if the TRT reaches a consensus on changes to the action criteria, such criteria may be changed.

3. If the TRT Representatives are unable to reach consensus on the action criteria, the Parties shall refer the matter to a qualified panel of third party reviewers ("Panel") consisting of three scientists unaffiliated with any Party and having substantial formal training and experience in hydrogeology. If the Parties cannot agree by consensus on the make-up of the Panel, one member of the Panel shall be designated by each of the following from its own ranks: U.S. Geologic Survey, Nevada State Engineer (if the Nevada State Engineer declines to participate, then the Desert Research Institute shall be substituted), and a private firm with the requisite expertise designated by a majority of the Parties ("Appointing Entities"), provided that the Parties by consensus may designate different similarly qualified Appointing Entities. If any Appointing Entity for any reason is unable or refuses to designate a member of the Panel, the Parties by majority vote shall designate a qualified replacement Appointing Entity. The purpose of the referral to the Panel will be to obtain peer review of the then-current action criteria, the data upon which it is based, all previously submitted data and reports, and any other relevant and available data and analytical materials. The Panel will be asked to make its recommendation

based on the foregoing information concerning the appropriate content of the action criteria. All Parties shall have a fair and reasonable opportunity to present factual and analytical submissions in person and/or in writing to the Panel. The Parties contemplate that a determination of the Panel on the action criteria will constitute the best available scientific information concerning the impacts on Muddy River Springs/Warm Springs Area and Muddy River flows resulting from regional groundwater pumping, and the appropriateness of any proposed pumping restriction adjustments. The cost of the Panel shall be borne equally by the Parties.

3. **Mitigation Requirements**

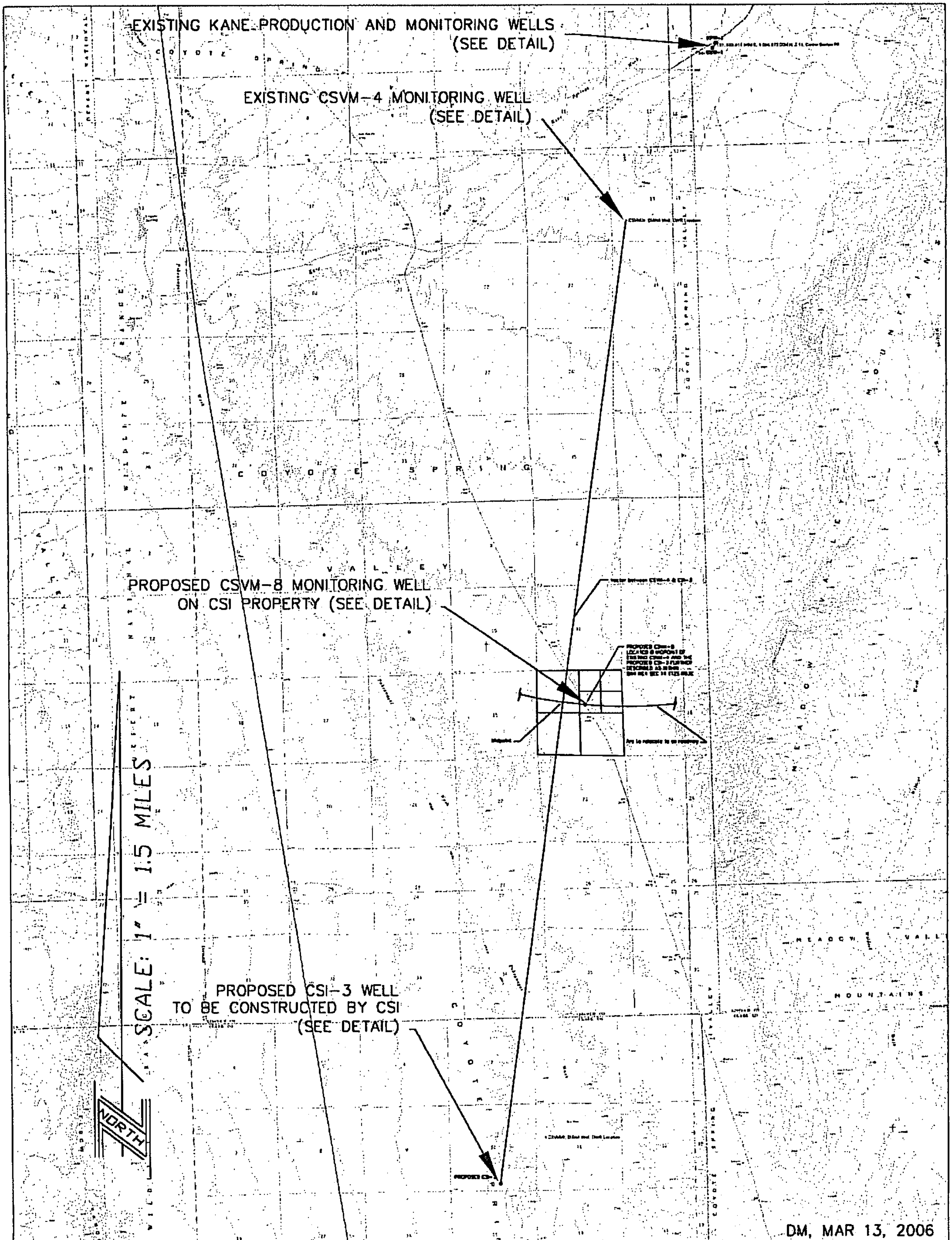
- LCWD&VWC will mitigate unreasonable adverse impacts either as agreed upon by the parties or after the Nevada State Engineer determines whether there are unreasonable adverse impacts due to LCWD&VWC pumping. LCWD&VWC will take the necessary steps to ensure that mitigation actions are feasible.

- As part of their commitment to the recovery of the Moapa dace, LCWD&VWC shall commit $50,000, annually for a period of five (5) years following the granting of the Applications, in total or in part, for the restoration of Moapa dace habitat outside the boundaries of the Moapa National Wildlife Refuge. Such restoration shall be conducted as agreed to by the FWS. In the event that the Applications as granted by the State Engineer total less than 2,500 afy, the parties agree to meet and renegotiate the annual funding amount to be consistent with the lesser quantity of water granted and the commitment by LCWD&VWC to participate in restoration activities of the Moapa dace. FWS acknowledges that Coyote Springs Investment LLC, a Nevada limited liability company (CSI), has dedicated certain quantities of water pursuant to a Memorandum of Agreement by and between the Southern Nevada Water Authority, the United States Fish and Wildlife Service, CSI, the Moapa Band of Paiutes, and the Moapa Valley Water District. FWS further acknowledges that CSI is the intended beneficiary of the water to be developed pursuant to the Applications. Thus, in the event that pumping of groundwater pursuant to the Applications is restricted pursuant to Section 2. A. of this Exhibit A to the Stipulation, FWS agrees to use any quantities of water dedicated by CSI pursuant to the MOA for the survival and recovery of the Moapa dace as directed in the MOA.

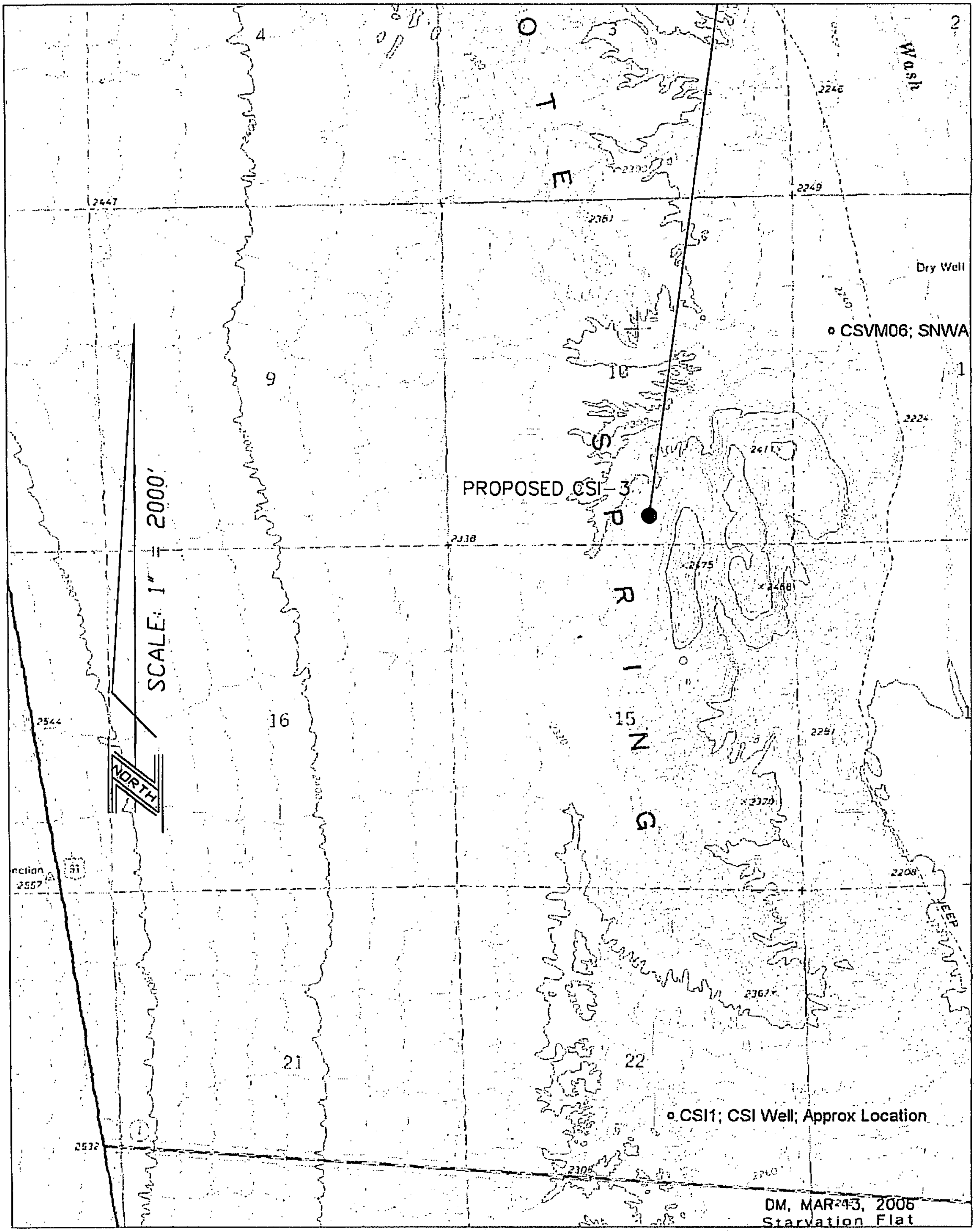
4. **Modification of the Plan**

- LCWD&VWC and the FWS may modify this plan by mutual agreement. The parties also acknowledge that the State Engineer has the authority to modify this plan. In addition, LCWD&VWC and the FWS may individually or jointly petition the State Engineer to modify this plan in the event that mutual agreement cannot be reached. Any such petition shall only be filed after 90 days written notice to the remaining party. Either LCWD&VWC or the FWS may submit written comments to the State Engineer regarding the merits of any such petition for modification.

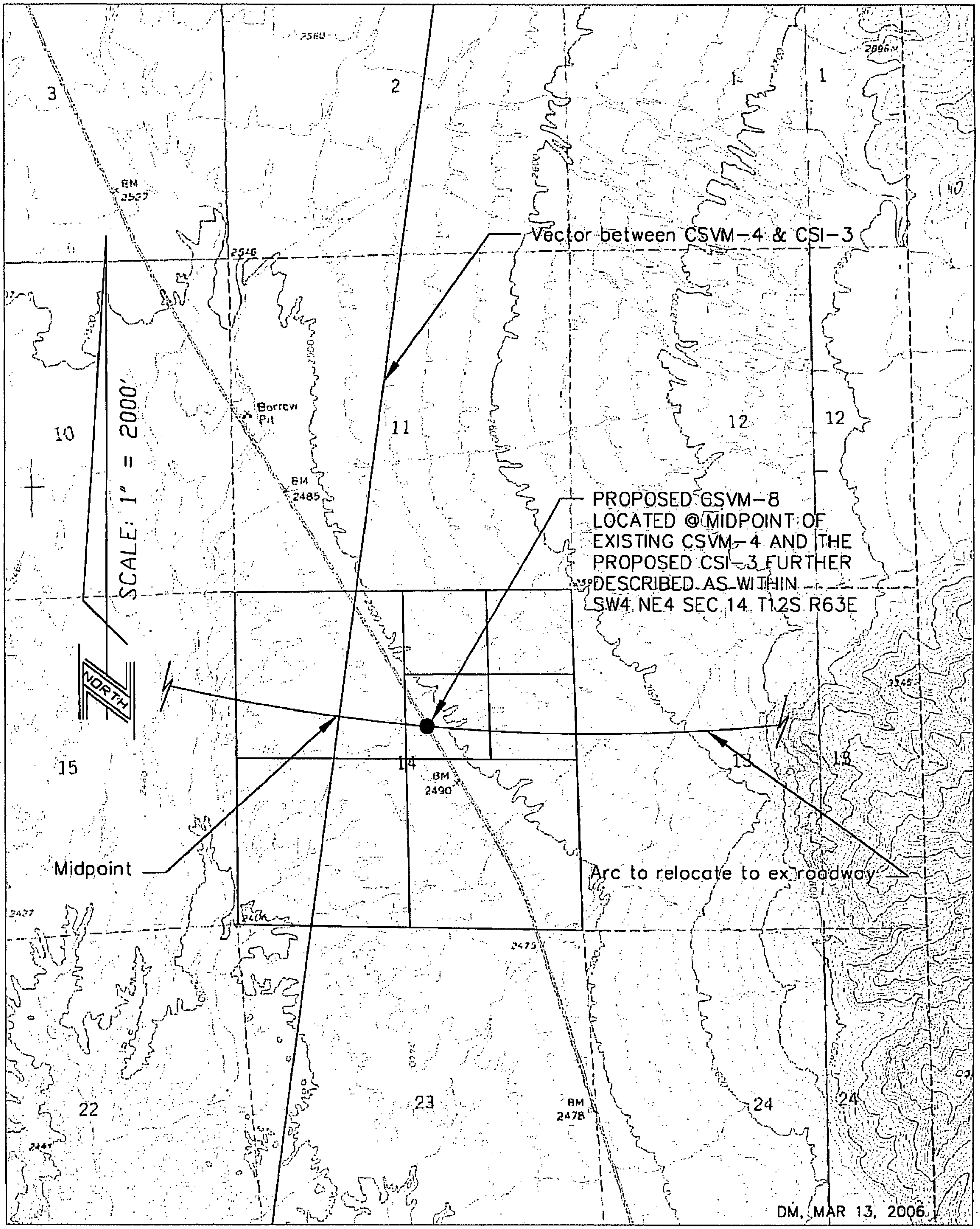
ATTACHMENT "A1"
OVERALL VIEW



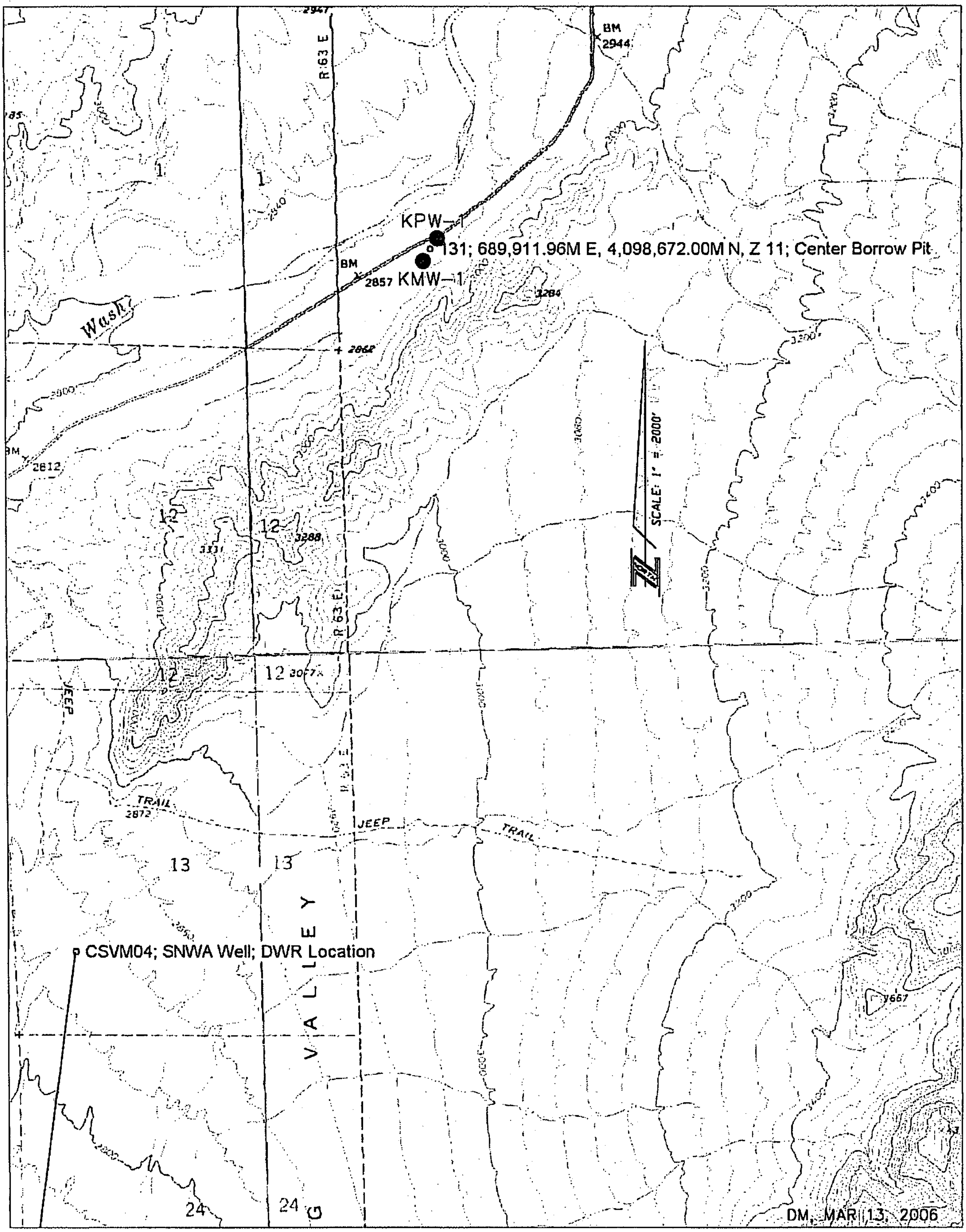
ATTACHMENT "A2"
CSI-3 DETAIL VIEW



ATTACHMENT "A3"
CSVM-8 DETAIL VIEW



ATTACHMENT "A4"
CSVM-4 & KANE SPRINGS WELLS VIEW



APPENDIX A-2

OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA
ORDER 1169

IN THE OFFICE OF THE STATE ENGINEER

OF THE STATE OF NEVADA

1169

ORDER

HOLDING IN ABEYANCE CARBONATE-ROCK AQUIFER SYSTEM GROUNDWATER APPLICATIONS PENDING OR TO BE FILED IN COYOTE SPRINGS VALLEY (BASIN 210), BLACK MOUNTAINS AREA (BASIN 215), GARNET VALLEY (BASIN 216), HIDDEN VALLEY (BASIN 217), MUDDY RIVER SPRINGS aka UPPER MOAPA VALLEY (BASIN 219), LOWER MOAPA VALLEY (BASIN 220), AND FOR FURTHER STUDY OF THE APPROPRIATION OF WATER FROM THE CARBONATE-ROCK AQUIFER SYSTEM, LINCOLN AND CLARK COUNTIES, NEVADA.

WHEREAS, the Nevada State Engineer is designated by the Nevada Legislature to perform the duties related to the management of the water resources belonging to the people of the State of Nevada.[1]

WHEREAS, the State Engineer is empowered to make such reasonable rules and regulations as may be necessary for the proper and orderly execution of the powers conferred by law.[2]

WHEREAS, the State Engineer is empowered to conduct such studies as are necessary.[3]

WHEREAS, a large portion of the State of Nevada consisting of approximately 50,000 square miles of sparsely populated land is underlain by significant carbonate-rock sequences.[4]

WHEREAS, the carbonate-rock sequences contain groundwater aquifers, which are believed to contain significant, but undetermined, quantities of ground water.

WHEREAS, many persons or entities have filed water right applications requesting permission to appropriate substantial quantities of underground water from the carbonate-rock aquifer system.

WHEREAS, in 1984, the Water Resources Division of the United States Department of Interior, Geological Survey proposed a 10-year investigation of the entire Carbonate Terrane, which includes the carbonate-rock aquifers of the areas referenced above. This study was proposed because the water resources of the Carbonate Terrane were not well defined, the hydrology and geology of the area are complex, and data was sparse.[5]

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[1] See, Nevada Revised Statutes chapters 532, 533, 534, 535 and 536.

[2] NRS § 532.120.

[3] NRS § 532.165(1), 533.368 and 533.370(2).

[4] Michael D. Dettinger, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988, Summary Report No. 1, United States Geological Survey, Department of Interior and Desert Research Institute, University of Nevada System, p. 3, 1989. See also, Memorandum dated August 3, 1984, from Terry Katzer, Nevada Office Chief, Water Resources Division, United States Department of Interior Geologic Survey, Carson City, Nevada, to Members of the Carbonate Terrane Study, Attachment p. 8, which indicates that the area underlain by significant carbonate-rock sequences in Nevada is over 40,000 square miles of sparsely populated land, and includes 106 hydrographic areas and basins.

[5] Memorandum dated August 3, 1984, from Terry Katzer, Nevada Office Chief, Water Resources Division, United States Department of Interior Geologic Survey, Carson City, Nevada, to

WHEREAS, it has been known since 1984 that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, a significant period of study would be required, and that "unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users."[6]

WHEREAS, the United States Geological Survey has indicated that given the multiple possible avenues of hydrologic connection between the various aquifers and flow systems, and the uncertainties of recharge and discharge mechanisms and processes, an investigation of the hydrology of the carbonate-rock aquifer system in Nevada is undoubtedly a difficult undertaking.

WHEREAS, an investigation of the carbonate-rock aquifer system is additionally complicated by factors including:[7]

- basic hydrologic data such as groundwater levels in the basin-fill aquifers and the carbonate-rock aquifers, and reliable flow measurements for important springs and major streams are scarce or infrequently obtained in much of the area;
- secondary hydrologic and other data, such as hydraulic parameters, geophysical and geochemical, are lacking in many areas;
- the geometry, properties, and boundaries of the carbonate-rock and basin-fill reservoirs are generally unknown, and definition of these properties can be expensive and difficult;
- climatic conditions today are inadequately defined (particularly at higher altitudes) and conditions during the development of the flow paths within the deep-rock aquifers and flow paths within the carbonate-rock aquifer are even more uncertain;
- uncertainties and inaccuracies exist in current methods of estimating precipitation;
- uncertainties and inaccuracies exist in current methods of estimating groundwater inflow and recharge;
- uncertainties and inaccuracies exist in current methods of estimating groundwater outflow and evaporative discharge;
- only a small number of wells tap the deep carbonate-rock aquifer system;
- because there has been no significant historical pumping of ground water from the carbonate-rock aquifer system, groundwater models can only be used as a limited predictive tool for estimating the principle location and magnitude of the impacts of pumping ground water from the system;
- limited stresses on the water resources of the area under current development conditions allow hydrologists information only on the narrow band of system responses to natural conditions; and
- the relationship between geothermal systems and the deep carbonate-rock aquifers and groundwater flow systems is not well understood.

WHEREAS, in 1985, the Nevada Legislature authorized a program for the study and testing of the carbonate-rock aquifer system of eastern and southern Nevada. The program was a cooperative effort between the State of Nevada and the Federal Government. The overall plan for the program was to study the carbonate-rock aquifers of southern, east-central, and northeastern Nevada as separate phases of work, with a summary of findings to be prepared at the end of each

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Members of the Carbonate Terrane Study.

[6] Ibid.

[7] Id., Attachment p. 7.

phase. A report, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988,[8] summarized the findings of the first phase of the study, which assessed the resources of the carbonate-rock aquifers of southern Nevada. The summary brought together results from more than 20 technical reports produced during the study. The summary indicated that:

> The rocks that compose the carbonate-rock aquifers are layers of limestone and dolomite that were deposited hundreds of millions of years ago in much of the eastern Great Basin. Subsequently, the carbonate rocks were much deformed; as a result, they no longer exist as continuous layers beneath the region. Instead, they have been pulled apart to form a few large areas of thick and relatively continuous carbonate rocks. Separating these areas are noncarbonate rocks, within which are isolated mountain-sized blocks of carbonate rock.
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> Beneath southern Nevada, the thick carbonate-rock layers are continuous enough to transmit ground water at regional scales only beneath a north-south "corridor" 60-90 miles wide that extends southward from east-central Nevada to and beyond the Spring Mountains area west of Las Vegas. Within this corridor are the two major regional flow systems of southern Nevada: the Ash Meadows-Death Valley system and the White River-Muddy River Springs system. These flow systems link the ground water beneath dozens of valleys and over distances exceeding 200 miles. Flow in these systems probably is concentrated along highly transmissive zones associated with (1) recently active faults and (2) confluences of flow near major warm-water springs. Outside of the corridor, the carbonate rocks are present primarily as isolated blocks that form aquifers of limited extent, recharged mostly by local precipitation.
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> * * *
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> Large-scale development (sustained withdrawals) of water from the carbonate-rock aquifers would result in water-level declines and cause the depletion of large quantities of stored water. Ultimately, these declines would cause reductions in the flow of warm-water springs that discharge from the regional aquifers. Storage in other nearby aquifers also might be depleted, and water levels in those other aquifers could decline. In contrast, isolated smaller ground-water developments, or developments that withdraw ground water for only a short time, may result in water-level declines and springflow reductions of manageable or acceptable magnitude.
>
> Confidence in predictions of the effects of development, however, is low; and it will remain low until observations of the initial hydrologic results of development are analyzed. A strategy of staging developments gradually and adequately monitoring the resulting hydrologic conditions would provide information that eventually could be used to improve confidence in the predictions.[9]

WHEREAS, because assurances that the adverse effects of development will not overshadow the benefits cannot be made with a high degree of confidence, development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate

[8] Michael D. Dettinger, Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988, Summary Report No. 1, United States Geological Survey, Department of Interior and Desert Research Institute, University of Nevada System, Forward, 1989.

[9] Id, pp. 1-2.

monitoring in order to predict, through the use of a calibrated model, the effects of continued or increased development with a higher degree of confidence.

WHEREAS, staging development gradually means not developing the resources in one large step, but rather starting with small projects that are possibly augmented gradually if conditions and confidence warrant. This approach allows the effects of development to be observed and analyzed continually, so that the benefits and adverse effects of development can be judged and the effects reversed or mitigated if they prove to be detrimental to existing rights and the environment. This approach would hopefully avoid the havoc that could be created by the curtailment of water use by those who have come to rely on it if impacts occur requiring curtailment of the water use.

WHEREAS, the 1995 Water-Resources Investigations Report 91-4146[10] estimates the total water budget of all southern Nevada aquifers from the natural recharge to the mountains and subsurface inflow to the study area[11] to be about 160,000 acre-feet annually, and discharges from major discharge areas to be about 77,000 acre-feet annually.[12]

WHEREAS, it is believed that all of the recharge and subsurface inflow cannot be captured for use.

WHEREAS, in July and August of 2001 nearly four weeks of public administrative hearings were conducted on applications filed by the Las Vegas Valley Water District (Applications 54055 - 54059, inclusive) and Coyote Springs Investment, LLC (Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive), which together request to appropriate approximately 135,000 acre-feet of water annually from the carbonate-rock aquifer system within the Coyote Springs Valley Hydrographic Basin.[13]

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that using the standard Maxey-Eakin technique for estimation of groundwater recharge from precipitation, the recharge for the Coyote Springs Valley, Muddy River Springs, Hidden Valley, Garnet Valley, Black Mountains and Lower Moapa Valley

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[10] Michael D. Dettinger, et al., Distribution of Carbonate-Rock Aquifers and the Potential for Their Development, Southern Nevada and Adjacent Parts of California, Arizona and Utah, U.S. Geological Survey, Water-Resources Investigations Report 91-4146, p. 50, 1995.

[11] The study area is defined on p. 5 of Water-Resources Investigations Report 91-4146 to be most of southern Nevada south of Tonopah and Pioche.

[12] Discharge areas are identified as Muddy River Springs 36,000 acre-feet annually (afa) of spring flow, Blue Point Spring 240 afa of spring flow, Rogers Spring 920 afa of spring flow, Frenchman Mountain 2,100 afa of underflow toward Colorado River, Pahrump Valley 18,000 afa of underflow to California, Ash Meadows 17,000 afa of spring flow and evapotranspiration, Amargosa Desert 3,000 afa of underflow to Death Valley, and Grapevine Canyon 400 afa of underflow to Death Valley. Water-Resources Investigations Report 91-4146 at 53.

[13] It is noted that at the administrative hearing on Coyote Springs Investment, LLC Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive, the applicant indicated they are requesting the State Engineer "to issue the permits as requested but limit their full use until the monitoring and mitigation program is in effect." Transcript, public administrative hearing before the State Engineer, August 20, 2001, p. 58. However, the applicant further indicated that it requested that a minimum of four permits be issued, two in each county, with the second permit in each county to be used to stress the aquifer. Two permits for a total amount of 14,478 afa would be for development, two permits for a total amount of 14,478 afa would be to stress the aquifer under some temporary development. Transcript, public administrative hearing before the State Engineer, August 20, 2001, pp. 91-96. This is after the 27,504 afa requested by the Las Vegas Valley Water District.

areas combined is approximately 3,550 acre-feet annually. Using the modified Maxey-Eakin technique introduced at the administrative hearing (known as the Donovan-Katzer 2000 technique), the recharge is estimated at approximately 6,761 acre-feet annually for the combined areas.[14]

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that approximately 50,000 acre-feet of groundwater inflow comes into the Coyote Springs Valley from northern groundwater basins and approximately 53,000 acre-feet annually outflows[15] from Coyote Springs Valley of which a portion may be available for capture from that groundwater underflow. While testimony presented indicated a belief that significant quantities of water may be available for capture from storage, it is unknown what quantity that would be and if any underground water could be appropriated without unreasonable and irreversible impacts.[16]

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that a portion of the ground water outflow from Coyote Springs Valley is believed to discharge at a rate of approximately 37,000 acre-feet annually at the Muddy River Springs area and approximately 16,000 to 17,000 acre-feet annually flows to groundwater basins further south.[17] This 37,000 acre-feet is counted as part of the 53,000 acre-feet outflow from Coyote Springs Valley resulting in 16,000-17,000 acre-feet annual flow that by-passes the Muddy River Springs area.

WHEREAS, these referenced large springs located near the central part of the Upper Moapa Valley, which that collectively discharge approximately 37,000 acre-feet annually of underground water, are fully appropriated pursuant to the Muddy River Decree.[18] It is believed that the source of water discharged originates mainly from the carbonate-rock aquifer system, but it is unknown if the discharge originates solely from the White River Flow System or is also influenced by discharge from the Meadow Valley Flow System or if there is influence from the alluvial aquifer.

WHEREAS, listed endangered and/or potential threatened species exist in the Muddy Springs/Muddy River area.

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that their own expert witnesses are unable to make a suggestion to the State Engineer as to what part of the water budget could be captured without a great deal of uncertainty, and that the question cannot be resolved without stressing the system.[19]

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[14] See, testimony of Terry Katzer and David Donavan; Exhibit 54, p. 4-25, public administrative hearing before the State Engineer, July 16-24, 2001.

[15] Taking into account for 4,000 afa of in-basin recharge and 1,000 afa of evapotranspiration.

[16] See, testimony of Terry Katzer and David Donavan, public administrative hearing before the State Engineer, July 16-24, 2001.

[17] See, testimony of Terry Katzer and David Donavan, public administrative hearing before the State Engineer, July 16-24, 2001.

[18] Judgment and Decree, In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.

[19] See, testimony of Terry Katzer and David Donavan, public administrative hearing before the State Engineer, June 16-24, 2001.

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that the State Engineer's ability to determine if development of the carbonate-rock aquifer system will impact existing rights is dependent on how the water rights are brought "on-line" and monitored.[20]

WHEREAS, testimony and evidence from the administrative hearing on the Las Vegas Valley Water District's applications indicates that little is known about the hydrologic connectivity between the groundwater basins, that virtually nothing is known about the mountain blocks, estimates of recharge to the area can vary by a factor of two, there is probably some connectivity between the water in the carbonate-rock aquifers and the alluvial groundwater basins,[21] there is still little data available and not much has changed from the information known in 1984.

WHEREAS, the State Engineer has been provided several different models, which though based on little pumping data, all provide the State Engineer with different analyses, and which all indicate that the pumping of substantial amounts of carbonate-rock aquifer water will likely impact the sources of the Muddy River.

WHEREAS, the State Engineer has previously granted groundwater permits, which authorize use of underground water in the area underlain by the carbonate-rock aquifer system or directly from the carbonate-rock aquifer system in the following quantities:

Coyote Springs Valley (Basin 210)	16,300 acre-feet
Black Mountain (Basin 215)	10,216 acre-feet
Garnet Valley (Basin 216)	3,380 acre-feet
Hidden Valley (Basin 217)	2,200 acre-feet[22]
Muddy River Springs aka Upper Moapa Valley (Basin 219)	14,756 acre-feet
Lower Moapa Valley (Basin 220)	5,813 acre-feet
	50,465 acre-feet

WHEREAS, of all the water rights issued from the carbonate-rock aquifer system, to date very few have actually been pumped.

WHEREAS, if 16,000 to 17,000 acre-feet is believed to by-pass the Muddy River Springs area, the water right permits already issued in Coyote Springs Valley alone equal the estimate of the amount of carbonate flow that by-passes the region and is not part of the flow discharged from the Muddy River Springs area.

WHEREAS, Nevada Revised Statute § 533.370(2)(b) provides that the State Engineer may postpone action on an application in areas where studies of water supplies are necessary.

WHEREAS, Nevada Revised Statute § 533.368 provides that if the State Engineer determines that a hydrological study, an environmental study or any other study is necessary before he makes a final determination on an application, and the applicant, a governmental agency or other person has not conducted such a study or the required study is not available, the State Engineer shall advise the applicant of the need for the study and the type of study required.

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[20] Ibid.

[21] Ibid.

[22] This 2,200 acre-feet is combined with 2,200 acre-feet issued in Garnet Valley for a total of 2,200 afa between the two basins.

WHEREAS, Nevada Revised Statute § 533.368(4) provides that the State Engineer shall consult with the applicant and the governing body of the county or counties in which the point of diversion and place of use are located concerning the scope and progress of the study.

WHEREAS, the State Engineer believes it is prudent to work with a model, and the appropriate model will be determined in conjunction with the parties identified below who are responsible for participating in the study.

WHEREAS, the State Engineer does not believe it is prudent to issue any additional water rights to be pumped from the identified portions of the carbonate-rock aquifer until a significant portion of the water rights which have already been issued are pumped for a substantial period of time in order to determine if the pumping of those water rights will have any detrimental impacts on existing water rights or the environment.

NOW THEREFORE, the State Engineer orders:

1. All applications pending and any new filings for the appropriation of water from the carbonate-rock aquifer system in Coyote Springs Valley (Basin 210), Black Mountains Area (Basin 215), Garnet Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs aka as Upper Moapa Valley (Basin 219), and Lower Moapa Valley (Basin 220) will be held in abeyance until further information is obtained by stressing the aquifer by those water right permits already issued to appropriate water from the carbonate-rock aquifer system.

2. While the studies proposed in 1985 were a beginning, those studies indicated that large-scale developments with sustained withdrawals of water from the carbonate-rock aquifers would result in water-level declines and depletion of stored water, but that isolated smaller groundwater developments or developments of limited duration may result in water-level declines and springflow reductions of manageable and acceptable magnitudes. However, very little additional information based on hard science has been produced since that time. Nevada Revised Statute § 533.368 provides the State Engineer with the authority to withhold action on pending applications and to advise the applicant of the need for additional study. The State Engineer finds that further hydrological study is needed before a final determination can be made on carbonate-rock aquifer system water right applications in the referenced basins.

3. The State Engineer, in conjunction with those identified below as applying for additional water rights and already having an interest in water rights permitted from the carbonate-rock aquifer system, or their successors in interest, will conduct a study to provide information on the effect of pumpage of those water rights which have already been issued from the carbonate-rock aquifer.

The entities that shall participate in the study must at a minimum include:

Las Vegas Valley Water District
Southern Nevada Water Authority
Coyote Springs Investment, LLC
Nevada Power Company
Moapa Valley Water District.

The study must cover a 5-year minimum period during which at least 50% of the water rights currently permitted in the Coyote Springs Valley groundwater basin are pumped for at least 2 consecutive years.

4. These referenced applicants or permittees shall bear the cost of the study, and a cash deposit divided pro rata among them will be required as set forth in NRS § 533.368(3) after a determination of the estimate of cost to complete the study.

5. The State Engineer will arrange meetings between the State Engineer and the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, and Moapa Valley Water District, or their successors, and the governing bodies of the counties in which there are proposed points of diversion and places of use under their pending applications concerning the scope of the study.

6. The State Engineer orders the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Environmental Technologies, Inc., Chemical Lime Co., Nevada Cogeneration Associates, or their successors, who presently hold water rights authorized for appropriation from the carbonate-rock aquifer, to provide the other parties to the study and the State Engineer with data on a quarterly basis as to the rate at which water was diverted under the specific water right permits issued, total acre-feet diverted per month, and monthly water level measurements

7. After the study period, the Las Vegas Valley Water District; Southern Nevada Water Authority; Coyote Springs Investment, LLC; Nevada Power Company; and Moapa Valley Water District are ordered to file with the State Engineer, within 180 days of the end of the fifth consecutive year, a report as to the information obtained and any impacts seen to the groundwater or surfacewater resources of the carbonate-rock aquifer or alluvial aquifer systems from the pumping of those rights presently permitted.

8. At the end of the study period, the Las Vegas Valley Water District/Southern Nevada Water Authority will update Exhibit 54 from the July 2001 hearings in order to show the State Engineer the effects, if any, of the water it requested for appropriation under Applications 54055 - 54059, inclusive, as they are filed. The State Engineer will then make a determination if he has sufficient information to proceed with ruling on those applications for which hearings have already been conducted, i.e., Las Vegas Valley Water District (Applications 54055 - 54059, inclusive) and Coyote Springs Investment, LLC (Applications 63272 - 63276, inclusive, and 63867 -63876, inclusive), and other applications pending for the appropriation of water from the carbonate-rock aquifer system.

Hugh Ricci, P.E.

HUGH RICCI, P.E.
State Engineer

Dated at Carson City, Nevada,

this 8th day of March, 2002

CERTIFICATE OF SERVICE

I, the undersigned, declare under penalty of perjury, that I am an employee of the Nevada Division of Water Resources, that I am over the age of eighteen (18) years, and that I am not a party to, nor interested in, this action. On this date, I mailed a true and correct copy of Nevada Division of Water Resources' Order No. 1169, addressed to the following:

Las Vegas Valley Water District
Attn: Kay Brothers
1001 S. Valley View
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Cert. Mail #7000 0520 0023 8555 9034

Coyote Springs Investment, L.L.C.
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C.S. Inc.
Judy Kuban
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Dry Lake Water, LLC
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Salt Lake City, UT 84111
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C.O. Myers, Exec. Dir.
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Bakersfield, CA 93380
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Nevada Power Co.
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Las Vegas, NV 89151-0001
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Oxford Energy of Nevada, Inc.
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Stallion Sand & Gravel, LLC
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Wyman Engineering Consultants
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John E. Hiatt
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Las Vegas, NV 89123
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City of Caliente
Attn: George T. Rowe, Mayor
P.O. Box 158
Caliente, NV 89008
Cert. Mail #7000 0520 0023 8558 4685

County of Nye
P.O. Box 1767
Tonopah, NV 89049
Cert. Mail #7000 0520 0023 8558 4692

Ely Shoshone Tribe
16 Shoshone Circle
Ely, NV 89301
Cert. Mail #7000 0520 0023 8558 4708

Lincoln County, Board of Commissioners
P.O. Box 90
Pioche, NV 89043
Cert. Mail #7000 0520 0023 8558 4715

Clark County Commissioners
500 S. Grand Central Parkway
Las Vegas, NV 89106-4506
Cert. Mail #7000 0520 0023 8558 4807

Muddy Valley Irrigation District
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Cert. Mail #7000 0520 0023 8558 4722

U.S. Bureau of Indian Affairs
Attn: Barry Welch
P.O. Box 10
Phoenix, Az. 85001
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U.S.D.I., B.L.M.
Attn: Ben F. Collins, District Manager
P.O. Box 26569
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Cert. Mail #7000 0520 0023 8558 4746

U.S. Fish and Wildlife Service
911 NE 11th Ave.
Portland, OR 97232-4184
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U.S. National Park Service
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George Benesch
P.O. Box 3498
Reno, NV 89505

Dated this 8 day of March, 2002.

Sandra Allec

APPENDIX A-3

Memorandum of Agreement between Southern Nevada Water Authority, Coyote Springs Investment LLC, Moapa Band of Paiute Indians, Moapa Valley Water District, and United States Fish and Wildlife Service

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement ("MOA") is entered into this 20th day of April, 2006, (the "Effective Date") by and between the Southern Nevada Water Authority ("SNWA"), a political subdivision of the State of Nevada, the United States Fish and Wildlife Service ("FWS"), Coyote Springs Investment LLC, a Nevada limited liability company ("CSI"), the Moapa Band of Paiute Indians ("Tribe") and the Moapa Valley Water District ("MVWD"), a political subdivision of the State of Nevada. For convenience, SNWA, FWS, CSI, the Tribe and MVWD are at times herein referred to individually as "Party" and collectively as "Parties."

RECITALS

A. In Order No. 1169 the Nevada State Engineer held in abeyance applications for new groundwater rights in certain groundwater basins, and mandated that SNWA, MVWD and other parties conduct a regional groundwater study including the pumping of at least 50 percent of the permitted water rights within the Coyote Spring Valley hydrographic basin for a period of at least two consecutive years ("Pump Test").[1] SNWA currently owns 9,000 afy of water rights with points of diversion within the Coyote Spring Valley hydrographic basin under Permit Nos. 49414, 49660 through 49662 and 49978 through 49987 ("SNWA Water Rights").

B. To facilitate the Pump Test and delivery of SNWA Water Rights, SNWA applied to the Bureau of Land Management ("BLM") for a right-of-way across Federal land for the

[1] Currently there are 16,100 acre-feet per year ("afy") of permitted groundwater rights in the Coyote Spring Valley hydrologic basin, including the SNWA Water Rights and CSI Water Rights, defined in Recitals A and D herein, and Order No. 1169 requires the continuous diversion of 8,050 acre-feet per year during the Pump Test.

construction and operation of a pipeline to deliver groundwater from the Coyote Spring hydrographic basin to either the Muddy River System or to MVWD's service system.

C. In Ruling No. 5115 the Nevada State Engineer granted Application No. 54075, filed by the Las Vegas Valley Water District ("District") on October 17, 1989, for a total duty of 2,500 afy with a diversion rate of 5.0 cubic feet per second ("cfs") within the California Wash hydrographic basin ("Permit No. 54075"). By separate agreement, the District has transferred ownership of Permit No. 54075 to the Tribe. The Tribe plans to divert and utilize groundwater under Permit No. 54075.

D. CSI is a private landowner in the Coyote Spring Valley hydrographic basin and owns 4,600 afy of water rights with points of diversion within the basin under Permit Nos. 70429 and 70430 ("CSI Water Rights").

E. MVWD is responsible for supplying the municipal water needs of Upper and Lower Moapa Valley located in Clark County, Nevada. MVWD owns several water rights within Upper Moapa Valley including surface rights to spring flows in the Muddy Springs area and groundwater rights (Permit Nos. 52520, 55450 and 58269) with points of diversion at the Arrow Canyon well and a right to 1.0 cfs of spring flow from the Jones Spring (Certificate No. 10060) ("Jones Water Right").

F. FWS is a Federal agency within the Department of the Interior. FWS' responsibilities include implementation of the Endangered Species Act and administration of the National Wildlife Refuge System. FWS holds a Nevada State water right certificate for a flow rate of not less than 3.5 cfs as measured at the Warm Springs West flume (Permit No. 56668; Certificate No. 15097 issued subject to the terms of Permit No. 56668) for the maintenance of habitat of the Moapa dace and other wildlife purposes ("FWS Water Right").

G. The Moapa dace (*Moapa coriacea*) is an endemic fish that inhabits the upper Muddy River and tributary thermal spring systems within the Warm Springs area in Clark County, Nevada. The Moapa dace was federally listed as endangered on March 11, 1967 (32 FR 4001). FWS manages the Moapa Valley National Wildlife Refuge established in 1979 as part of the National Wildlife Refuge System.

H. Based upon its evaluation of available data, FWS postulates that current groundwater pumping by MVWD at the Arrow Canyon well is causing a decline in spring flows in the Warm Springs area and that future withdrawals of groundwater by SNWA and/or CSI in the Coyote Spring Valley hydrographic basin and/or by the Tribe in the California Wash hydrographic basin may cause spring flows to decline. SNWA, CSI, and MVWD do not believe the available hydrologic data supports these conclusions.

I. The Tribe believes that regional groundwater monitoring and scientifically valid, but conservative, regional computer modeling have demonstrated and will continue to demonstrate that on-Reservation groundwater pumping authorized under Permit No. 54075 will not cause appreciable declines in spring flows in the Warm Springs area.

J. Prior to the issuance of Order No. 1169, a stipulation was executed on July 19, 2001, between Federal agencies and SNWA regarding protests filed by Federal agencies against SNWA applications for new groundwater rights in the Coyote Spring Valley hydrographic basin. The Federal agencies and SNWA agreed to implement a monitoring study that was clarified in a Monitoring, Management, and Mitigation Plan for Existing and Future Permitted Groundwater Development in Coyote Spring Valley ("3M Plan") attached to and incorporated in that stipulation.

K. As part of the approval of the MVWD water rights at the Arrow Canyon well, the Nevada State Engineer required a monitoring plan. A monitoring plan has been developed and agreed upon jointly by MVWD, Nevada Power Company, FWS and National Park Service, with the most recent amendments to that plan being submitted to the State Engineer in September 2002 ("MVWD Monitoring Plan").

L. State Engineer Ruling No. 5115 requires that "[a] monitoring program approved by the State Engineer prior to the diversion of any water [under Permit No. 54075] be prepared in conjunction with the [Pump Test] ordered in State Engineer's Order No. 1169."[2] The Tribe will develop, in coordination with the other Parties, a monitoring plan approved by the Nevada State Engineer prior to applying any groundwater to beneficial use under Permit No. 54075 ("Tribal Monitoring Plan").

M. On March 11, 2005, the Nevada State Engineer approved a document entitled "Southern Nevada Water Authority's Monitoring Plan for Groundwater Applications and Permits in Coyote Spring Valley, Hidden and Garnet Valleys, and California Wash Hydrographic Basin, Clark and Lincoln Counties March, 2005" ("SNWA Monitoring Plan"). The State Engineer directed that the SNWA Monitoring Plan serve as the monitoring plan required by the State Engineer for the SNWA Water Rights and the CSI Water Rights.

N. The Parties share a common interest in the conservation and recovery of the Moapa dace and its habitat. Each Party also has an interest in the protection, use and enjoyment of its water rights and entitlements. To serve these interests, the Parties have identified certain conservation measures with the objective of making measurable progress toward the conservation and recovery of the Moapa dace, and have agreed to coordinate the monitoring, management and mitigation measures included and to be included in the 3M Plan, MVWD

Monitoring Plan, SNWA Monitoring Plan, and Tribal Monitoring Plan (collectively the "Regional Monitoring Plans").

O. The Parties desire that FWS engage in consultation and prepare a formal biological opinion under the provisions of Section 7 of the Endangered Species Act and its implementing regulations prior to execution of this MOA. The consultation shall consider the effects on the Moapa dace from the pumping of 9,000 afy under the SNWA Water Rights, 4,600 afy under the CSI Water Rights, and 2,500 afy by the Tribe under Permit No. 54075, together with the implementation of the monitoring, management and conservation measures identified herein.

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties do agree as follows:

I. Conservation Measures. The Parties agree that in order to make measurable progress toward protection and recovery of the Moapa dace and its habitat concurrent with the operation and development of water projects for human use, it is beneficial to the public interest to establish the following conservation measures:

1. Establishment of Recovery Implementation Program. To effectuate the goals of this MOA the Parties agree to establish a Recovery Implementation Program ("RIP") whereby measures necessary to accomplish the protection and recovery of the Moapa dace, the operation and development of regional water facilities, and the inclusion of necessary and interested third parties are outlined and implemented. To facilitate establishment of the RIP:

a. The Parties agree to cooperate in the selection of qualified personnel and/or contractors to oversee the development of the RIP.

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[2] Ruling No. 5115 at 40.

b. SNWA agrees to provide funding in the amount of $300,000.00 to develop the RIP. SNWA agrees to execute such documents as may be necessary to ensure that these funds are available to meet the needs of those persons designated by the Parties with the task of establishing the RIP.

c. The Parties agree to seek the cooperation of other parties within the region that have an interest in the development and management of water and biological resources. To achieve the goals of the RIP, the Parties agree to employ principles of adaptive management to further the current understanding of the habitat and aquatic needs of the Moapa dace. The Parties will jointly negotiate the participation of any other party in the RIP.

2. Dedication of the Jones Water Right. The Parties agree that the recovery of the Moapa dace will be enhanced by the guarantee of additional in-stream flows in areas of historical Moapa dace habitat. One such area is the Apcar Stream down gradient of the Jones Spring. The Parties concur that the dedication of the Jones Water Right to the purpose of providing in-stream flows will be beneficial to the Moapa dace population in this area and further the recovery of the species. To effectuate the dedication of the Jones Water Right to the provision of in-stream flows in the Apcar Stream, the Parties agree as follows:

a. MVWD agrees to record an agreement between MVWD and FWS ("Jones Springs Agreement") on the Jones Water Right with both the Nevada State Engineer and the Clark County, Nevada, Recorder's Office that requires the entire 1.0 cfs flow right under the Jones Water Right to be dedicated to the purpose of maintaining in-stream flows in the Apcar Stream subject to the provisions of paragraph 7 of the Jones Springs Agreement. MVWD shall retain ownership of the Jones Water Right. The Jones Springs Agreement shall be executed and recorded promptly upon execution of this MOA. A draft of the Jones Springs Agreement is attached hereto as "Exhibit A." The Jones Springs Agreement ultimately recorded pursuant to this paragraph shall be in substantially the same form as Exhibit A.

b. SNWA agrees to transfer to MVWD, at no cost, a portion of Permit No. 49414 equal to 724 afy. This transferred portion of Permit No. 49414 shall remain of equal priority date with that portion of Permit No. 49414 retained by SNWA.

c. MVWD agrees to transfer to SNWA, at no cost, the first 724 afy, or any portion thereof if less than 724 afy is permitted, of any permit(s) issued by the Nevada State Engineer pursuant to Application Nos. 54055 through 54059, inclusive.

d. The Parties agree to cooperate with MVWD in the filing and processing of any change applications, including applications to change the manner or place of use that are filed by MVWD with the Nevada State Engineer in order to effectuate the Jones Springs Agreement referenced in paragraph I(2)(a) above.

e. Subject to paragraph 2 of the Jones Springs Agreement, the Parties agree to cooperatively determine the best methods to ensure that the Jones Water Right accomplishes the purpose stated in paragraph I(2)(a) above, as related to the recovery of the Moapa dace and other endemic species, including the possibility of restoration of the springhead at Jones Spring.

3. <u>Dedication of Portion of CSI Water Rights</u>.

a. CSI agrees to record a conservation easement with both the Nevada State Engineer and the Clark County, Nevada, Recorders Office dedicating 460 afy of the CSI Water Rights to the survival and recovery of the Moapa dace and its habitat. The use of this water would be at the discretion of the FWS in consultation with the CSI and the Parties.

b. In addition, CSI agrees to dedicate 5 percent of all water rights above 4,600 afy that CSI may in the future be entitled to withdraw from Coyote Spring Valley hydrographic basin or any water rights that CSI imports into and uses in the basin. The Parties, consistent with the RIP, will determine the most effective method for utilizing such water rights. CSI shall execute and record such documentation, including conservation easements, deeds, change applications and reports of conveyance, as may be necessary to effectuate the dedication of that portion of such water rights that is subject to the terms and conditions contained herein.

4. Habitat Restoration and Recovery Measures. To restore the habitat necessary for the Moapa dace and take other steps to protect and recover the species, the Parties agree as follows:

a. SNWA agrees to provide funding in the amount of $750,000.00 for the restoration of Moapa dace habitat under the direction of FWS on the Apcar Unit of the Moapa National Wildlife Refuge or otherwise. All tasks funded under this paragraph I(4)(a) shall be agreed to in advance by SNWA and FWS in consultation with the other Parties. SNWA agrees to execute such documents as may be necessary in order to ensure that these funds are available for such habitat restoration.

b. FWS agrees to provide funding in the amount of $125,000.00 and SNWA agrees to provide funding in the amount of $125,000.00 to develop an ecological model designed to investigate the effects of habitat change on the ecology of the Moapa dace. FWS and SNWA shall, in consultation with the other Parties, agree upon the selection of a contractor to prepare the model.

c. SNWA agrees to provide funding in the amount of $50,000.00 to construct fish barriers to help eliminate the predacious Tilapia from areas of Moapa dace habitat. FWS and SNWA shall, in consultation with the other Parties, agree upon the selection of a contractor to perform such work.

d. SNWA agrees to provide funding in the amount of $25,000.00 to implement programs related to the eradication of non-native fish species, including predacious Tilapia, in the Warm Springs area. FWS and SNWA shall, in consultation with the other Parties, agree upon the selection of a contractor to perform such work.

e. CSI agrees to provide FWS with funding on an annual basis in the amount of $50,000.00 for a period of four years following the execution of this MOA for the restoration of Moapa dace habitat outside the boundaries of the Moapa National Wildlife Refuge along the Apcar Stream, or at such other locations as CSI and FWS, in consultation with the other Parties, agree.

f. The Tribe agrees to use a reasonable portion of the existing on-Reservation greenhouse facility for a reasonable period of years, for the purpose of cultivating native vegetation for use in RIP-approved habitat restoration. The Parties understand that the greenhouse is in a state of major disrepair and that such use of the greenhouse will require repairs and a water supply. FWS will work with the Tribe to obtain the funding necessary to provide for such repairs and to identify and secure a water supply adequate for such use. The Tribe reserves the right to pursue, and if feasible implement, separate arrangements for the improvement and commercial operation of the remainder of the greenhouse.

g. The Tribe agrees to provide access to the Tribe's Reservation for the construction and subsequent maintenance of at least one fish barrier, at a mutually agreeable location, to help eliminate the predacious Tilapia from Moapa dace habitat. FWS will work with the Tribe to obtain the funding necessary for construction, maintenance and repair of such barrier(s).

h. The Tribe agrees to provide the services of the Tribe's Environmental Director for in-kind staff services and participation in the RIP.

5. <u>Protection of In-Stream Flows</u>. The Parties recognize that maintenance of minimum in-stream flows in the Warm Springs area is essential for the protection and recovery of the Moapa dace. Although those flows are unknown at this time, the Parties agree as follows:

a. For purposes of this paragraph I(5), all "Average Flow Levels" specified herein shall be determined by flow measurements at the Warm Springs West flume. Average Flow Levels will be determined to have reached a particular level within a range specified in paragraphs I(5)(b) through (g) ("Trigger Range"): (1) if the daily average flow for each of 45 consecutive days decreases to an amount within the Trigger Range, or if the 90 day average flow over any 90 consecutive day period decreases to an amount within the Trigger Range; or (2) if the daily average flow for each of 90 consecutive days increases to an amount within the Trigger Range, or if the 135 day average flow over any 135 consecutive day period increases to an amount within the Trigger Range. If determined to be necessary by the Parties, the Parties will cooperate in removing phreatophytes, repairing or replacing the flume or taking any other steps to ensure the accuracy of flume measurements. Any adjustment in the rating curve for the Warm Springs West flume shall result in a pro-rata adjustment of the Trigger Ranges. The remaining provisions of this paragraph I(5) apply both during and after the Pump Test, except for paragraphs I(5)(c)(i) and (ii) which apply only during the Pump Test.

b. If the Average Flow Level decreases to an amount within the Trigger Range of 3.2 cfs or less, the Parties agree to meet as soon as practicably possible to discuss and interpret all available data and plan for mitigation measures in the event flows continue to decline.

c. If the Average Flow Level decreases to an amount within the Trigger Range of 3.0 cfs or less, the following Parties agree to take the following further actions:

i. During the pendency of the Pump Test, MVWD agrees to immediately cease pumping from the Arrow Canyon well; and

ii. While the Arrow Canyon Well is shut down pursuant to paragraph I(5)(c)(i) above, SNWA agrees to supply MVWD with all necessary municipal and domestic water supplies from the MX-5 and RW-2 wells or other sources available to the SNWA. Except for the express provision contained in paragraph I(2)(b) of this MOA, nothing in this MOA will obligate SNWA to supply MVWD with any water from SNWA's existing permits in the Coyote Spring Valley following the completion of the Pump Test; and

iii. SNWA and CSI agree to take necessary actions to prepare to geographically redistribute their groundwater pumping in the Coyote Spring Valley should flow levels continue to decline; and

d. If the Average Flow Level is within the Trigger Range of 3.0 cfs or less but greater than 2.9 cfs, the pumping of SNWA from the MX-5, RW-2, CS-1 and CS-2 wells in combination with the pumping of CSI from the MX-5, RW-2, CS-1 and CS-2 and CSI's pumping from other wells within the Coyote Springs Valley ("CSV") shall be restricted to 8,050 afy.

e. If the Average Flow Level is within the Trigger Range of 2.9 cfs or less but greater than 2.8 cfs, the pumping of SNWA from the MX-5, RW-2, CS-1 and CS-2 wells in combination with the pumping of CSI from the MX-5, RW-2, CS-1 and CS-2 and CSI's pumping from other wells in CSV shall be restricted to 6,000 afy, and the pumping of the Tribe under Permit No. 54075 shall be restricted to 2,000 afy.

f. If the Average Flow Level is within the Trigger Range of 2.8 cfs or less but greater than 2.7 cfs, the pumping of SNWA from the MX-5, RW-2, CS-1 and CS-2 wells in combination with the pumping of CSI from the MX-5, RW-2, CS-1 and CS-2 and CSI's pumping from other wells in CSV shall be restricted to 4,000 afy, and the pumping of the Tribe under Permit No. 54075 shall be restricted to 1,700 afy.

g. If the Average Flow Level is within the Trigger Range of 2.7 cfs or less, the pumping of SNWA from the MX-5, RW-2, CS-1 and CS-2 wells in combination with the pumping of CSI from the MX-5, RW-2, CS-1 and CS-2 and CSI's pumping from other wells in CSV shall be restricted to 724 afy, and the pumping of the Tribe under Permit No. 54075 shall be restricted to 1,250 afy.

h. The Parties agree that any pumping of the 460 afy of CSI Water Rights dedicated to the survival and recovery of the Moapa dace pursuant to paragraph 3.a. of this MOA shall be at the discretion of FWS and not counted against the pumping restrictions set forth in paragraphs 5(d) through 5(g) of this MOA.

6. Hydrologic Review Team. Upon execution of this MOA, the Parties shall establish a Hydrologic Review Team ("HRT") which shall be constituted and function as follows:

a. Membership. Each Party shall appoint two representatives ("HRT Representatives"), including at least one with substantial formal training and experience in hydrogeology ("Technical Representative"). Except as otherwise provided herein, the two HRT Representatives shall together have one vote on HRT matters. By consensus, the HRT

Representatives may offer voting or non-voting HRT membership to others who provide regional monitoring records and analyses to the HRT.

b. Objectives. The objectives of the HRT shall be: (1) to identify opportunities and make recommendations for the purpose of coordinating and ensuring accuracy, consistency and efficiency in monitoring, other data collection, and analytical activities performed under the Regional Monitoring Plans; (2) to establish technically sound analyses of impacts on Muddy River Springs and Muddy River flows resulting from regional groundwater pumping; (3) to assess based thereon whether the pumping restrictions, but not the Trigger Ranges, under paragraphs I(5)(c) through (g) above (or any successors thereto) should be adjusted to better reflect the extent to which regional groundwater pumping by the respective Parties causes, or is likely to cause, impacts on Muddy River Springs and Muddy River flows; and (4) to adopt by consensus appropriate adjustments to such restrictions, if warranted.

c. Regional Baseline Pumping Analysis. Within one year following the execution of this MOA, the Technical Representatives shall prepare a written analysis of regional groundwater pumping data and impacts ("Regional Baseline Pumping Analysis"). In preparing such baseline analysis, the HRT shall consider all relevant and available data and analytical materials. The Regional Baseline Pumping Analysis shall set forth all shared and dissenting analyses, interpretations and recommendations of the participating Technical Representatives. All modeling analyses contained therein shall be based on modeling codes in the public domain and data files that are available for comprehensive review by all Technical Representatives.

d. Annual Determination. Based on the Regional Baseline Pumping Analysis, and no later than one year after preparation of that analysis and annually thereafter, the HRT shall endeavor to determine by consensus ("Annual Determination") whether the groundwater pumping restrictions, but not the Trigger Ranges, under paragraphs I(5)(c) through (g) above (or any successors thereto) should remain in place, or whether and how any of such restrictions should be adjusted ("Pumping Restriction Adjustments") to better reflect the extent to which regional groundwater pumping by the respective Parties causes, or is likely to cause, impacts on Muddy River Springs and Muddy River flows. However, no Pumping Restriction Adjustments will be made within the first five years following the Effective Date of this MOA. All Annual Determinations (including any Pumping Restriction Adjustments adopted by HRT consensus) shall be final and binding on all Parties, except that by consensus the HRT may at any time modify or vacate any Annual Determination.

e. Annual Determination Reports. Each Annual Determination shall be set forth and explained in a written Annual Determination Report which includes as appendices the Regional Baseline Pumping Analysis, all previously submitted Annual Technical Representative's Reports, and any other data or analytical materials considered by the HRT. If the Annual Determination is not made due to lack of consensus or any other reason, the positions thereon of the HRT Representatives shall be set forth and explained in the Annual Determination Report. Furthermore, if the HRT fails to adopt Pumping Restriction Adjustments recommended in a timely submitted Annual Technical Representative's Report, the Annual Determination Report shall briefly explain why such recommendation was not adopted.

f. Annual Technical Representative's Reports. Within six months after the close of the year of this MOA and annually thereafter, based on the best available scientific data and information, any Technical Representative may submit to all other HRT Representatives a written report ("Annual Technical Representative's Report") containing both: (1) a well-documented professional analysis of monitored regional pumping and pumping impacts; and (2) recommendations, if any, for Pumping Restriction Adjustments.

g. Provision for Peer Review. If the HRT Representatives are unable to reach consensus on an Annual Determination, the Parties shall refer the matter to a qualified panel of third party reviewers ("Panel") consisting of three scientists unaffiliated with any Party and having substantial formal training and experience in hydrogeology. If the Parties cannot agree by consensus on the make-up of the Panel, one member of the Panel shall be designated by each of the following from its own ranks: U.S. Geologic Survey, Desert Research Institute and a private firm with the requisite expertise designated by a majority of the Parties ("Appointing Entities"), provided that the Parties by consensus may designate different similarly qualified Appointing Entities. If any Appointing Entity for any reason is unable or refuses to designate a member of the Panel, the Parties by majority vote shall designate a qualified replacement Appointing Entity. The purpose of the referral to the Panel will be to obtain peer review of the then-current Annual Determination Report, the data upon which it is based, all previously submitted Annual Technical Representative's Reports, and any other relevant and available data and analytical materials. The Panel will be asked to make its recommendation based on the foregoing information concerning the appropriate content of the Annual Determination. All Parties shall have a fair and reasonable opportunity to present factual and analytical submissions in person and/or in writing to the Panel. The Parties contemplate that a determination of the Panel on the Annual Determination will constitute the best available scientific information concerning the impacts on Muddy River Springs and Muddy River flows resulting from regional groundwater pumping, and the appropriateness of any proposed Pumping Restriction Adjustments. The cost of the Panel shall be borne equally by the Parties.

7. Acquisition of Additional Land and Water Rights. As a potential conservation measure, the Parties agree to work cooperatively to identify both land and water rights that, if acquired and dedicated to the recovery of the Moapa dace, will assist in making measurable progress towards the recovery of the Moapa dace. SNWA agrees to make a good faith effort to acquire land and water rights identified by the Parties. The Parties expressly agree that the reasonableness of any terms and conditions for any acquisition of land or water rights by SNWA shall be determined by SNWA at SNWA's sole discretion, and that SNWA shall have no obligation to acquire any land or water rights upon terms and conditions that SNWA finds unreasonable. When such land or water rights are acquired by SNWA, SNWA will cooperate with FWS in establishing restrictions upon the use of such lands and water rights consistent with existing laws so as to effectuate the conservation of these resources and the recovery of the Moapa dace.

8. Operational Coordination Among FWS, SNWA, CSI and MVWD. Consistent with the terms of this MOA and to accomplish the goals of protecting and recovering the Moapa dace, and accommodating the operation of municipal water supply infrastructure, FWS, SNWA, CSI and MVWD agree to examine all reasonable water operational scenarios and agree to implement feasible scenarios that will minimize impacts to the Moapa dace and its habitat, including, but not limited to the provision of water to MVWD from the Coyote Spring Valley hydrographic basin during the Pump Test or other water supplies available to SNWA and MVWD. MVWD shall have the right during the Pump Test to use the Arrow Canyon Well only in the event and to the extent SNWA is unable to supply MVWD with "all necessary municipal and domestic water supplies" pursuant to the provisions of paragraph I(5)(c)(ii) of this MOA. Except for the express provision contained in paragraph I(2)(b) of this MOA, nothing in this

MOA will obligate SNWA to supply MVWD with any water from SNWA's existing permits in the Coyote Spring Valley hydrographic basin following the completion of the Pump Test.

SNWA and CSI agree, following the execution of this MOA, and in coordination with FWS, to cooperate in locating and drilling one or more production wells in the northern part of the Coyote Spring Valley hydrographic basin. The details of this cooperative effort shall be contained in a separate agreement between CSI and SNWA.

9. Adaptive Management Measures. The Parties agree to carry out additional conservation measures that will need to be taken to protect and recover the Moapa dace following the initiation of the RIP and as more data becomes available both as to the biology of the Moapa dace and regional hydrology. Thus, the Parties agree to cooperate in carrying out the following measures as may be appropriate:

a. Funding, preparation and implementation of biological and hydrological studies and activities supporting the recovery of the Moapa Dace; and

b. Establish a regional monitoring and management plan that will include science-based management and mitigation measures for RIP participants; and

c. Assessing the feasibility of augmenting and/or restoring in-stream flows and establishing those flows as deemed feasible.

d. Continue to re-evaluate necessary measures to protect and recover the Moapa dace.

II. Current Access Agreement. SNWA currently has an access agreement with the owners of the Warm Springs Ranch, which contains Moapa dace habitat, in order to conduct biological surveys of the Moapa dace. SNWA agrees to use its best efforts to seek to amend this access agreement so that each of the Parties to this MOA will have similar rights of access to the Warm Springs Ranch.

III. Modification of MVWD Monitoring Plan. Pursuant to the MVWD Monitoring Plan, submitted to the Nevada State Engineer in September 2002, FWS and MVWD agreed to a monitoring plan for development of MVWD's water rights at the Arrow Canyon well that contained certain management and mitigation measures that would be taken if flows at the Warm Springs West flume reached 3.17 cfs and 2.94 cfs respectively. This monitoring plan was recognized by the Nevada State Engineer in Ruling No. 5161. The Parties agree that, in order to effectuate a uniform regional monitoring and management plan, that the flow level restrictions and mitigation measures contained in this MOA shall replace the flow and water level restrictions and mitigation measures contained in the MVWD Monitoring Plan.

IV. No Assertion of FWS State Water Right. Provided that the other Parties to this MOA are in full compliance with the terms of this MOA, FWS expressly agrees not to assert a claim of injury to the FWS Water Right against either MVWD for pumping at the Arrow Canyon Well, against the Tribe for pumping within the California Wash hydrographic basin or against SNWA or CSI for any pumping in the Coyote Spring Valley for any diminution in flows at the Warm Springs West flume above 2.7 cfs. This provision shall in no way prejudice the FWS' ability and/or right to assert any and all rights inherent to the FWS Water Right for any diminution in flows at the Warm Springs West flume below 2.7 cfs.

V. No Waiver of Statutory Duties or Legal Rights. This MOA does not waive any of the authorities or duties of the FWS or the United States, nor does it relieve SNWA, CSI, the Tribe and MVWD from complying with any Federal laws, including but not limited to, the National Environmental Policy Act, Endangered Species Act, National Wildlife Refuge System

Improvement Act of 1997, and Federal Land Policy and Management Act of 1976, and any and all rules and regulations thereunder. Except as provided in paragraph IV of this MOA, it is the expressed intention of the Parties that FWS and the United States are not waiving any legal rights or obligations of any kind, including obligations to consult or re-consult under the Endangered Species Act, by entering into this MOA. Further, this agreement is entered as a good faith resolution of certain issues and is not intended to waive any party's rights in a subsequent legal proceeding regarding those issues. In addition, except for the restrictions set forth in paragraphs I(5)(e) through (g) above, this MOA does not in any respect waive, limit, or diminish any rights or claims of the Tribe to any federally-reserved or State surface or groundwater rights.

VI. No Modification of Previous Agreements. The Parties recognize that CSI, SNWA and MVWD have previously entered into multiple agreements concerning the sale, purchase and settlement of water rights within the Coyote Spring Basin including a certain *Agreement For Settlement Of All Claims To Groundwater In The Coyote Spring Basin* entered into between MVWD, CSI, SNWA and the District on March 7, 2002, and a certain *Agreement For Option, Purchase and Sale of Water Rights, Real Property and Easements* entered into between SNWA and CSI on April 16, 1998. Nothing contained herein is intended to abrogate or modify in any manner any of the provisions contained in any of those agreements except as expressly provided in paragraphs I(2)(b) and I(2)(c) of this MOA.

VII. Miscellaneous Provisions.

1. Notices. If notice is required to be sent by the Parties, the addresses are as follows:

If to FWS:

Supervisor
Nevada Fish and Wildlife Office
Fish and Wildlife Service
1340 Financial Blvd., #234
Reno, Nevada 89502

If to SNWA:

General Manager
Southern Nevada Water Authority
1001 South Valley View Boulevard
Las Vegas, Nevada 89153

If to MVWD:

General Manager
Moapa Valley Water District
Post Office Box 257
Logandale, Nevada 89021

If to CSI:

Carl Savely, General Counsel
Wingfield Nevada Group
6600 North Wingfield Parkway
Sparks, Nevada 89436

If to the Tribe:

Chairperson, Moapa Band of Paiute Indians
Post Office Box 340
Moapa, Nevada 89025
Fax: 702-865-2875

With copies to:

Steven H. Chestnut
Richard M. Berely
Ziontz, Chestnut, Varnell, Berely & Slonim
2101 Fourth Avenue, Suite 1230
Seattle, Washington 98121
Fax: 206-448-0962

2. Choice of Law. This MOA shall be governed in accordance with applicable Federal laws, and the laws of the State of Nevada to the extent not inconsistent with Federal law.

3. Funding. Any commitment of funding by FWS, MVWD or SNWA under this MOA is subject to appropriations by the respective governing bodies of those entities.

4. Amendment. This MOA may be amended in writing by mutual agreement of the Parties.

5. Integration. This MOA sets forth the entire agreement of the Parties and supercedes all prior discussions, negotiations, understandings or agreements with respect to the subject matter hereof. No alteration or variation of this MOA shall be valid or binding unless contained in an amendment in accordance with paragraph VI(4) of this MOA.

6. Binding Effect, Withdrawal From MOA. The terms and conditions of this MOA shall be binding upon and inure to the benefit of the Parties hereto and their respective personal representatives, successors, transferees and assigns. However, the Parties expressly agree that should the execution of this MOA, or any consultation held or biological opinion issued under Section 7 of the Endangered Species Act which is premised thereon, be challenged in a court of competent jurisdiction and be found in violation of the Endangered Species Act or any other law, any of the Parties may withdraw from the MOA upon thirty days written notice to the other Parties. Upon such withdrawal, the withdrawing Party shall have no further obligation to perform any commitment contained in this MOA.

7. Effective Date, Counterparts. This MOA will become effective as between the Parties upon all Parties signing this MOA. The Parties may execute this MOA in two or more counterparts, which shall, in the aggregate, be signed by all Parties; each counterpart shall be deemed an original as against any party who has signed it.

8. Additional Parties. Other entities may become Parties to this MOA by mutual written assent of the Parties.

9. Headings. The underlined paragraph headings used in this MOA are for the convenience of the Parties only, and shall not be deemed to be of substantive force in interpreting the MOA.

10. No Third Party Beneficiaries. This MOA does not create any right or benefit, substantive or procedural, enforceable by any third parties against the Parties or against any other person or entity. The terms of this MOA are not enforceable by any person or entity other than a Party.

IN WITNESS WHEREOF, the Parties have executed this Memorandum of Agreement on the 20th day of April, 2006.

MOAPA VALLEY WATER DISTRICT

By: Ivan Cooper
Title: Chairman

U.S. FISH AND WILDLIFE SERVICE

for By: Steve Thompson
Title: Manager, California/Nevada Operations Office

SOUTHERN NEVADA WATER AUTHORITY

Amanda M. Cyphers

By: Amanda M. Cyphers
Title: Chair

COYOTE SPRINGS INVESTMENT, LLC

By: Robert R. Derck
Title: General Manager

MOAPA BAND OF PAIUTE INDIANS

By: Dalton Tom
Title: Chairman

When Recorded Mail To:

____
____
____

Jones Springs Agreement

This Jones Springs Agreement ("Agreement") is entered into for the purposes described herein this 20th day of April, 2006 by between Moapa Valley Water District ("MVWD"), Muddy Valley Irrigation Company ("MVIC") and the U.S. Fish and Wildlife Service ("FWS").

RECITALS

1. MVWD was created in 1983 by an act of the Nevada Legislature and is the municipal water purveyor in upper and lower Moapa Valleys and serves the communities of Moapa, Glendale, Logandale and Overton, and the surrounding areas, located in Clark County, Nevada.

2. One of MVWD's water sources is a spring known locally as Pipeline Jones Spring ("Jones Spring"). Certificate No.10060 issued by the Nevada State Engineer provides MVWD the right to divert 1 c.f.s. of flow of water from Jones Spring for municipal purposes. The waters of Jones Spring and Certificate No.10060 constitute a portion of the Muddy River Decreed water rights.

3. Water from Jones Spring, as well as numerous other springs, form small streams which make up the Muddy River ("Tributary Streams").

4. There lives in the upper reaches of the Muddy River and in the Tributary Streams, a small minnow known as the Moapa Dace ("Dace"). The Dace was listed as endangered in 1967 under the Endangered Species Preservation Act of 1966 and continues to be so listed and protected under the Endangered Species Act of 1973 as amended.

5. MVWD needs the quantity of water represented by Certificate No.10060 to serve its municipal customers.

6. As an inducement to MVWD to grant this Agreement, the Southern Nevada Water Authority ("SNWA") has agreed to furnish to MVWD a quantity of water equal to MVWD's rights under Certificate No.10060 from SNWA's wells and water rights in Coyote Spring Valley ("Coyote Spring Water"). The terms and conditions of SNWA's obligations are set forth in a separate agreement.

7. MVWD desires to help in the recovery and preservation of the Dace.

NOW THEREFORE, for the purpose of aiding in the recovery and preservation of the Dace, MVWD and FWS hereby agree as follows:

1. Effective on MVWD receiving Coyote Spring Water from Southern Nevada Water Authority, the water from Jones Spring shall not be diverted for municipal purposes pursuant to Certificate No.10060, but shall be allowed to flow down the Tributary Streams to the Muddy River.

EXHIBIT A

2. MVWD may, as soon as Coyote Spring Water is available and being furnished to MVWD for municipal purposes disconnect their existing pumping facilities from the Jones Spring diversion pipe and or otherwise affix appurtenances that will allow the entire flow of water from Jones Spring to flow down to the Muddy River, thus increasing the flow of water in one or more Tributary Streams.

3. MVWD shall file any necessary change applications with the State Engineer as may be required by Nevada Law as a result of this Agreement.

4. The Agreement herein granted shall be for a non-consumptive use of water, with no warranty as to quality or quantity of flow.

5. MVWD reserves the right to change the point of diversion for its consumptive use right to the water from Jones Spring to a point on the Muddy River below that site generally known as the White Tank Narrows and to utilize such water for any purpose permitted by the Nevada State Engineer. Any such change shall not affect the flow of water at Jones Spring for in-stream purposes.

6. This Agreement will be recorded with the Clark County Recorder and filed with the Nevada State Engineer.

7. So long as MVWD is in full compliance with the terms and conditions applicable to MVWD in the Memorandum of Agreement dated April 20, 2006 and attached hereto as Attachment 1, then, if for any reason, whether natural, man-made or otherwise, any portion of the Coyote Spring Water becomes unavailable or unusable to meet MVWD's municipal needs previously supplied by Certificate 10060 (Jones Spring), then MVWD shall have the right to utilize a like portion of water from Jones Spring to replace such portion of the Coyote Spring Water that remains unavailable to MVWD for so long as the Coyote Spring Water remains unavailable.

8. MVIC has joined in the execution of this Agreement to reflect MVIC's approval of the terms thereof.

IN WITNESS WHEREOF, MVWD, MVIC and FWS have executed this Agreement the date first above written.

MOAPA VALLEY WATER DISTRICT

By: ______________________
Ivan Cooper, Chairman of the Board

U.S. FISH AND WILDLIFE SERVICE

By: ______________________
for Steve Thompson, Manager
California/Nevada Operations Office

MUDDY VALLEY IRRIGATION COMPANY

By: ______________________
Todd Robison, Chairman of the Board

STATE OF NEVADA)
)
COUNTY OF CLARK)

This instrument was acknowledged before me on April 20, 2006, by Ivan Cooper as Chairman of the Board of MOAPA VALLEY WATER DISTRICT.

DIANNE K. WEST
Notary Public State of Nevada
No. 98-0443-1
My appt. exp. Dec. 16, 2009

Dianne K West
NOTARY PUBLIC in and for the State of Nevada
My Commission Expires: 12-16-09

[SEAL]

STATE OF NEVADA)
)
COUNTY OF CLARK)

This instrument was acknowledged before me on April 20, 2006, by Robert D. Williams as Field Supervisor of U.S. FISH AND WILDLIFE SERVICE

DIANNE K. WEST
Notary Public State of Nevada
No. 98-0443-1
My appt. exp. Dec. 16, 2009

Dianne K West
NOTARY PUBLIC in and for the State of Nevada
My Commission Expires: 12-16-09

[SEAL]

STATE OF NEVADA)
)
COUNTY OF CLARK)

This instrument was acknowledged before me on April 20, 2006, by Todd Robison as Chairman of the Board of MUDDY VALLEY IRRIGATION COMPANY.

DIANNE K. WEST
Notary Public State of Nevada
No. 98-0443-1
My appt. exp. Dec. 16, 2009

Dianne K West
NOTARY PUBLIC in and for the State of Nevada
My Commission Expires: 12-16-09

[SEAL]

APPENDIX B

Nevada State Engineers Ruling 5712

IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA

IN THE MATTER OF APPLICATIONS 72218, 72219, 72220 AND 72221 FILED TO APPROPRIATE THE UNDERGROUND WATERS OF THE KANE SPRINGS VALLEY HYDROGRAPHIC BASIN (206) LINCOLN COUNTY, NEVADA.

RULING

#5712

GENERAL

I.

Application 72218 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cubic feet per second (cfs) of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically described as portions of T.8S., R.62E., T.8S., R.63E., T.8S., R.64E., T.9S., R.61E., T.9S., R.62E., T.9S., R.63E., T.9S., R.64E., T.10S., R.61E., all of T.10S., R.62E., portions of T.10S., R.63E., T.10S., R.64E., T.11S., R.61E., all of T.11S., R.62E., portions of T.11S., R.63E., T.11S., R.64E., T.12S., R.61E., all of T.12S., R.62E., all of T.12S., R.63E., portions of T.12S., R.64E., T.12.5S., R.61E., T.12.5S., R.62E., T.13S., R.61E., all of T.13S., R.62E., portions of T.13S., R.63E., T.13S., R.64E., T.13.5S., R.63E., T.14S., R.61E., all of T.14S., R.62E., portions of T.14S., R.63E., T.15S., R.61E., T.15S., R.62E., T.15S., R.63E., T.16S., R.62E., M.D.B.& M. The proposed point of diversion is described as being located within the SW¼ SE¼ of Section 25, T.8S., R.65E., M.D.B.&M.[1]

II.

Application 72219 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located within the SE¼ SW¼ of Section 31, T.9S., R.65E., M.D.B.&M.[2]

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[1] File No. 72218, official records of the Office of the State Engineer. Exhibit No. 2, public administrative hearing before the State Engineer, April 4-6, 2006. Hereinafter the exhibits and transcript will be referred to solely by exhibit number or transcript page.
[2] Exhibit No. 3.

III.

Application 72220 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located within the SE¼ SW¼ of Section 6, T.11S., R.64E., M.D.B.&M.[3]

IV.

Application 72221 was filed on February 14, 2005, by Lincoln County Water District and Vidler Water Company, Inc., to appropriate 6.0 cfs of the underground water of the Kane Springs Valley Hydrographic Basin for municipal purposes within Coyote Spring Valley Hydrographic Basin more specifically as described above. The proposed point of diversion is described as being located in the SE¼ SW¼ of Section 11, T.9S., R.65E., M.D.B.&M.[4]

V.

Applications 72218 and 72219 were timely protested by White Pine County; however, said protests were withdrawn prior to the administrative hearing.[5]

VI.

Applications 72218 and 72219 were timely protested by Wayne Lister, Ruby Lister and Bevan Lister on the grounds that:

1. Lincoln County Water District has no written adopted plan for the use of the water applied for under this permit. There is no city or town within the area of this permit.
2. We have long argued that moving water from one basin to another is detrimental to the originating basin.
3. Lincoln County Water District is supposed to be a local government entity protecting and planning for the benefit of the citizens of Lincoln County but in teaming up with Vidler they become merely speculative with the sole objective to make a profit.[6]

VII.

Applications 72218, 72219, 72220 and 72221 were timely protested by the United States Department of Interior, National Park Service ("NPS") on the grounds that:

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[3] Exhibit No. 4.
[4] Exhibit No. 5.
[5] Exhibit No. 6.
[6] Exhibit No. 7.

1. There is no water available for appropriation because committed water resources exceed ground-water recharge.
2. The approval and development of the appropriation proposed by this application will impair the water rights of the United States, because:
   A. The appropriation, in combination with other appropriations and withdrawals in Coyote Spring Valley will further reduce the discharge of the Muddy River. The United States' senior water right and other existing rights to the Muddy River would be impaired, if the appropriation is approved and developed.
   B. The proposed appropriation, in combination with existing appropriations and pending applications in the White River ground-water flow system, if approved and developed, would reduce the discharge of Lake Mead NRA [National Recreation Area] springs, because of the large potential withdrawal rate. The drawdown caused by such large withdrawals would extend to capture ground water that naturally discharges through the springs.
   C. The effects of the appropriation proposed by this application, when combined with other existing and proposed appropriations, could impair the senior water rights of the Lake Mead NRA more quickly and/or to a degree greater than the withdrawal proposed under this application alone.
3. The public interest would not be served, by granting a permit to this application, because:
   A. The public interest would not be served by granting this application, because the water and water-related resources in the nationally important Lake Mead NRA would be diminished or impaired, as a result of the appropriation proposed by this application.
   B. The land which the applicant proposes to withdraw the water is not owned by the applicant. [This protest claim only goes to Applications 72218 and 72219.][7]

VIII.

Applications 72220 and 72221 were protested by the United States Department of Interior, Fish and Wildlife Service ("FWS") on the grounds that:

> The proposed groundwater development threatens the biological and water resources under the jurisdiction of the US Fish and Wildlife Service in the White River Groundwater Flow System. Kane Springs Valley is located upgradient of Coyote Spring Valley and the Muddy River Area. Pumping of groundwater from the basin could reduce the groundwater influx to springs at Moapa Valley National Wildlife Refuge in the Muddy River Area. The combined perennial yield for Coyote Spring valley [sic] and Kane Springs Valley may be on the order of 2,600 acre-feet/yr as estimated in ground-water Resources Reconnaissance Series Report 25. Although there are no permits in Kane Springs Valley, there are at least 200,000

[7] Exhibit No. 8.

> acre-feet/yr of permitted and pending applications in Coyote Spring Valley, directly downgradient. An additional withdrawal would only add to the current exceedance of the perennial yield for the combined basins. Such a withdrawal of groundwater in excess of the perennial yield could result in reduced groundwater flow from Coyote Spring Valley to the Muddy River Area, or result in a reversed gradient causing groundwater outflow from Coyote Spring Valley to Kane Springs Valley. Senior water rights held by the Fish and Wildlife Service in the Moapa Valley National Wildlife refuge [sic] could be adversely impacted. Such an impact to the water rights and resources of the Moapa Valley National Wildlife refuge [sic] and environs could adversely impact threatened and endangered species including Moapa dace and Southwestern Willow Flycatcher; which depend on these water resources for survival. Water-dependent resources in Lower Meadow Valley Wash may be threatened by the proposed development too. The combined volume from all of these pending applications and permitted water rights exceeds all current estimates of the available water for appropriation in the White River Groundwater Flow System. Lacking more information to demonstrate that water is available for appropriation without adversely impacting existing water rights and water-related resources, these applications should be denied.[8]

IX.

By letter dated February 6, 2006, the NPS and FWS requested the State Engineer amend State Engineer's Order No. 1169 to include the Kane Springs Valley Hydrographic Basin within the provisions of the Order and included a request to hold these applications in abeyance until the pumping ordered in Coyote Spring Valley was completed and analyzed.[9] The reasoning behind the request is that these agencies believe Kane Springs Valley and Coyote Spring Valley, while administratively classified as separate hydrographic basins, are actually a single distinct hydrologic drainage basin and should be managed as such. At the public administrative hearing on these applications, the Applicant and Protestant FWS presented a stipulation to resolve the FWS's protests.[10] The resolution was also in lieu of statements made on behalf of the FWS in the February 6, 2006, letter that requested Kane Springs Valley be included in State Engineer's Order No. 1169.[11] Pursuant to the Stipulation, the FWS withdrew its protests and the parties requested that Exhibit A to the Stipulation be included as part of the terms and conditions of any applications that are granted. However, the NPS's request to include Kane Springs Valley Hydrographic Basin within the provisions of Order No. 1169 remains to be resolved.

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[8] Exhibit No. 9.
[9] Exhibit No. 10.
[10] Exhibit No. 116.
[11] Transcript, p. 12.

X.

After all parties of interest were duly noticed by certified mail, an administrative hearing was held with regard to the protested applications on April 4-6, 2006, at Carson City, Nevada, before representatives of the Office of the State Engineer.[12]

FINDINGS OF FACT

I.

The Listers protested the applications on the grounds that Lincoln County Water District has no written plan for the use of the water applied for and there is no city or town within the area of the applications. The State Engineer finds there is no requirement in Nevada water law for a written plan to be provided in furtherance of a water right application. The State Engineer finds water right applications are almost always filed for proposed projects that are planned, but not in existence, and the water cannot be used until the State Engineer grants a permit that authorizes the use of the water. As discussed in Section III below, the Nevada Legislature has provided the Lincoln County Water District with the authority to serve water to all real property located within the boundaries of Lincoln County. Nevada water law requires that an applicant provide evidence of an actual beneficial use for the water applied for[13] and proof satisfactory to the State Engineer of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and his financial ability and reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.[14] The State Engineer finds, as discussed below, that the Applicant provided substantial evidence of a project where the water applied for would be used and proof satisfactory of construction of the work to apply the water to the intended beneficial use with reasonable diligence and the financial ability and reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.

II.

The Listers' protests allege that they have long argued that moving water from one basin to another is detrimental to the originating basin. The State Engineer finds that Nevada water law specifically provides for the interbasin transfer of water provided the applicant meets all of the

[12] Exhibit No. 1.
[13] NRS § 533.035.
[14] NRS § 533.370.

necessary criteria found in the Nevada Revised Statutes, including but not limited to NRS §§ 533.370(5) and (6). Nevada Revised Statute § 533.370(6)(c) and (d) require the State Engineer to take into consideration whether the proposed action is environmentally sound as it relates to the basin from which the water is exported and whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported. The State Engineer finds Nevada water law requires the State Engineer to consider factors relevant to the originating basin, but specifically provides for the interbasin transfer of water.

III.

The Listers' protests allege that the Lincoln County Water District is supposed to be a local government entity protecting and planning for the benefit of the citizens of Lincoln County but, that in teaming up with Vidler Water Company, the Lincoln County Water District has become merely speculative with the sole objective to make a profit. In 2003, the Nevada Legislature enacted legislation that provided for the creation of the Lincoln County Water District.[15] The special legislative act that created the Lincoln County Water District provided that its jurisdiction and service area are all the real property located within the boundaries of Lincoln County and authorized the Lincoln County Water District to sell water and water rights and to enter into agreements with a private entity or corporation for the transfer or delivery of any water right or water appropriated.[16]

The State Engineer finds the Nevada Legislature gave the Lincoln County Water District its authority. The State Engineer finds the Lincoln County Water District like any other applicant has to demonstrate a beneficial use for the water applied for under these applications and has to satisfy the other statutory requirements. The State Engineer finds if the Protestant Listers have an issue with the operation of the Lincoln County Water District that is a matter outside of the State Engineer's jurisdiction.

IV.

Through testimony and evidence, the Applicants' expert witnesses presented their interpretation of the geology and hydrogeology of the Kane Springs Valley and vicinity. They conclude that the northern portion of the valley is underlain by a volcanic caldera complex and,

[15] Chapter 474, Statutes of Nevada 2003.
[16] *Id.* at Sections 11(7), 11(11), and 11(12).

therefore, has low potential for regional ground-water flow. However, they interpreted the evidence as indicating that the southwestern portion of the basin is underlain by a significant thickness of carbonate rocks.[17] The Applicants conducted a pumping test at their well KPW-1 and, based on the results of the test and their interpretation of the geology, concluded that there is the potential for considerable ground-water movement through the Paleozoic carbonate rocks in Kane Springs Valley.[18] The Kane Springs Wash fault zone is oriented in a northeasterly direction, and is thought to both channel ground-water flow along its length from northeast to southwest, and to act as a barrier to ground-water flow across it from north to south. The witnesses also presented testimony supporting ground-water inflow into the Kane Springs Valley from the north.[19]

The State Engineer finds that the Applicants' interpretation of ground-water movement in the Kane Springs Valley from northeast to southwest and into Coyote Spring Valley, preferentially along the Kane Springs Wash fault zone, is generally consistent with the available data. The State Engineer further finds that the Applicants' pumping test supports the conclusion that there is considerable potential for ground-water flow in the carbonate rocks in the vicinity of well KPW-1. The State Engineer also finds that there was not sufficient evidence presented to support a determination of the potential for ground-water inflow into the Kane Springs Valley.

V.

The Applicants presented evidence to quantify subsurface inflow and outflow across the Kane Springs Valley Hydrographic Basin boundaries. The Applicants propose that ground water enters Kane Springs Valley from northern Coyote Spring Valley, passing through its western tip, and exits southwesterly back into Coyote Spring Valley. Local recharge is thought to combine with the inflow and exit the basin to the southwest. Since the water table is relatively deep in Kane Springs Valley and ET of ground water is negligible, virtually all ground-water discharge from the basin must occur via subsurface outflow.

Mr. Lewis applied Darcy's law to estimate the magnitude of the ground-water inflow into Kane Springs Valley Hydrographic Basin via a three-mile corridor on the western edge of Kane Springs Valley.[20] Darcy's law states the volume of flow is equal to aquifer transmissivity multiplied by aquifer width multiplied by the hydraulic gradient. He estimated transmissivity for

[17] Transcript, pp. 43-47, 57; Exhibit No. 15, pp. 13-14; Exhibit No. 20, pp. 3-4.
[18] Transcript, pp. 58-59, 62-63.
[19] Exhibit No. 20, pp. 6-13.
[20] Exhibit No. 20, pp. 6-13.

the "bulk aquifer" from the pumping test performed at the well identified as KPW-1. He then multiplied that value by three on the assumption that the aquifer is three times thicker than penetrated by the test well. For a value of hydraulic gradient, Mr. Lewis used water levels in wells CSVM-3 and CE-VF-2, which are located near the center of Coyote Spring Valley.

The State Engineer finds the Applicants' inflow analysis is overly interpretive and without sufficient supporting evidence. Inflow into the basin is proposed to occur through a three-mile wide zone on the western basin boundary. Flow direction is assumed to be from the north to south even though there are no local hydraulic head data to support the hypothesis of hydraulic gradient or flow direction. The Applicants' witness used hydraulic data from the KPW-1 pumping test, which is located approximately six miles from the proposed inflow area. The hydraulic gradient is assumed to be equal to that between wells CSVM-3 and CE-VF-2 even though these wells are located six and 15 miles away, respectively, from the proposed inflow zone. Inflow through the three-mile wide corridor is proposed by the Applicants to be 13,000 acre-feet per year. This amount is approximately one-third of the total amount of regional flow from Pahranagat and Delamar Valleys to Coyote Spring Valley of approximately 37,000 acre-feet per year.[21] However, the proposed flow corridor into Kane Springs Valley is a relatively narrow zone at the corner of the basin. Geologic structures in the area of the proposed inflow corridor strike north northeasterly, and may have the effect of channeling flow along them parallel to the basin boundary, similar to the conceptual model of the Applicants along the Kane Spring and Willow Spring fault zones. Geologic cross-section B-B' shows a thrusted block of low-permeability basement rocks that would act to block potential inflow.[22] The State Engineer finds that sufficient data does not exist to substantiate or reliably estimate subsurface flows into the Kane Springs Valley Hydrographic Basin and the Applicants' inflow estimates are hereby discounted and not accepted.

The Applicants' outflow analysis utilized two estimates of transmissivity from the KPW-1 pumping test. This analysis used a measured transmissivity of 50,000 gallons per day/foot (gpd/ft), which is thought to be representative of the regional carbonate aquifer and a transmissivity of 300,000 gpd/ft, which is thought to be representative of the local Willow Spring fault zone. The Applicants "scaled-up" the pumping test transmissivities to a basin scale by

[21] State Engineer's Office, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.
[22] Exhibit No. 15.

multiplying the values by three. Outflow is thought to occur in a southwesterly direction parallel to the axis of the Kane Springs Valley. The outflow corridor is estimated to be four-miles wide by 3,000 feet thick. They attribute one-half mile of the four-mile width to the fault zone and the remaining three and one-half miles to regional conditions, each having separate hydraulic gradients for their flow calculations. For the regional flow they used a gradient of 0.005, and for the structural zone they used a gradient of 0.0005. Total basin outflow was calculated to be 16,000 acre-feet per year.[23]

The State Engineer finds several irregularities and inconsistencies with the Applicants' analysis. The Applicants' hydrologist used a hydraulic gradient of 0.005 for the regional component of flow based on the water levels in wells CSVM-3 and CE-VF-2, which are located near the center of Coyote Spring Valley, rather than using a hydraulic gradient of 0.0004 for the regional component of flow based on water levels in wells KPW-1 and CSVM-4, which are located at the outflow of Kane Springs Valley Hydrographic Basin and better situated to measure the applicable gradient.[24] The Applicant calculated the regional component of outflow to be 15,000 acre-feet per year using the hydraulic gradient of 0.005 as opposed to an outflow calculation of 1,250 acre-feet per year using the lower hydraulic gradient of 0.0004. The State Engineer finds that using the higher hydraulic gradient of 0.005 to compute outflow from Kane Springs Valley Hydrographic Basin rather than using the lower gradient of 0.0004 between KPW-1 and CSVM-4 is in error and inconsistent with the Applicants' documented conceptual view of the flow system.[25]

The Applicants' estimate of outflow along the structural zone was computed separately using a transmissivity of 900,000 gpd/ft and a hydraulic gradient of 0.0005. The State Engineer finds the Applicant incorrectly approximated the hydraulic gradient to be 0.0005, and should have used a hydraulic gradient of 0.0004.[26] Based on the actual hydraulic gradient of 0.0004 the resulting basin outflow along the structural zone would then be 1,000 acre-feet per year. Adding the estimated outflow along the structural zone of 1,000 acre-feet per year to the regional flow of 1,250 acre-feet per year results in an estimated basin outflow of 2,250 acre-feet annually rather than the Applicants' calculation of 16,000 acre-feet annually.

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[23] Exhibit No. 16.
[24] *Ibid.*, pp. 20 and 31.
[25] Exhibit No. 17, p 21.
[26] Exhibit No. 20, p. 11.

The State Engineer finds the Applicants' inflow and outflow analyses lack sufficient data to provide a reliable estimate of basin boundary flows. Furthermore, he finds the Applicants' conceptual analyses were overly interpretive and, in part, were inconsistent with their conceptual model of regional flow. The State Engineer finds that sufficient data were not collected or presented to substantiate the Applicants' estimate of subsurface flow into or out of the Kane Springs Valley Hydrographic Basin.

VI.

The Applicant presented a witness to address the geochemical framework of the Kane Springs Valley Hydrographic Basin and the White River flow system south of the Pahranagat shear zone. The witness presented evidence on stable isotopes, major ion chemistry, and carbon-14 analyses.[27] In summary, the geochemical evidence supports the ground-water gradient data that indicates Kane Springs Valley ground water flows into Coyote Spring Valley and that, in general, water in the White River flow system flows from north to south and mixes with local recharge en route to discharge areas. The witness presented deuterium data collected from springs in Kane Springs Valley believed to represent local recharge water, springs in Pahranagat Valley believed to represent regional carbonate water, and ground water from KPW-1 believed to represent a mix of local recharge water and regional carbonate water. Using a mixing equation the witness computed the percent of regional carbonate ground water from the KPW-1 deuterium sample to equal 77 percent.[28] If the same analysis is repeated using oxygen-18 instead of deuterium, the percent of regional carbonate ground water from the KPW-1 oxygen-18 sample equals 87 percent.[29] As previously discussed, the reinterpretation of the Applicants' subsurface outflow analysis resulted in approximately 2,250 acre-feet per year of basin outflow from the Kane Springs Valley Hydrographic Basin. The State Engineer finds applying the percentages of regional carbonate ground water from KPW-1 for both the deuterium and oxygen-18 samples, the local ground-water recharge component of the outflow would therefore be approximately 518 acre-feet per year and 293 acre-feet per year, respectively. These values appear to support the reconnaissance estimate of 500 acre-feet per year of recharge, however, it is recognized that the re-interpreted outflow is only an estimate, and its value is limited due to uncertain hydraulic parameters.[30]

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[27] Testimony of R. Glanzman; Exhibit No. 32.
[28] Exhibit No. 117, p. 10.
[29] Exhibit No. 34, Table 1, p. 2.
[30] State Engineer's Office, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

VII.

Testimony and evidence was presented in an attempt to support a determination that significantly more water is locally recharged in the Kane Springs Valley Hydrographic Basin than previously reported. The Applicants presented Mr. Walker, who possesses a background in range management, as a witness who used plant communities as a method to estimate precipitation. However, Mr. Walker also testified that the use of plant communities as a method to calculate recharge does not exist, and his methodology for calculating recharge is not used anywhere else in the United States.[31] The Applicants then presented Mr. Lewis for the purpose of using Mr. Walker's estimation of precipitation for the establishment of new recharge estimates in the Kane Springs Valley Hydrographic Basin.[32]

Reconnaissance investigations by the U.S.G.S. estimate the combined recharge for Kane Springs Valley, Coyote Spring Valley and the Muddy River Springs Area to be 2,600 acre-feet annually.[33] Recharge for Kane Springs Valley was further delineated in 1971 and was estimated to be 500 acre-feet per year.[34] The methods and estimates presented by the Applicants in Exhibit Nos. 29 and 30 used four estimates of precipitation. With each of the four estimates of precipitation, ground-water recharge was then estimated using two methods: a version of the well-known Maxey-Eakin technique and a water budget method. In total, the Applicants computed eight recharge estimates ranging from 5,300 to 14,155 acre-feet per year[35]

One method for estimating precipitation tied plant communities to precipitation and elevation, and then used elevation zones to distribute precipitation throughout the basin. The second method used a spatial distribution of vegetative zones and their respective precipitation based on a United States Department of Agriculture, Natural Resource Conservation Service technical guide for ecological site descriptions.[36] A third precipitation method used PRISM[37]

[31] Transcript, pp. 244, 264.
[32] Transcript, pp. 245-246.
[33] T.E. Eakin, *Ground- water Resources – Reconnaissance Series Report 25, Ground-water Appraisal of Coyote Spring and Kane Spring Valleys and Muddy River Springs Area, Lincoln and Clark Counties, Nevada*, State of Nevada, Department of Conservation and Natural Resources, United States Department of Interior, Geologic Survey, February 1964.
[34] Transcript, p. 253.
[35] Exhibit No. 16, p. 5.
[36] Exhibit No. 29, pp. 6, 15-17.
[37] PRISM – Parameter-elevation Regressions on Independent Slopes Model and is a method of spatially distributing precipitation.

modeled precipitation.[38] The last precipitation estimate was based on a local altitude-precipitation method developed by the Las Vegas Valley Water District.[39] For each of these precipitation estimates, Mr. Lewis applied both a numerical form of the Maxey-Eakin technique and water budget approach for estimating recharge.

However, Mr. Halford, as expert witness for the Protestant National Park Service, testified that the use of the Maxey-Eakin technique in each of these cases was in error,[40] because using the Maxey-Eakin recharge coefficients with any precipitation estimates other than the Hardman precipitation map is inappropriate. The Maxey-Eakin recharge coefficients are married to the Hardman map and cannot be used otherwise.[41] Mr. Halford testified that if one is going to develop a new method of estimating recharge they must have the precipitation maps for the area of interest and controls on ground-water discharge, and then they can develop new recharge coefficients based on that information.[42]

The Applicants also used a water-budget approach with each of the precipitation estimates to arrive at an estimate of recharge. In the approach for Kane Springs Valley Hydrographic Basin, it was estimated that recharge is equal to precipitation less the sum of evapotranspiration (ET), surface runoff and spring discharge. Surface runoff and spring discharge were each estimated to average a few hundred acre-feet annually; therefore, recharge was estimated to be approximately equal to precipitation minus ET. Due to the lack of ET measurements or estimates of ET in Kane Springs Valley, the Applicants used data from a United States Geologic Survey report on evapotranspiration in Ruby Valley, over 200 miles to the north.[43] Their evidence provides that a report prepared by Berger in 2001 reports an estimate of ET using the Bowen-ratio method for an upland-shrub non-phreatophytic plant community of 12 inches per year where annual precipitation was estimated to be 13 to 15 inches.[44] On that basis, the Applicants assume 12 inches per year of ET for areas receiving 13 to 15 inches of precipitation in Kane Springs Valley and 13 inches per year of ET for areas receiving greater than 15 inches per year of precipitation.

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[38] Exhibit No. 29, p. 9.
[39] Exhibit No. 54, public administrative hearing before the State Engineer, July 16-20, 23-27, 2001, official records in the Office of the State Engineer.
[40] Transcript, pp. 489-520.
[41] Transcript, p. 493.
[42] Transcript, p. 495.
[43] Exhibit No. 29, p. 13.
[44] *Ibid.*

However, the State Engineer believes the Applicants misinterpreted and/or misapplied the data from the Berger 2001 report, which states that precipitation at the Ruby Lake National Wildlife Refuge site for the 2000 water year was only 7.74 inches, or 58 percent of the 1961 to 1990 30-year average of 13.3 inches.[45] During this same time period, ET at the upland-shrub site was 11.96 inches.[46] The report does not indicate what ET rates might be in the upland-shrub community during average precipitation years, although the data does support higher daily ET rates in the summer months when there was an increase in available soil moisture from precipitation.[47] In addition, the Applicants did not provide evidence suggesting that the ET rates in areas that receive greater than 15 inches per year would remain constant at 13 inches. The Applicants also did not address other factors that differ between Kane Springs Valley and Ruby Valley that could have an effect on ET rates such as differences in temperature, solar radiation, time and type of precipitation, and variable plant species distinct from those in Kane Springs Valley.

The State Engineer recognizes the difficulty in accurately estimating recharge and even the Applicants admit that estimates of recharge are extremely problematic as it is a parameter that cannot be measured directly.[48] The State Engineer agrees that recharge is a very difficult parameter to measure, and if it is used to determine perennial yield, the uncertainty in the estimates must be recognized and a conservative approach taken. Given the uncertainties inherent in estimating recharge and the validity in the testimony of the Protestant's expert stating that the recharge technique applied was in error and inappropriate, the State Engineer finds that the Applicants' evidence and testimony lack the scientific and practical basis to substantiate the proffered recharge of 5,000 to 14,000 acre-feet annually and are hereby discounted and not accepted. However, the State Engineer also recognizes that the current reconnaissance estimate of average annual recharge is probably low.

The Death Valley flow system area lies west and southwest of Kane Springs Valley. Because the Kane Springs Valley climate, latitude, geology and soil types are similar to the Death Valley flow system basins, it is reasonable to expect that similar precipitation amounts will result in

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[45] D.L. Berger, M.J. Johnson, M.L. Tumbusch, *Estimates of Evapotranspiration from the Ruby Lake National Wildlife Refuge Area, Ruby Valley, Northeastern Nevada, May 1999-October 2000,* Water-Resources Investigations Report 01-4234, United States Department of Interior, Geological Survey, Nevada Division of Water Resources and the United States Department of Interior, Fish and Wildlife Service, 2001.
[46] *Id.* at 25.
[47] *Id.* at 20.
[48] Transcript, p. 267.

similar amounts of ground-water recharge. Recharge within the Death Valley regional flow system has been calibrated to measured discharge, and therefore provides a greater level of certainty than recharge estimates made without a comparative discharge.[49] Several basins within the Death Valley regional flow system have similar amounts of precipitation as Kane Springs Valley with the ground-water recharge in those basins ranging from 1% to 2% of total precipitation.[50] Recent estimates of precipitation in the Kane Springs Valley range from 120,000 to 140,000 acre-feet per year as opposed to the Hardman estimate of 80,000 acre-feet per year.[51] Using a recharge to precipitation ratio of 1% to 2% as found in the Death Valley regional flow model for basins with similar amounts of precipitation, the recharge in Kane Springs Valley would be 1,200 to 2,800 acre-feet per year, which is substantially less than the Applicants' estimate of recharge of 5,000 to 14,000 acre-feet annually. This is a qualitative comparison, and is not proposed by the State Engineer to definitively estimate recharge in Kane Springs Valley, but serves as a barometer, for comparative purposes only, of recharge estimates in this area. The State Engineer finds recharge in Kane Springs Valley is uncertain, but is likely greater than the reconnaissance estimate of 500 acre-feet per year and less than the Applicant's estimates of 5,000 to 14,000 acre-feet per year.

VIII.

The perennial yield of a ground-water reservoir may be defined as the maximum amount of ground water that can be salvaged each year over the long term without depleting the ground-water reservoir. The perennial yield cannot be more than the natural recharge to a ground water basin and in some cases is less. In determining the amount of water available for appropriation in basins where outflow from one basin is part of the inflow to another basin, the State Engineer must take into consideration the amount of water appropriated in the upgradient basin and discount the amount from inflow into the downgradient basin. If the water appropriated in an upgradient basin is not deducted from the amount which discharges to the downgradient basin, it creates the potential for double accounting and regional over appropriation. Thus, the State Engineer is still able to manage the ground-water basins as they have been historically managed administratively, but also take into consideration the concerns that arise for ground-water basins that are hydrologically connected.

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[49] Belcher, W., ed., 2004 Death Valley Regional Ground-Water Flow System, Nevada and California – Hydrogeologic Framework and Transient Ground-Water Flow Model, USGS SIR 2004-4205.
[50] Belcher, W., ed., 2004, Death Valley Regional Flow Model, USGS SIR 2004-4205.
[51] Exhibit 16, p. 5.

The Applicants propose that ground water flows from upgradient basins through Kane Springs Valley into downgradient basins. In the case of the Kane Springs Valley Hydrographic Basin, the upgradient basin and the downgradient basin is the Coyote Spring Valley Hydrographic Basin. That is, ground water is proposed to flow from northern Coyote Spring Valley into Kane Springs Valley then back into Coyote Spring Valley. The Protestant NPS argues that the State Engineer should consider any inflow into Kane Springs Valley from the Coyote Spring Valley as previously allocated in Coyote Spring Valley and the subsequent outflow from Kane Springs Valley should be permitted to flow into Coyote Spring Valley in its entirety to meet the approximate 16,000 acre-feet per year of senior appropriated rights there. The majority of those senior water rights were issued with the intent to develop ground water from the White River regional carbonate-rock aquifer system. Given the unique hydrologic connection between the Kane Springs Valley Hydrographic Basin and the Coyote Spring Valley Hydrographic Basin, the development of ground water within Kane Springs Valley will ultimately affect water levels and flows in the White River regional carbonate-rock aquifer system. However, the State Engineer believes a small amount of water can be developed in the Kane Springs Valley and not unreasonably impact existing rights in the discharge areas of the White River carbonate-rock aquifer system, which are already fully appropriated. Well KPW-1 lies within 1,000 feet of Coyote Spring Valley and pumping simulations by the Applicant show a cone of depression extending well into Coyote Spring Valley. To further minimize potential effects on existing rights in the discharge areas of the White River carbonate-rock aquifer system, the State Engineer will limit the amount of ground water that can be pumped from wells in Kane springs Valley near the boundary with Coyote Spring Valley. After careful consideration of the uncertainties regarding the ranges of ground-water recharge, quantification of subsurface inflows and outflows, the demonstrated connection of Kane Springs Valley with the White River Regional flow system, and senior appropriated rights in the down-gradient basins, the State Engineer finds that 1,000 acre-feet is a reasonable amount to allow for appropriation from Kane Springs Valley.

IX.

Nevada Revised Statute § 533.370(5) provides that an applicant provide proof satisfactory to the State Engineer of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and his financial ability and reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence. Nevada Revised Statute § 533.375 provides that in the case of an application or multiple applications proposing to divert more than 10 cubic feet per second (such as the applications under consideration here) the State Engineer may require in the case of an incorporated company the submission of articles of incorporation, the names and places of residence of directors and officers and the amount of its authorized and paid-up capital. If the applicant is not an incorporated company, he may require a statement as to the name of the person proposing to construct the work, and a showing of facts necessary to enable him to determine whether the applicant has the financial ability to carry out the proposed work and whether the application has been made in good faith.

The Applicants presented the Chairwoman for the Lincoln County Water District, Rhonda Hornbeck, as a witness who testified that the Lincoln County Water District through its partner Vidler Water Company has an agreement with Coyote Springs Investment (CSI) to provide wholesale water to CSI's development. Additionally, the witness indicated they are working with the United States Department of Interior, Bureau of Land Management to gain a right of way to bring water from the wellhead down to the CSI property. The testimony indicated that a general improvement district is in place, as is a planned unit development.[52] The Applicants provided evidence on the plan of development, which is a report that was submitted to the United States Department of Interior, Bureau of Land Management, that identifies how the ground water will be withdrawn, how the pipes will be installed, what equipment is needed to complete the well and addresses the pipeline project to deliver the water to the place where it will be used, and pipeline permitting is underway.[53]

When questioned whether the Lincoln County Water District had the financial resources to place the water to beneficial use, the witness for the Lincoln County Water District provided several scenarios as to how those financial resources might be obtained, but did not provide any specific evidence of having the financial resources in place. The testimony indicated that the possibilities include: (1) floating a bond with its partner Vidler Water Company; (2) asking the State of Nevada

[52] Transcript, pp. 388-389; Exhibit No. 41; Exhibit No. 122 (Agreement dated Oct. 17, 2005, between Coyote Springs Investment, LLC and Lincoln County Water District and Vidler Water Company - marked as an exhibit after the hearing when document was filed upon request of the State Engineer.)
[53] Transcript, p. 95; Exhibit No. 26.

for a low-interest loan; or (3) a development agreement with CSI, where CSI would pay for the infrastructure to place the water to beneficial use; however the witness then testified there is already an agreement in place with CSI paying the cost of infrastructure.[54]

Dorothy-Timian Palmer, as a witness for the Applicants, testified that Vidler Water Company has already drilled a production well and a monitoring well and has spent a considerable amount of money on field work and analyses of that field work and has the financial ability to construct the work necessary to put the water to beneficial use.[55] The Agreement between CSI, the Lincoln County Water District and Vidler Water Company provides that CSI will purchase "all water available within the Kane Springs Basin." "Upon payment in full of the purchase price of Kane Water, the DISTRICT and VIDLER will convey the Kane Water by Water Rights Deed to CSI and will partially assign to CSI certain rights and delegate to CSI certain obligations related to the underlying water rights permit(s)."[56] The Applicants only intend to develop the water to the wellhead and CSI will develop the infrastructure to deliver the water from the wellhead to the development.[57]

Harvey Whittemore, as a witness for the Applicants, testified that within the CSI project there would be two separate general improvement districts. The one in Lincoln County has already been formed; however, the one in Clark County was to be formed in June 2006. The testimony indicated that the water rights already held by CSI will be assigned for the benefit of the general improvement districts and the Clark and Lincoln County Commissions will act as trustees for the general improvement districts. Mr. Whittemore indicated that the development is at a stage where all of the approvals necessary for the first phase of construction have been acquired with respect to Clark County. As to the Lincoln County portion of the project, it is still subject to the completion of a multi-species habitat conservation plan, as well as a number of additional approvals from federal agencies. The water rights at issue here would ultimately be owned by the developer CSI and then transferred to the Lincoln County General Improvement District.[58] CSI has already received approval in the form of parcel maps, zoning entitlement and development agreements for 49,000 units in Clark County and 110,000 units in Lincoln County.[59]

[54] Transcript, pp. 392-393.
[55] Transcript, pp. 458-461.
[56] Exhibit No. 122.
[57] Transcript, pp. 412-415.
[58] Transcript, pp. 419-420.
[59] Transcript, pp. 427, 439; Exhibit Nos. 43, 44, 45.

The State Engineer finds the Applicants provided proof satisfactory to the State Engineer of an intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and a reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.

X.

Testimony and evidence indicate there are no permitted or certificated groundwater rights in Kane Springs Valley Hydrographic Basin.[60] However, the witness for the NPS testified that Kane Springs Valley Hydrographic Basin and Coyote Spring Valley are hydrographically and hydrologically one and the same basin. Approximately 16,100 acre-feet have been appropriated in Coyote Spring Valley and applications are pending for another 200,000 acre-feet annually. Therefore, there is no water available for appropriation.[61] The State Engineer finds no water has been appropriated in Kane Springs Valley Hydrographic Basin and by limiting the quantity of water authorized for appropriation, the potential impacts to existing rights in down-gradient hydrographic basins will be minimized.

XI.

Nevada Revised Statute § 533.370(6) provides that in determining whether an application for an interbasin transfer of ground water must be rejected the State Engineer shall consider: (a) whether the applicant has justified the need to import water from another basin; (b) if the State Engineer determines that a plan for conservation of water is advisable for the basin into which the water is to be imported, whether the applicant has demonstrated that such a plan has been adopted and is effectively being carried out; (c) whether the proposed action is environmentally sound as it relates to the basin from which the water is exported; (d) whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported; and (e) any other factor the State Engineer determines is relevant.

Testimony was provided as to the extent of the project proposed in Coyote Spring Valley and estimates of the quantity of water necessary to carry out the project. That testimony satisfactorily addresses the provision of whether the applicant has justified the need to import water

[60] Transcript, pp. 208-209.
[61] Transcript, pp. 589-594.

from another basin.[62] Testimony was provided that indicated conservation measures are in place for the planned development similar to traditional development measures associated with development in southern Nevada that have been adopted and imposed,[63] and there is no evidence that the appropriation of water from Kane Springs Valley Hydrographic Basin will damage the environment of the valley.

Testimony was provided that indicated there is no private land within Kane Springs Valley Hydrographic Basin, rather all land within the valley is owned by the federal government; therefore, the use of the water will not unduly limit future growth and development in Kane Springs Valley Hydrographic Basin.[64]

The State Engineer finds the evidence does not support rejection of the application for an interbasin transfer of water.

XII.

Witnesses for both the Applicants (Glanzman)[65] and the Protestant NPS (Van Liew)[66] agree that the discharge at Rogers and Blue Point Springs in the Lake Mead National Recreation Area is not entirely carbonate-rock aquifer discharge, but is composed of some local precipitation that infiltrates and mixes with the carbonate-rock aquifer water that is flowing toward land surface along fault structures. Mr. Glanzman testified that in general when water in the White River flow system flows from north to south it mixes with local recharge en route to discharge areas at the Muddy River Springs Area and Rogers Springs and Blue Point Springs.[67] Using isotopic data, Mr. Glanzman estimated that approximately 25% of the discharge at Rogers Springs and Blue Point Springs could be characterized as regional carbonate water. For purposes of his analysis, Mr. Glanzman considered water in the carbonate aquifer of Pahranagat Valley to be 100% carbonate water.[68,69] Mr. Van Liew testified that discharge from the White River flow system appears to be predominantly at the Muddy River Springs, Rogers Springs and Blue Point Springs and raised the

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[62] Transcript, pp. 427-445.
[63] Transcript, pp. 428-429.
[64] Transcript, pp. 207-208.
[65] Transcript, pp. 115-203, 221-236.
[66] Transcript, pp. 523-621.
[67] Exhibit No. 34; Transcript, pp. 115 –203, 221-236.
[68] Transcript, pp. 137-138.
[69] Exhibit No. 117.

argument that there does not seem to be anywhere else for the ground water to flow. In addition, he doubted much water moved out to the Lake Mead area and testified that the ground-water gradient supports that conclusion.

The State Engineer finds there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs.

XIII.

By letter dated February 6, 2006, the NPS and FWS requested the State Engineer amend State Engineer's Order No. 1169 to include the Kane Springs Valley Hydrographic Area.[70] The reasoning behind the request is that these agencies believe Kane Springs Valley and Coyote Spring Valley, while administratively classified as separate hydrographic basins, are actually a single distinct hydrologic drainage basin and should be managed as such. However, during the public administrative hearing, the FWS indicated that the resolution of its protests pursuant to the Stipulation also goes to its statements in the February 6, 2006, letter. Thus, the Stipulation was presented in place of the FWS request to include Kane Springs Valley within the provisions of Order No. 1169.[71] However, the request by the NPS to include the Kane Springs Valley Hydrographic Basin within the provisions of Order No. 1169 still remains. Thus, two separate agencies within the United States Department of Interior take different positions with regard to the request to include Kane Springs within the provisions of Order No. 1169.

The witness for the Protestant NPS testified as to various reports and information that all conclude that the discharge from the Muddy River Springs is regional in nature, that a sufficient quantity does not come from local recharge to support the discharge and that a substantial portion of the discharge of the region is concentrated in the Muddy River Springs Area.[72] Citing to Exhibit No. 91, the witness noted that the writer of that report found that the "Coyote Springs Valley, Kane Springs Valley and the Muddy River Springs hydrographic areas (1,025 square miles) in southern Lincoln and Clark Counties have been combined for this report because the areas are hydrologically and topographically connected."[73] The faults in the area are believed to control the majority of

[70] Exhibit No. 10.
[71] Transcript, pp. 12-13.
[72] Transcript, pp. 530-581; *See*, Exhibit Nos. 87, 88, 91.
[73] Transcript, p. 533.

ground-water movement through the carbonate aquifer, including Kane Springs Wash fault zone, which the witness believes to be a conduit for flow to Coyote Spring Valley.[74] Additionally, the NPS witness believes that the Kane Springs Valley Hydrographic Basin and the Coyote Spring Valley are one hydrographic area.[75]

A witness for the Applicants indicated that there is a presumption that the Kane Springs Wash fault zone is effectively a no-flow boundary such that water flowing into Kane Springs Valley Hydrographic Basin flows out of Kane Springs Wash into Coyote Spring Valley, and that the water that is recharged in Kane Springs Valley Hydrographic Basin flows into Coyote Spring Valley.[76] Additionally, evidence developed from the well pump test and analyzed in conjunction with other evidence, such as the implication of a flat gradient, indicates a relatively high transmissivity across the southern half of the study area, indicating a high potential for regional ground-water flow.[77]

The State Engineer finds the evidence indicates a strong hydrologic connection between Kane Springs Valley and Coyote Spring Valley, specifically, that ground water flows from Kane Springs Valley into Coyote Spring Valley. However, carbonate water levels near the boundary between Kane Springs Valley and Coyote Spring Valley are approximately 1,875 feet in elevation, and in southern Coyote Spring Valley and throughout most of the other basins covered under Order No. 1169, carbonate-rock aquifer water levels are mostly between 1,800 feet and 1,825 feet. This marked difference in head supports the probability of a low-permeability structure or change in lithology between Kane Springs Valley and the southern part of Coyote Spring Valley. The State Engineer finds Order No. 1169 was issued to address the requests for the additional appropriation of water filed in Coyote Spring Valley, but the focus of the additional study ordered is the Muddy River Springs Area. The State Engineer finds there is not substantial evidence that the appropriation of a limited quantity of water in Kane Springs Valley Hydrographic Basin will have any measurable impact on the Muddy River Springs that warrants the inclusion of Kane Springs Valley in Order No. 1169. Therefore, the State Engineer denies the request to hold these applications in abeyance and include Kane Spring Valley within the provisions of Order No. 1169.

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[74] Transcript, pp. 545-550.
[75] Transcript, pp. 589-591.
[76] Transcript, pp. 291, 303.
[77] Transcript, pp. 329-330.

XIV.

The Applicants requested that the State Engineer act on Applications 72220 and 72221 and grant them for a total combined duty of 5,000 acre-feet annually and hold Applications 72218 and 72219 in abeyance. The State Engineer finds that the total amount of 1,000 acre-feet annually of groundwater available to be appropriated in Kane Springs Valley Hydrographic Basin is less than the requested 5,000 acre-feet annually; therefore the State Engineer finds he will not hold any of the applications in abeyance.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.[78]

II.

The State Engineer is prohibited by law from granting a permit to appropriate the public waters where:[79]

A. there is no unappropriated water at the proposed source;
B. the proposed use or change conflicts with existing rights;
C. the proposed use or change conflicts with protectible interests in existing domestic wells as set forth in NRS § 533.024; or
D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes that to permit the appropriation of water in an amount greater than permitted under this ruling will conflict with existing rights and threaten to prove detrimental to the public interest.

RULING

The protests to the applications are hereby upheld in part and overruled in part. Application 72220 is hereby granted for a duty of 500 acre-feet annually. Applications 72218, 72219, and 72221 are hereby granted for a total combined duty of 500 acre-feet annually.

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[78] NRS chapters 533 and 534.
[79] NRS 533.370(5).

Applications 72218, 72219, 72220, and 72221 are granted subject to:

1. The payment of statutory permit fees;
2. A monitoring plan to be approved by this office.

Respectfully submitted,

Tracy Taylor, P.E.

TRACY TAYLOR, P.E.
State Engineer

TT /jm

Dated this 2nd day of
February, 2007.

APPENDIX C

Applicant Proposed Environmental Protection Measures
and
Standard Construction and Operation Procedures

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
	Landscape Preservation and Impact Avoidance	
LP-1	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.	Wildlife habitat loss
LP-2	To the extent practicable, all maintenance yards, field offices, and staging areas will be arranged to preserve shrubs and other native vegetation.	Wildlife habitat loss
LP-3	Clearing will be restricted to that area needed for construction.	Wildlife habitat loss
LP-4	All areas around structures will be backfilled, compacted, and returned as close as possible to the original condition and grade.	Surface water quality from sedimentation
LP-5	In order to reduce environmental damage, washes, steep slopes, or sensitive environmental areas will not be used for equipment or materials storage or stockpiling; construction staging or maintenance; field offices; hazardous material or fuel storage, handling, or transfer; or temporary access roads.	Surface water quality from sedimentation and spills
LP-6	Excavated or graded materials will not be stockpiled or deposited on or within 100 feet of any steep slopes (defined by industry standards) or washes (including seasonally active ephemeral drainages) unless retention devices are installed to prevent sedimentation of these areas.	Surface water quality from sedimentation
LP-7	When and where applicable, landscaping standards, including clearing of native vegetation, will be followed as prescribed by local land use and management agencies when work is within their jurisdictions.	Surface water quality from sedimentation
	Erosion and Sediment Control	
ESC-1	Planting native grasses, forbs, or shrubs, or placing riprap and other materials as appropriate, will be used to prevent and minimize the potential for erosion and siltation during construction of project features and during the period needed to reestablish permanent vegetative cover on disturbed sites. Sediment fences will be used where appropriate to limit wind and water erosion, and water trucks will be used in disturbed areas during construction to limit wind erosion.	Loss of native vegetation

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
ESC-2	Final erosion control and site restoration measures will be initiated as soon as a particular area is no longer needed for construction, stockpiling, or access. Clearing schedules will be arranged to minimize exposure of soils.	Surface water quality from sedimentation
ESC-3	Cuts and fills for access roads and utility corridors will be sloped to prevent landslides and to facilitate revegetation.	Surface water quality from sedimentation
ESC-4	Signs will be placed along the access road to discourage OHV use of adjacent areas.	Loss of native vegetation
ESC-5	Borrow areas will be contoured and shaped to carry the natural contour of adjacent undisturbed terrain into the borrow area.	Surface water quality from sedimentation
ESC-6	Project construction and traffic will remain within the construction right-of-way, facility footprints, and approved access roads.	Surface water quality from sedimentation
ESC-7	Soil or rock stockpiles, excavated materials, or excess soil materials will not be placed near sensitive habitats, including washes, where they may erode into these habitats or be washed away by high water or storm runoff unless retention devices are installed to prevent sedimentation of these areas. Water, tackifier, or short-term stabilizers will be used as necessary to prevent wind erosion of soil stockpiles. Any permanent waste piles will be revegetated using suitable native species after they are shaped to provide a natural appearance.	Surface water quality from sedimentation
Pipeline and Utility Corridor Construction		
PUCC-1	Construction rights-of-way will be limited to the minimum practicable width.	Wildlife habitat loss
PUCC-2	If suitable for reclamation purposes, topsoil will be removed from the trench area and stockpiled for later use.	Loss of vegetation
PUCC-3	Surface elevations will be returned to pre-project conditions, taking into account expected settling.	Visual conflicts and erosion

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
	Biological Resources	
BR-1	Bird nests encountered during land disturbing construction activities will be avoided while the birds are fledging. To the extent practicable, land disturbing construction activities will be scheduled outside of the breeding season (March 15 through July 30). If construction is required during the breeding season, the area impacted will be surveyed for nests prior to construction.	MBTA violations
BR-2	Qualified biologists will survey for burrowing owl-nesting cavities prior to the nesting season and during construction if ground-disturbing activities will occur between mid-March and August. Empty nest-site burrows will be collapsed within the construction zone to mitigate direct impacts that may otherwise occur to burrowing owls. This will be accomplished, where appropriate, as part of the surveys for the desert tortoise. If owl-occupied burrows are located during their nesting or brooding season, burrows will be avoided until the young owls leave the nest or it is determined that the nesting attempt failed. Surveys for desert tortoise burrows will occur prior to construction activities and any unoccupied burrows will be collapsed and occupied burrows will be collapsed according to methods established during consultation with the appropriate federal and state agencies. If desert tortoise burrows are located that are suitable for burrowing owl-nesting cavities, they would not be collapsed prior to receiving authorization from the USFWS through a Section 7 take statement or Section 10 take permit.	Burrowing owl and desert tortoise mortality
BR-3	Gila monsters in immediate danger from construction activities will be captured and confined in a cool, shaded environment by a biologist in accordance with NDOW regulations. Injured Gila monsters will be transferred to a veterinarian. Dead Gila monsters will be preserved for NDOW.	Gila monster mortality
BR-4	Impacts to chuckwalla will be minimized by restricting activity in upland areas occupied by this species. Chuckwallas typically hide in rock crevices and other similar shelters when approached or threatened, making it difficult to capture and relocate them. However, trained personnel will remove them prior to construction if necessary.	Chuckwalla mortality
BR-5	Vegetation salvage and replanting will be implemented and completed as required by the BLM in accordance with their established guidelines. Adopting roadway signage that discourages off-road travel will help protect vegetation along road margins.	Loss of native vegetation Wildlife habitat loss

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
BR-7	Agency review and assessment of project-associated impacts on vegetation may precipitate a mitigation requirement to salvage various plants located inside the construction zone. Protected or otherwise sensitive plants (such as Joshua trees and numerous species of cactus and yuccas) will have to be identified and removed from the construction corridor prior to the onset of construction. Salvaged plants will then be held for replanting along construction zone margins, other project-affected areas (for example, former equipment staging grounds), or alternate lands. Plant salvage activities will probably have the greatest likelihood for success if carried out during times other than the spring flowering season.	Loss of native vegetation
BR-8	The project proponent will adhere to an integrated pest management plan prepared for the project.	Loss of native vegetation and spread of non-native species
BR-9	Except when not feasible, all project vehicle movement would be restricted to existing access roads and access roads constructed as a part of the project.	Loss of native vegetation and spread of non-native species Wildlife/vehicle collisions
BR-10	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.	Loss of native vegetation and spread of non-native species
BR-11	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 right-of-way following completion of construction.	Attraction of predators
BR-12	No wildlife, including rattlesnakes, may be harmed except to protect life and limb.	Wildlife mortality
BR-13	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 harassment

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
BR-14	Plant or wildlife species may not be collected for pets or any other reason.	Loss of native vegetation Wildlife harassment and take
BR-15	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.	Wildlife entrapment
BR-16	All steep-walled trenches or excavations used during construction shall be inspected twice daily (early morning and evening) to protect against wildlife entrapment.	Wildlife entrapment
BR-17	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.	Loss of native vegetation. Increased access and wildlife/vehicle collisions
BR-18	To minimize perching opportunities for raptors near habitats supporting sensitive prey species, structures incorporating a design to discourage raptor perching shall be selected.	Increased raptor predation
BR-19	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.	Loss of native vegetation and wildlife habitat loss
BR-20	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.	Wildlife entrapment
BR-21	Where necessary, a biological resource monitor shall be present during the construction to ensure that resources are protected in the construction area.	Loss of native vegetation and general wildlife impacts
BR-22	Heavy trucks and equipment shall be washed (including undercarriages) to limit the spread of noxious weed species.	Spread of non-native vegetation

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
BR-23	Excavations shall be sloped on one end to provide an escape route for small mammals and reptiles.	Wildlife entrapment
	Cultural Resources	
CR-1	A Programmatic Agreement is being developed among BLM, Nevada SHPO, and the LCWD. This Programmatic Agreement will contain stipulations to ensure that those historic and prehistoric properties eligible for nomination to the National Register of Historic Places will be treated to avoid or mitigate project-related effects to the extent practicable and to satisfy BLM Section 106 responsibilities.	Unanticipated discoveries: cultural resources
CR-2	Prior to initiating any ground disturbing activities within the APE the proponent must develop and submit to BLM a Construction, Operation and Maintenance Plan. BLM approval of the COM Plan will be contingent on inclusion of adequate measures to identify unanticipated discoveries of previously unidentified archaeological resources, historic properties, human remains, grave goods, items of cultural patrimony, sacred object or vertebrate fossil resource. Minimally the COM Plan will include a list of, and schedule for, the LCWD employees, contractors, and subcontractors empowered to halt all activities in a discovery of previously unidentified archaeological resources or historic properties. Furthermore the COM Plan will specifically identify who will be responsible for notifying BLM of any discoveries. At least one of these employees will be present during all LCWD construction and maintenance activities.	Unanticipated discoveries: cultural and paleontological resources
CR-3	As soon as there is a suspected discovery of previously undiscovered archaeological resources, historic properties, human remains, grave goods, items of cultural patrimony, sacred object or vertebrate fossil resource that may be damaged by construction activities all related activities will halt in the immediate vicinity of the discovery, and there after be directed away from a reasonable area in all directions from the point of discovery. Project personnel identified in the COM Plan will immediately notify the BLM authorized officer of the situation. The exposed resource shall be protected to the extent possible from damage until a BLM authorized officer can inspect the situation.	Unanticipated discoveries: cultural and paleontological resources

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
CR-4	The BLM shall notify the SHPO and/or federally recognized Tribe by phone and electronic message within 24 hours of being notified of the unanticipated discovery or unanticipated impact allowing a representative of the SHPO and/or a Tribal representative to accompany the BLM designated professional in assessment of the discovery, which shall occur within 48 hours of BLM acknowledgement that an unanticipated discovery notice has been received.	Unanticipated discoveries: cultural resources
CR-5	Within 24 hours of the professional on-site assessment the BLM authorized officer shall notify the SHPO or the Tribe, and the LCWA in writing of the findings of the on-site assessment and the decision to either allow construction activities to proceed or to require further evaluation or treatment.	Unanticipated discoveries: cultural resources
CR-6	If the BLM determines that treatment for unanticipated discoveries is required, the BLM shall have developed a treatment plan which will be provided to the SHPO or the Tribe for comment. The SHPO or the Tribe will have one week from receipt of the Unanticipated Discovery Treatment Plan to provide comments to the BLM. If no comments are received from the SHPO for the Unanticipated Discovery Treatment Plan the BLM will assume the SHPO or the Tribe considers the Plan sufficient and may allow the Plan to be implemented.	Unanticipated discoveries: cultural and paleontological resources
CR-7	Fieldwork and reports under Unanticipated Discovery Treatment Plans will be required to meet the standards and timeframes of other sections of this agreement unless otherwise specified in the BLM approved Unanticipated Discovery Treatment Plan.	Unanticipated discoveries: cultural and paleontological resources
CR-8	Any disputes or objections arising regarding an unanticipated discovery that cannot be resolved between the BLM and SHPO would be referred to the Advisory Council on Historic Preservation for mediation. Every effort shall be made to resolve disputes at the lowest level.	Unanticipated discoveries: cultural resources
CR-9	Kane Springs Valley Groundwater Development-related activities in the area of an unanticipated discovery will be halted until LCWD is notified by the BLM authorized officer in writing that treatment is complete and activities can resume.	Unanticipated discoveries: cultural and paleontological resources

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
	Reclamation	
R-1	Reclamation will normally be accomplished with native species only. These will be representative of the indigenous species present in the adjacent habitat. Rationale for potential planting with selected non-natives will be documented. Possible exceptions could include use of non-natives for a temporary cover crop to out-compete weeds.	Loss of native vegetation
R-2	Seeding will occur during November 15 through March 15 to ensure a greater chance of success.	Loss of native vegetation
R-3	Reclamation release criteria will follow NDEP guidelines specified in the Stormwater General Permit NVR 1000000. In general stabilization will be achieved when a site supports native perennial vegetation equal to 70 percent of total perennial cover in adjacent areas. Exceptions will be evaluated on a case-by-case basis with agency personnel.	Loss of native vegetation
R-4	No noxious weeds will be allowed on the sites for reclamation release. Control of noxious weeds will follow an integrated pest management plan approved by the authorizing officer. A list of Nevada noxious weeds will be provided by the authorized officer.	Spread of non-native vegetation
R-5	All available growth medium will be salvaged and stockpiled prior to disturbance. All disturbance areas will be recontoured to blend as nearly as possible with the natural topography prior to revegetation. All compacted portions of the disturbance will be ripped to a depth sufficient to relieve compaction as determined by Environmental Inspectors. Adequate, fine-grain seedbed must be established to provide good seed to soil contact. Large blocks and clumps of soil with deep pockets should be avoided. This normally requires some type of tillage procedure after ripping.	Loss of native vegetation
R-6	All portions of access roads not needed for other uses as determined by the authorized officer will be reclaimed.	Loss of native vegetation
R-7	Mulching of the seedbed following seeding may be required under certain conditions, such as severe erosion.	Loss of native vegetation

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
R-8	Revegetation success will be evaluated annually after construction. Where it has been determined that revegetation success criteria have not been met, the agencies and the operator will meet to decide on the best course of actions necessary to meet the reclamation goal.	Loss of native vegetation and spread of non-native species
R-9	Where applicable, the following agencies will be consulted to determine the recommended plant species composition, seeding rates, and planting dates: a. U.S. Fish and Wildlife Service b. U.S. Natural Resources Conservation Service c. U.S. Bureau of Land Management d.	Loss of native vegetation
R-10	Grasses, forbs and shrubs appropriate for site conditions and surrounding vegetation will be included on the plant list. Species chosen for a site will be matched for site drainage, climate, shading, resistance to erosion, soil type, slope, aspect, and vegetation management goals. Upland revegetation shall match the plant list to the site's soil type, topographic position, elevation, and surrounding natural communities.	Loss of native vegetation
R-11	Construction areas, including storage yards, will be free of waste material and trash accumulations at all times.	Removes hazardous materials and visual conflicts
R-12	All unused materials and trash will be removed from construction and storage sites during the final phase of work. All removed material will be placed in approved sanitary landfills or storage sites and work areas will be left to conform to the natural landscape.	Removes hazardous materials and visual conflicts
R-13	Upon completion of construction, any land disturbed will be graded to provide proper drainage and blend with the natural contour of the land. Following grading, it will be revegetated using plants native to the area, suitable for the site conditions, and beneficial to wildlife.	Loss of native vegetation
R-14	Following completion of construction, all yards, offices, and construction buildings, including concrete footings and slabs, will be removed from the site.	Visual conflicts

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
R-15	All temporary construction roads will be obliterated and restored to the original contour, and made to discourage vehicular traffic when no longer needed by contractors. Culverts will be removed as appropriate, road escarpments will be contoured and vegetated, and all road surfaces will be scarified to establish conditions appropriate for reseeding, drainage, and erosion prevention.	Loss of native vegetation
	Visual Resources	
V-1	All structures, stacks, buildings, and tanks will be constructed of materials that will restrict glare, and will be finished with flat tones intended to blend with the surrounding environment. The project applicant will consult with Lincoln County and BLM regarding the final selection of colors for the features of the property.	Strong color and texture contrasts of storage tanks and substation create visual conflicts in the landscape
V-2	Any Project facility fencing will be constructed of non-reflective materials, and will be treated or painted to blend with the surrounding environment.	Strong color and texture contrasts of fencing create visual conflicts in the landscape
V-3	Signage will be constructed of materials that are non-glare, and will be painted using unobtrusive colors.	Strong color contrasts create visual conflicts in the landscape.
V-4	Lighting will be limited to areas required for safety and security, and will be shielded and directed downward to the extent possible.	Night lighting at substation
V-5	Lighting will be directed and shielded to reduce light scatter and glare. Highly directional, high-pressure sodium vapor fixtures (or other fixtures that meet the criteria specified) will be used where practicable.	Night lighting at substation
V-6	Switches will be used as appropriate to allow use of lighting only when needed.	Night lighting at substation
V-7	Non-specular conductors and non-reflective and non-refractive insulators would be used to reduce conductor and insulator visibility.	Glare from overhead electric distribution lines

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
	Water Pollution Prevention and Monitoring	
WP- 1	A groundwater monitoring plan will be developed by LCWD and BLM and submitted to the Nevada State Engineer for approval. Results of monitoring will be provided to the FWS, BLM and the Nevada State Engineer at least annually and in accordance with requirements established by the Nevada State Engineer.	Groundwater quality and quantity
WP-2	All federal and state laws related to control and abatement of water pollution will be complied with. All waste material and sewage from construction activities or project related features will be disposed of according to federal and state pollution control regulations.	Water quality
WP-3	Activity with a high potential for causing sediment movement into washes will not be conducted during potentially high runoff periods, typically July and August without mitigation measures designed to anticipate, avoid, manage, and mitigate high runoff events.	Surface water quality from sedimentation
WP-4	All disturbed ephemeral washes will be reclaimed as soon as possible according to BMPs and any permit conditions. Native species capable of bank stabilization will be used to revegetate all disturbed banks as necessary.	Surface water quality from sedimentation
WP-5	Stormwater management plans will be implemented for project construction and facility operation to minimize and control erosion from stormwater runoff. Stormwater during project construction will be managed in compliance with applicable state and federal regulations, including compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater general permits, which will be obtained for the project. As determined by the Nevada Division of Environmental Protection, stormwater management elements may include: • Application of best management practices for erosion, sedimentation, and stabilization control during construction activities, and management of oils and other substances during operation to minimize contact with stormwater • Structural controls during operation and sedimentation detention basins • Monitoring and maintenance to ensure long-term effectiveness of the management system.	Surface water quality from sedimentation

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
WP-6	Pursuant to provisions in the Clean Water Act, projects that disturb 1 acre or more of land must also develop and implement a Stormwater Pollution Prevention Plan (SWPPP). Mitigation strategies to reduce impacts associated with stormwater runoff during construction will be implemented for this project.	Surface water quality from sedimentation
WP-7	Construction specifications will require construction methods that prevent entrance or accidental spillage of pollutants into flowing or dry watercourses, and ground water sources. Potential pollutants and wastes include refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products, aggregate processing tailings, mineral salts, drilling mud, and thermal pollution.	Water quality from spills
WP-8	Any construction wastewater discharged into surface waters will be essentially free of settling material. Wastewater from aggregate processing, concrete hatching, or other construction operation will not enter drainages without water quality treatment. Turbidity control methods may include settling ponds; gravel-filter entrapment dikes; recirculation systems for washing aggregates; or other approved methods.	Surface water quality from sedimentation
	Fire Mitigation	
F-1	Vegetation will be cleared from working areas on all roadways, equipment parking areas, and construction sites, including the Project right-of-way, as described in the Project POD and SWPPP.	Fire
F-2	Vehicles will not be driven or parked outside of these designated areas unless the site has been cleared of vegetation and other flammable materials.	Fire
F-3	Spark arrestors are required on vehicles and motorized equipment, such as chainsaws and other gas powered tools.	Fire
F-4	All welders will have an assistant who will monitor welding sites for embers or fires, in addition to their other construction activities.	Fire
F-5	At sites where cutting, welding, or grinding will occur, the vegetation must be cut to ground level or cleared for at least 25 feet in all directions.	Fire

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
F-6	Sites surrounding devices with combustion engines (e.g. generators and pumps) will be cleared of all vegetation for at least 25 feet in all directions beyond the size of the device.	Fire
F-7	The Contractors will provide an adequate supply of fire extinguishers, shovels, axes, pulaskies, and other tools to ensure that each crew member is equipped to participate in fire suppression. At sites where cutting, welding, or grinding occurs, there will be a minimum of: • one water-filled backpack pump; • one long handled shovel (at least 46 inches long); and • five pound ABC rated fire extinguisher within 25 feet.	Fire
F-8	Fire fighting tools will be contained in an area clearly labeled as fire fighting equipment that provides crew members with unrestricted access. In addition, water trucks and construction equipment will be available on-site for fire suppression.	Fire
F-9	All vehicles and equipment used by the Contractors will contain a 2-pound (or larger) fire extinguisher with an ABC rating and a long-handled shovel.	Fire
F-10	The Contractors will inspect each site following construction activity to ensure that there are no embers. Federal, state, and local fire control authorities may inspect sites within their jurisdiction and impose further fire prevention measures.	Fire
F-11	During the fire season, normally June thru September, it is incumbent on the Contractor to contact the BLM Wildfire Dispatch daily for current fire weather information. In the event that the National Weather Service issues a Red Flag warning for extreme fire weather conditions due to dry lightning, high winds, and/or low relative humidity; all construction activities with the possibility of starting a wildfire must cease.	Fire
	Noise and Air Pollution	
NA-1	Contractors will be required to comply with all applicable federal, state, and local laws and regulations concerning prevention and control of noise and air pollution. Contractors are expected to use reasonably available methods and devices to control, prevent, and reduce atmospheric emissions or discharges of atmospheric contaminants and noise.	Air pollutants and noise

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
NA-2	Contractors will obtain applicable air quality permits before starting construction or operating equipment that will result in regulated atmospheric emissions. Methods such as wetting exposed soil or roads with water or chemical dust suppressants where dust is generated by passing vehicles will be employed. Construction would comply with all the requirement of the dust permit.	Air pollutants, including fugitive dust
NA-3	Dust would be minimized by application of water to disturbed areas.	Fugitive dust
NA-4	During excavation, backfilling, contouring and rehabilitation, the disturbed soil should be wetted, chemically treated, or treated by other means satisfactory to the Authorized Officer, sufficiently in order to effectively reduce airborne dust and reduce soil erosion. A regular maintenance program shall include, but is not limited to, soil stabilization and reapplication of dust abatement methods as necessary.	Fugitive dust
NA-5	New roads would be built at right angles to washes to the extent practicable. Construction and maintenance activities would be conducted to minimize disturbance to vegetation and drainage channels. Existing roads would be left in or restored to a condition equal to or better than their condition prior to construction.	Erosion
NA-6	All new access roads not required for maintenance would be permanently closed using methods approved by the landowner/manager (e.g., stockpiling and replacing topsoil or rock replacement).	Fugitive dust, erosion
NA-7	All construction vehicle movement outside the right-of-way would be restricted to designated access or public roads. New access roads may be created if approved by the Authorized Officer. Routes for new access roads would be surveyed by the tortoise biologist prior to surface disturbance.	Fugitive dust, erosion, T&E
NA-8	All requirements of those entities having jurisdiction over air quality matters would be adhered to and any permits needed for construction activities would be obtained. Open burning of construction trash is not allowed.	Fugitive dust and other air emissions
NA-9	All project personnel would be educated the site dust mitigation plan.	Fugitive dust

<table>
<tr><th>REFERENCE NUMBER</th><th>APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES</th><th>RESOURCE</th></tr>
<tr><td>NA-10</td><td>Contractors will be required to reduce dust from construction operations and prevent it from causing a nuisance to people. To accomplish this, the following measures will be implemented:
• For the duration of construction activities, all actively disturbed areas, including roads and structure pads will be stabilized prior to and during all construction activities through the use of wet suppression as required to meet ambient air quality standards.
• Disturbed areas, including storage piles not being actively used for a period of 14 days or longer, will be stabilized as appropriate to minimize dust emissions. Active stabilization may not be required if soil moisture or natural crusting is sufficient to limit ambient impacts.
• Bulk material stored onsite that is a possible fugitive dust source will be actively wetted, as needed, to minimize ambient impacts. It is anticipated that the majority of the material will be used onsite upon arrival. Should bulk materials require onsite storage for an extended period of time, the application of active wet suppression or the installation of a porous wind fence will be used as necessary to minimize fugitive dust generation.
• Many of the unpaved surfaces, such as onsite access roads, will be covered with gravel and watered as necessary to minimize dust generation.
• Onsite fugitive dust emissions will be limited by reducing vehicle speeds and a combination of active and passive dust suppression measures. Additional mitigation practices will include the following:
  o Onsite access roads, parking lots, and lay-down areas will be maintained with a gravel cover to the maximum extent practical.
  o Traffic off maintained onsite access roads will be restricted and a posted speed limit of 15 miles per hour will be enforced to minimize dust emissions from unpaved road segments.
  o Unpaved road segments will be watered as necessary.
  o Gaseous emissions from mobile sources will be minimized by proper maintenance and tune-up of equipment.</td><td>Fugitive dust</td></tr>
</table>

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
	Hazardous Material Storage, Handling, Disposal, and Safety Measures	
HM-1	Contractors will be required to comply with Nevada State Regulations established under the authority of the Federal Resources Conservation and Recovery Act of 1976.	Water quality from spills and leaks
HM-2	"Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 USC 9601 et seq., and its regulations (CERCLA). The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended 42 USC 6901 et seq., and its regulations.	Water quality from spills and leaks
HM-3	Impacts from accidental spills would be addressed effectively through Spill Prevention Control and Countermeasure Plan and standard procedures, including training personnel in spill prevention and control techniques and requirements, maintaining appropriate spill control equipment, and complying with all hazardous materials management regulations.	Water quality from spills and leaks
HM-4	The potential for adverse impacts from oil and fuel spills will be reduced through careful handling and designation of specific equipment repair and fuel storage areas.	Water quality from spills and leaks
HM-5	Waste materials known or found to be hazardous will be disposed of in approved treatment or disposal facilities in accordance with federal, state, and local regulations, standards, codes, and laws.	Water quality from spills and leaks
HM-6	Solid waste will be stored in closed onsite roll-off bins. Recyclable materials will be separated from the solid waste stream. Solid waste will be collected periodically and transported to a local licensed landfill.	Water quality from spills and leaks
HM-7	Generation of wastes during construction will be minimized through detailed estimating of materials needed and through efficient construction practices. Any wastes generated during construction will be recycled as much as feasible. Concrete waste will be used as fill onsite, or, if not suitable for reuse, will be removed to a local licensed landfill. Any non-recyclable wastes will be collected and transported to a local licensed landfill.	Water quality from spills and leaks

REFERENCE NUMBER	APPLICANT PROPOSED ENVIRONMENTAL PROTECTION MEASURES	RESOURCE
HM-8	Fuels, lubricant chemicals, and welding gases used during construction will be in controlled storage until used. Any empty containers or waste material will be segregated in storage and properly recycled or disposed of by licensed handlers.	Water quality from spills and leaks
HM-9	Concrete trucks will not be washed at construction sites. All spilled concrete will be removed from construction areas and disposed of properly.	Water quality from spills and leaks
HM-10	Portable toilets will be provided for onsite sewage handling during construction and will be pumped out and cleaned regularly.	Water quality from spills and leaks
HM-11	To minimize the exposure of personnel and equipment to potential flood hazards, construction activities in the washes will be scheduled to occur when the probability for flash flooding is minimal.	Water quality from spills and leaks
HM-12	Hazardous material would not be drained onto the ground or into the streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such material. No debris of any kind would be deposited in or on the right-of-way.	Water quality from spills and leaks

APPENDIX D

Surface Water Rights within the Kane Springs Valley and Coyote Spring Valley Hydrographic Basins

CODE DEFINITIONS FOR WATER RIGHTS DATABASE

APPLICATION STATUS

ABN	ABANDONED
ABR	ABROGATED
APP	APPLICATION
CAN	CANCELLED
CER	CERTIFICATE
CUR	CURTAILED
DEC	DECREED
DEN	DENIED
EXP	EXPIRED
FOR	FORFEITED
PER	PERMIT
RFA	READY FOR ACTION
RFP	READY FOR ACTION (PROTESTED)
RLP	RELINQUISH A PORTION
REL	RELINQUISHED
RES	RESERVED
RVP	REVOCABLE PERMIT
RVK	REVOKED
SUP	SUPERCEDED
SUS	SUSPENDED
VST	VESTED RIGHT
WDR	WITHDRAWN
REJ	REJECTED

COUNTY

AL	ALPINE
CC	CARSON CITY
CH	CHURCHILL
CL	CLARK
DO	DOUGLAS
EL	ELKO
ES	ESMERALDA
EU	EUREKA
HU	HUMBOLDT
LA	LANDER
LI	LINCOLN
LY	LYON
MI	MINERAL
NY	NYE
PE	PERSHING
ST	STOREY
WA	WASHOE
WP	WHITE PINE

USE

COM	COMMERCIAL
CON	CONSTRUCTION
DEC	AS DECREED
DOM	DOMESTIC
DWR	DEWATERING
ENV	ENVIRONMENTAL
IND	INDUSTRIAL
IRC	IRRIGATION-CAREY ACT
IRD	IRRIGATION-DLE
IRR	IRRIGATION
MM	MINING AND MILLING
MUN	MUNICIPAL
OTH	OTHER
PWR	POWER
QM	QUASI-MUNICIPAL
REC	RECREATIONAL
STK	STOCKWATERING
STO	STORAGE
UKN	UKNOWN
WLD	WILDLIFE

SOURCE

EFF	EFFLUENT
GEO	GEOTHERMAL
LAK	LAKE
OGW	OTHER GROUND WATER
OSW	OTHER SURFACE WATER
RES	RESERVOIR
SPR	SPRING
STO	STORAGE
STR	STREAM
UG	UNDERGROUND
UKN	UKNOWN

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Water Rights within the Kane Springs Valley Hydrographic Basin

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Nevada Division of Water Resources

Hydrographic Abstract

Number of Records: 41

Selection Criteria: basin IN ('206')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion QQ	Q	SEC	TWN	RNG	Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
206	4750			11-30-17	CAN	SPR				09S	64E	0.100	STK	0.00	0.00		LI	WADSWORTH, C. I.
	6089			05-04-20	CAN	STR				09S	65E	16.000	IRR		0.00		LI	JOHN B. BRADSHAW CO.
	21662			11-26-63	CAN	UG	SE	SE	12	07S	65E	0.000		0.00	0.00		LI	STEWART, C.D.
	27926			11-29-73	CAN	SPR		SW	09	09S	65E	0.016	STK	0.00	11.20	AFA	LI	SUMMA CORPORATION
	27927			11-29-73	CAN	RES		NE	14	09S	64E	0.016	STK	0.00	11.23	AFA	LI	SUMMA CORPORATION
	71010			04-06-04	CAN	RES	NE	NE	24	10S	64E	0.000	WLD	0.00	0.00	AFA	LI	BLM
	4710		3396	11-19-17	CER	SPR	NE	NW	20	08S	65E	0.002	STK	0.00	0.95	AFS	LI	LDS
	5643		1528	07-29-19	CER	SPR	SW	SE	16	07S	66E	0.010	STK	0.00	7.28	AFA	LI	BALLOW, RACHAEL
	5879		1018	11-28-19	CER	SPR	SE	SE	15	07S	65E	0.003	STK	0.00	2.18	AFA	LI	LDS
	6007		676	03-05-20	CER	SPR	NW	NE	07	08S	65E	0.003	STK	0.00	2.18	AFA	LI	LDS
	6889		1250	04-28-23	CER	RES	NE	SE	35	09S	64E	0.000	STK	0.00	10.00	AFA	LI	RYAN, JAMES
	6890		1251	04-28-23	CER	SPR	NE	NE	28	09S	64E	0.002	STK	0.00	1.09	AFA	LI	RYAN, JAMES
	9924		2508	01-02-36	CER	SPR	SE	NE	24	08S	64E	0.005	STK	0.00	3.62	AFA	LI	HIKO LAND & CATTLE CO.
	10346		2702	03-20-39	CER	SPR	NE	SE	30	07S	66E	0.003	STK	0.00	1.63	AFS	LI	TENNILLE, GEORGE R.
	11427		3355	11-16-45	CER	SPR	NE	SE	24	08S	65E	0.003	STK	0.00	2.18	AFA	LI	LDS
	2923			03-24-14	DEN	UG	NE	NE	09	09S	65E	250.000	IRR		0.00		LI	GREAT WESTERN LAND, WATER & POWER CO
	5643	CHANGED BY: 52743			DEN	SPR												
	6203			07-14-20	DEN	SPR	NW	SW	29	08S	65E	0.100	STK	0.00	0.00		LI	GARDNER RANCH COMPANY
	52743	5643		11-30-88	DEN	SPR	SW	NE	26	07S	65E	0.007	STK	0.00	0.00		LI	BALLOW, RACHAEL
	R09412			04-06-04	RES	SPR	SW	NW	09	10S	64E	0.002	STK	0.00	0.00	AFA	LI	BLM
	72218			02-14-05	RFA	UG	SW	SE	25	08S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	72219			02-14-05	RFA	UG	SE	SW	31	09S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	72220			02-14-05	RFA	UG	SE	SW	06	11S	64E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	72221			02-14-05	RFA	UG	SE	SW	11	09S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT

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Selection Criteria: basin IN ('206')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion					Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
							QQ	Q	SEC	TWN	RNG							
	74147			04-10-06	RFP	UG	SW	SE	25	08S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	74148			04-10-06	RFP	UG	SE	SW	31	09S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	74149			04-10-06	RFP	UG	SE	SW	06	11S	64E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	74150			04-10-06	RFP	UG	SE	SW	11	09S	65E	6.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	V01359			03-22-15	VST	SPR	SW	SE	28	09S	65E	0.025	STK	0.00	0.00		LI	BALLOW, RACHAEL
	V01360			03-22-15	VST	SPR	SW	SE	16	08S	65E	0.025	STK	0.00	0.00		LI	BALLOW, RACHAEL
	V01361			03-22-15	VST	SPR	SE	SE	30	08S	65E	0.025	STK	0.00	0.00		LI	BALLOW, RACHAEL
	V01602			02-06-19	VST	SPR	NW	NW	25	08S	64E	0.025	STK	0.00	0.00		LI	GARDNER RANCH COMPANY
	V01603			02-06-19	VST	SPR	SW	SE	23	08S	64E	0.013	STK	0.00	0.00		LI	LOVE, H.E.
	V01718			07-14-20	VST	SPR	NW	NW	29	08S	65E	0.000	STK	0.00	0.00		LI	GARDNER RANCH CO.
	63416			09-10-97	WDR	SPR		LT0	06	07S	66E	0.010	STK	0.00	0.00		CL	TENNILLE, GEORGE R.
	64688			12-11-98	WDR	UG	SW	SE	25	08S	65E	10.000	IRR	0.00	0.00		LI	LINCOLN COUNTY WATER DISTRICT
		CHANGED BY: 71722			WDR	UG												
	64689			12-11-98	WDR	UG	SE	SW	31	09S	65E	10.000	IRR	0.00	0.00		LI	LINCOLN COUNTY WATER DISTRICT
		CHANGED BY: 71723			WDR	UG												
	71722	64688		09-22-04	WDR	UG	SW	SE	25	08S	65E	10.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT
	71723	64689		09-22-04	WDR	UG	SE	SW	31	09S	65E	10.000	MUN	0.00	0.00	AFA	LI	LINCOLN COUNTY WATER DISTRICT

Water Rights within the Coyote Springs Valley Hydrographic Basin

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Nevada Division of Water Resources

Hydrographic Abstract

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion					Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
							QQ	Q	SEC	TWN	RNG							
210	49608			12-30-85	ABR	UG	NW	NE	26	13S	63E	0.000	IND	0.00		AFA	CL	NEVADA POWER
	62462			09-13-96	ABR	SPR	E2	W2	24	11S	62E	0.000	MM	0.00	0.00	AFA	LI	BEDROC LIMITED
	4393			04-11-17	CAN	SPR	NW	NE	25	11S	63E	0.001	STK	0.00	0.55	AFA	LI	LAMB, WILLIAM S.
	4717			11-19-17	CAN	SPR	SE	SE	28	09S	63E	0.025	STK	0.00	0.55	AFA	LI	D. L. STEWART
	4769			12-10-17	CAN	RES			11	13S	63E	0.025	STK	0.00	0.00	AFA	CL	RICHARD, J. W.
	10477			03-18-40	CAN	STR	SE	NE	02	10S	62E	0.007	STK	0.00	5.00	AFA	LI	RICHARD J.W.
	16378			04-13-55	CAN	UG	NW	SE	15	10S	62E	8.000	IRD	320.00		AFA	LI	ROBERTS, HAROLD F.
	17892			03-19-59	CAN	SPR			15	15S	62E	0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	17893			03-19-59	CAN	SPR				15S	62E	0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	17894			03-19-59	CAN	SPR						0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	18079			06-23-59	CAN	SPR				15S	62E	0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	18080			06-23-59	CAN	SPR				15S	62E	0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	18081			06-23-59	CAN	UG				15S	62E	0.000	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	18890			05-31-60	CAN	SPR	SE	SE	30	14S	61E	0.000	STK	0.00	0.00		CL	USFWS
	25706			07-10-70	CAN	UG	SE	NW	13	11S	62E	0.500	COM	0.00	4.73	AFA	LI	C. S., INC.
	27925			11-29-73	CAN	RES		NE	07	09S	64E	0.000	STK	0.00	0.00		LI	SUMMA CORPORATION
	33073			08-08-77	CAN	UG	NW	NE	11	13S	63E	2.500	IRC	160.00	800.00	AFA	CL	BARNEBY, JEANNINE S.
	33074			08-08-77	CAN	UG	NE	NE	11	13S	63E	2.500	IRC	160.00	800.00	AFA	CL	BARNEBY, DAVID G.
	34096			10-13-77	CAN	UG	SW	SW	32	12S	63E	2.700	IRR	0.00	0.00		LI	BRADLEY, SUSAN L.
	34176			10-17-77	CAN	UG		NW	26	13S	63E	2.700	IRR	0.00	0.00		CL	GLORE, FRED
	34177			10-17-77	CAN	UG		NE	26	13S	63E	2.700	IRR	0.00	0.00		CL	GLORE, WAYNE JAMES
	34178			10-17-77	CAN	UG		SW	24	13S	63E	2.700	IRR	0.00	100.00	AFA	CL	SENA, ARSENIO G.
	34286			10-18-77	CAN	UG		SE	14	13S	63E	2.700	IRC	0.00	0.00		CL	SMART, FRED M.
	34300			10-19-77	CAN	UG		SW	14	13S	63E	2.700	IRC	0.00	0.00		CL	BRITZ, EARL F.
	38364			06-19-79	CAN	UG	NW	SW	17	15S	63E	5.400	IRR	0.00	0.00		CL	JOHNSON, MARILYN E.
	42864			11-20-80	CAN	UG	SE	NE	29	12S	63E	15.000	QM	0.00	0.00		LI	MX
	44720			10-29-81	CAN	UG	SE	NW	25	13S	63E	0.005	STK	0.00	0.00		LI	BLM
	45891			07-02-82	CAN	UG	SE	NE	29	12S	63E	16.200	IRD	0.00	0.00		CL	MOAPA BAND OF PAIUTES
	46627			02-10-83	CAN	UG	SE	SE	36	08S	63E	0.015	STK	0.00	5.52	AFS	LI	LDS WELFARE

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion QQ	Q	SEC	TWN	RNG	Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
	50409			12-10-86	CAN	UG	SW	NW	14	13S	63E	0.500	MM	0.00	0.00		CL	BARNELL MINING COMPANY
	3294		1391	03-08-15	CER	SPR	NW	SE	24	11S	63E	0.013	STK	0.00	8.96	AFA	LI	BALLOW, RACHAEL
	4213		468	11-11-16	CER	SPR	SW	NE	12	11S	61E	0.025	STK	0.00	18.08	AFA	LI	LAMB, WM. G.
	10449		2721	12-04-39	CER	RES	NE	NW	05	09S	64E	0.013	STK	0.00	8.96	AFA	LI	LDS
	10478		3946	03-18-40	CER	STR	SW	SE	11	10S	62E	0.007	STK	0.00	5.00	AFA	LI	BUCK HORN CATTLE CO
	11641		3370	07-26-46	CER	SPR	NE	SE	35	11S	61E	0.001	WLD	0.00	0.74	AFA	LI	USFWS
	11645		3366	07-26-46	CER	SPR	NE	SE	29	14S	61E	0.001	WLD	0.00	0.43	AFS	CL	USFWS
	12632		3791	09-13-48	CER	SPR	SE	NE	01	13S	61E	0.003	WLD	0.00	2.18	AFA	LI	USFWS
	13519		3785	10-16-50	CER	SPR	NW	NE	30	14S	61E	0.000	STK	0.00	0.06	AFA	CL	USFWS
	19306		6011	11-01-60	CER	SPR	SE	SE	30	14S	61E	0.001	STK	0.00	0.04	AFA	CL	USFWS
	19708		6069	03-31-61	CER	SPR	NE	SE	07	15S	62E	0.001	STK	0.00	0.06	AFA	CL	USFWS
	19709		6070	03-31-61	CER	SPR	NE	SW	12	15S	61E	0.001	STK	0.00	0.28	AFA	CL	USFWS
	1565			12-29-09	DEN	SPR			28	14S	61E	0.000	IRR	0.00	0.00		CL	KAISER LIVESTOCK
	1566			12-29-09	DEN	STR			13	15S	61E	0.000	IRR	0.00	0.00		CL	KAISER LIVESTOCK CO
	6362			12-23-20	DEN	SPR	SW	NE	24	11S	62E	2.000	IRR	0.00	0.00		LI	FOREMASTER, JOHN P.
	9818			11-23-34	DEN	SPR	NW	SW	28	14S	61E	0.025	STK	0.00	0.00		CL	WEST, RAYMOND A.
	10804			04-06-42	DEN	UG	NW	NE	11	13S	63E	0.025	STK	0.00	0.00		CL	BLACKBURN, LESLIE
	18402			10-30-59	DEN	SPR	NE	SW	12	15S	61E	0.001	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	18403			10-30-59	DEN	SPR	NE	SE	07	15S	62E	0.001	STK	0.00	0.00		CL	HENDRICKS, HELEN W.
	32947			07-28-77	DEN	UG	NW	SE	25	10S	62E	0.220	QM	0.00	0.00		LI	DESERT PARADISE INC.
	33067			08-08-77	DEN	UG	NW	NE	23	13S	63E	2.500	IRC	160.00	800.00	AFA	CL	CONGER, DORIS
	33068			08-08-77	DEN	UG	NE	NE	23	13S	63E	2.500	IRC	160.00	800.00	AFA	CL	CONGER, ERNEST R.
	33069			08-08-77	DEN	UG	SW	SE	11	13S	63E	2.500	IRC	160.00		AFA	CL	LEWIS, MALCOM LEE
	33070			08-08-77	DEN	UG	NE	SW	14	13S	63E	2.500	IRR	0.00	0.00		CL	LEWIS, LOIS
	33071			08-08-77	DEN	UG	NW	SW	14	13S	63E	2.500	IRC	160.00		AFA	CL	LEWIS, CLARVID A.
	33072			08-08-77	DEN	UG	NE	NW	14	13S	63E	2.500	IRC	160.00		AFA	CL	LEWIS, BARBARA
	34287			10-18-77	DEN	UG	SW	NE	23	13S	63E	2.700	IRC	0.00	0.00		CL	BRITZ, HERMAN
	34396			10-25-77	DEN	UG	NE	NE	26	13S	63E	2.700	IRC	0.00	0.00		CL	FULLER, DAVID PAUL
	34397			10-25-77	DEN	UG	NW	SE	26	13S	63E	2.700	IRC	0.00	0.00		CL	FULLER, LEONIE M.
	34398			10-25-77	DEN	UG	SE	SE	23	13S	63E	2.700	IRC	0.00	0.00		CL	HOLTON, VERA L.
	34581			11-07-77	DEN	UG	NE	SW	08	13S	63E	2.700	IRC	0.00	0.00		CL	CHABAFY, RITA T.
	34582			11-07-77	DEN	UG	NE	NW	17	13S	63E	2.700	IRC	0.00	0.00		CL	SZANTO, HUBERT S.
	34583			11-07-77	DEN	UG	SW	SE	08	13S	63E	2.700	IRC	0.00	0.00		CL	CHABAFY, ATTILA M.
	34584			11-07-77	DEN	UG	NW	NE	17	13S	63E	2.700	IRC	0.00	0.00		CL	PARKER, FRANCIS K.

Number of Records: 175 22 March 2007

Selection Criteria: basin IN ('210')

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion					Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
							QQ	Q	SEC	TWN	RNG							
	35198			03-20-78	DEN	UG	NW	NE	08	13S	63E	2.700	IRC	0.00	0.00		CL	LALLEMENT, MELVIN R.
	35199			03-20-78	DEN	UG	SE	SW	05	13S	63E	2.700	IRC	0.00	0.00		CL	HOPPER, MARGARET B.
	35200			03-20-78	DEN	UG	SW	SE	05	13S	63E	0.000	IRC	0.00	0.00		CL	LALLEMENT, GRACE M.
	35201			03-20-78	DEN	UG	NE	NW	08	13S	63E	2.700	IRC	0.00	0.00		CL	LALLEMENT, GRACIABEL H.
	37202			03-26-79	DEN	UG	NE	SE	11	13S	63E	0.000	IRD	0.00	0.00		CL	EARL, MILTON S.
	37207			03-26-79	DEN	UG	NE	SE	24	11S	62E	5.400	IRR	0.00	0.00		CL	EARL, DAN
	37208			03-26-79	DEN	UG	NW	NE	13	11S	62E	0.000	IRD	0.00	0.00		CL	EARL, LORNA
	37215			03-26-79	DEN	UG	NE	SE	23	13S	63E	5.400	IRD	0.00		AFA	CL	JOSEPH, KENNETH
	37253			03-27-79	DEN	UG	NE	SE	25	11S	62E	0.000	IRD	0.00	0.00		CL	LEAVITT, MARIA
	37276			03-28-79	DEN	UG	NW	SW	07	11S	63E	5.400	IRR	0.00	0.00		LI	MAX V. LEAVITT
	38556			07-16-79	DEN	UG	NE	SW	02	13S	63E	0.000	IRD	0.00	0.00		CL	LEAVITT, KATHY S.
	38557			07-16-79	DEN	UG	NW	NE	23	13S	63E	0.000	IRD	0.00	0.00		CL	LEAVITT, EARL
	40268			01-08-80	DEN	UG	NE	NW	14	13S	63E	0.000	IRD	0.00	0.00		CL	LEAVITT, EARL
	46915			05-17-83	DEN	UG	SE	SE	23	13S	63E	0.000	MM	0.00	0.00		CL	NATASHA MINING COMPANY
	46916			05-17-83	DEN	UG	NE	NW	25	13S	63E	0.000	MM	0.00	0.00		CL	NATASHA MINING COMPANY
	46917			05-17-83	DEN	UG	SE	SE	23	13S	63E	0.000	MM	0.00	0.00		CL	NATASHA MINING COMPANY
	49606			12-30-85	DEN	UG	SE	SE	23	13S	63E	10.000	IND	0.00		AFA	CL	NEVADA POWER
	49607			12-30-85	DEN	UG	SE	SE	23	13S	63E	10.000	IND	0.00		AFA	CL	NEVADA POWER
	49609			12-30-85	DEN	UG	NW	NE	26	13S	63E	10.000	IND	0.00		AFA	CL	NEVADA POWER
	49610			12-30-85	DEN	UG	NW	NW	25	13S	63E	10.000	IND	0.00		AFA	CL	NEVADA POWER COMPANY
	51912			03-10-88	DEN	UG	SW	NE	25	13S	63E	15.460	MM	0.00	0.00		CL	BLACK CANYON MINING CO.
	61459			08-11-95	DEN	UG	SE	NE	24	11S	62E	2.500	IRR	520.00	0.00		LI	BEDROC, INC.
	46777			03-31-83	PER	UG	SE	SE	23	13S	63E	0.800	IND	0.00	400.00	AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
		CHANGED BY:	70429		PER	UG												
			70430		PER	UG												
	49414			09-27-85	PER	UG	SE	SE	23	13S	63E	6.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49608	CHANGED BY:	69448		PER	UG												
	49660			01-27-86	PER	UG	SW	NW	13	11S	63E	0.138	IND	0.00	100.00	AFA	LI	SOUTHERN NEVADA WATER AUTHORITY

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion QQ	Q	SEC	TWN	RNG	Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
	49661			01-27-86	PER	UG	SE	NE	10	12S	63E	0.138	IND	0.00	100.00	AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49662			01-27-86	PER	UG	SE	NE	10	13S	63E	0.138	IND	0.00	100.00	AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49978			07-15-86	PER	UG	SW	NW	13	11S	63E	2.000	IND	0.00		AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49979			07-15-86	PER	UG	SE	SE	28	11S	63E	2.000	IND	0.00		AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49980			07-15-86	PER	UG	NE	NE	03	12S	63E	2.000	IND	0.00		AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49981			07-15-86	PER	UG	SE	NE	10	12S	63E	2.000	IND	0.00		AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49982			07-15-86	PER	UG	NW	SE	29	12S	63E	2.000	IND	0.00		AFA	LI	SOUTHERN NEVADA WATER AUTHORITY
	49983			07-15-86	PER	UG	NW	NW	03	13S	63E	2.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49984			07-15-86	PER	UG	SE	NE	10	13S	63E	2.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49985			07-15-86	PER	UG	NE	NE	20	13S	63E	2.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49986			07-15-86	PER	UG	NE	NE	21	13S	63E	2.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	49987			07-15-86	PER	UG	NE	NE	01	13S	63E	2.000	IND	0.00		AFA	CL	SOUTHERN NEVADA WATER AUTHORITY
	61458			08-11-95	PER	UG	SE	NW	24	11S	62E	0.500	MM	0.00	100.00	AFA	LI	BEDROC, INC.
		CHANGED BY:	70861		PER	UG												
			70862		PER	UG												
	62462		70860		PER	SPR												
	69448	49608		01-06-03	PER	UG	NE	NE	26	13S	63E	10.000	IND	0.00		AFA	CL	NEVADA POWER COMPANY
	70429	46777		09-24-03	PER	UG	SE	SW	14	13S	63E	3.000	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT LLC
		CHANGED BY:	74094		PER	UG												
	70430	46777		09-24-03	PER	UG	SW	SE	22	13S	63E	3.200	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT LLC
		CHANGED BY:	74095		PER	UG												
	70860	62462		01-30-04	PER	OGW	NW	SE	24	11S	62E	0.350	MM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion QQ	Q	SEC	TWN	RNG	Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
	70861	61458		01-30-04	PER	UG	SE	NW	24	11S	62E	0.250	MM	0.00	50.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	70862			01-30-04	PER	UG	NW	SE	24	11S	62E	0.250	MM	0.00	50.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	74094	70429		04-03-06	PER	UG	SW	SE	10	13S	63E	2.000	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT, LLC
	74095	70430		04-03-06	PER	UG	NW	NE	05	13S	63E	1.000	MUN	0.00	500.00	AFA	CL	COYOTE SPRINGS INVESTMENT, LLC
	70859	V04545		01-30-04	RFA	UG	NW	SE	24	11S	62E	0.350	IRR	0.00	100.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	71031			04-13-04	RFA	UG	NW	SE	24	11S	62E	0.350	COM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	V04545	CHANGED BY: 70859			RFA	UG												
	54055			10-17-89	RFP	UG	SE	SW	05	13S	63E	6.000	MUN	0.00		AFA	CL	LAS VEGAS VALLEY WATER DISTRICT
	54056			10-17-89	RFP	UG	SE	SE	32	13S	63E	6.000	MUN	0.00		AFA	CL	LAS VEGAS VALLEY WATER DISTRICT
	54057			10-17-89	RFP	UG	SE	NW	16	14S	63E	6.000	MUN	0.00		AFA	CL	LAS VEGAS VALLEY WATER DISTRICT
	54058			10-17-89	RFP	UG	NE	NE	01	13S	63E	10.000	MUN	0.00		AFA	CL	LAS VEGAS VALLEY WATER DISTRICT
	54059			10-17-89	RFP	UG	NW	NW	19	13S	64E	10.000	MUN	0.00		AFA	CL	LAS VEGAS VALLEY WATER DISTRICT
	62865			02-20-97	RFP	UG	SE	NW	13	11S	62E	0.500	MM	0.00	0.00		LI	C.S., INC.
	63272			07-24-97	RFP	UG	SE	SW	23	12S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63273			07-24-97	RFP	UG	SE	NE	25	12S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63274			07-24-97	RFP	UG	NE	NE	15	13S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63275			07-24-97	RFP	UG	SE	SE	23	12S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63276			07-24-97	RFP	UG	NE	SW	36	11S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63867			02-24-98	RFP	UG	NW	SW	12	13S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63868			02-24-98	RFP	UG	NW	SW	13	13S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion					Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
							QQ	Q	SEC	TWN	RNG							
	63869			02-24-98	RFP	UG	SW	SW	11	13S	63E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63870			02-24-98	RFP	UG	NE	SW	07	13S	64E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63871			02-24-98	RFP	UG	NW	SW	18	13S	64E	10.000	QM	0.00	0.00		CL	COYOTE SPRINGS INVESTMENT LLC
	63872			02-24-98	RFP	UG	SE	SW	11	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT LLC
	63873			02-24-98	RFP	UG	SW	SW	25	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT LLC
	63874			02-24-98	RFP	UG	SW	SW	13	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT LLC
	63875			02-24-98	RFP	UG	SW	SW	36	11S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT LLC
	63876			02-24-98	RFP	UG	NE	NE	22	11S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT LLC
	64039			04-17-98	RFP	UG	NE	SE	28	14S	63E	10.000	QM	0.00	0.00		CL	DRY LAKE WATER, LLC
	64186			06-03-98	RFP	UG	NW	SE	36	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64187			06-03-98	RFP	UG	SW	SE	35	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64188			06-03-98	RFP	UG	NE	SW	34	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64189			06-03-98	RFP	UG	NE	SW	27	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64190			06-03-98	RFP	UG	NW	NE	25	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64191			06-03-98	RFP	UG	NW	SW	24	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	64192			06-03-98	RFP	UG	NE	SW	26	12S	63E	10.000	QM	0.00	0.00		LI	COYOTE SPRINGS INVESTMENT, LLC
	67892			08-08-01	RFP	UG	NE	SE	28	14S	63E	10.000	QM	0.00	0.00	AFA	CL	DRY LAKE WATER, L.L.C.
	72838			05-26-05	RFP	UG	NW	SE	24	11S	62E	0.276	MM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	72839			05-26-05	RFP	UG	NE	SE	24	11S	62E	0.276	MM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	72840			05-26-05	RFP	UG	NW	SE	24	11S	62E	0.276	MM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC

Number of Records: 175

Selection Criteria: basin IN ('210')

22 March 2007

Basin	Application	Change of Application	Cert	File date	App status	Source	Point of Diversion					Diversion rate	Use	Irrigated Acres	Duty balance	Duty unit	CO	Owner name
							QQ	Q	SEC	TWN	RNG							
	72841			05-26-05	RFP	UG	NE	SE	24	11S	62E	0.276	MM	0.00	200.00	AFA	LI	BEDROC LIMITED, A NEVADA LLC
	V01353			03-08-15	VST	SPR	NE	SW	13	11S	62E	0.125	STK	0.00	3.38	AFA	LI	LDS
	V04545			10-24-85	VST	UG	E2	W2	24	11S	62E	0.350	IRR	0.00	4.00	AFS	LI	BEDROC LIMITED
	6363			12-23-20	WDR	SPR	NE	SW	24	11S	62E	2.000	IRR	0.00	0.00		LI	FOREMASTER, CARL E.
	6364			12-23-20	WDR	SPR	NE	SW	13	11S	62E	1.600	IRR	0.00	0.00		LI	RICHARD, JOHN W.
	14984			04-16-53	WDR	UG	SE	NE	10	09S	62E	3.000	IRR	160.00	800.00	AFS	LI	GRAINGER, BEN C.
	15543			03-08-54	WDR	UG	NW	SE	09	09S	62E	3.000	IRR	320.00		AFA	LI	WILLIAM W. ALLES
	15591			04-07-54	WDR	UG	NW	NE	09	10S	62E	6.000	IRR	0.00	0.00		LI	ALLES, WILLIAM W.
	15592			04-07-54	WDR	UG	SE	NE	10	10S	62E	6.000	IRR	0.00	0.00		LI	GRAINGER, BEN C.
	16550			06-06-55	WDR	UG	SE	SW	24	10S	62E	0.000	IRR	0.00	0.00		LI	BOLINDER, ANNA H.
	16551			06-06-55	WDR	UG	NE	NW	36	10S	62E	0.000	IRR	0.00	0.00		LI	AAMODT, MARGARET C.
	16552			06-06-55	WDR	UG		SW	25	10S	62E	0.000	IRR	0.00	0.00		LI	BOLINDER, JULIUS VERN
	16568			06-17-55	WDR	UG	NW	NW	23	10S	62E	0.000	IRR	0.00	0.00		LI	GOTTFREDSON, DAVID B.
	16769			10-21-55	WDR	UG	NE	NE	23	10S	62E	3.000	IRR	0.00	0.00		LI	GOTTFREDSON, IRMA G.
	43804			05-28-81	WDR	UG	NE	SE	29	12S	63E	0.000	QM	0.00	0.00		LI	MX
	44220			08-03-81	WDR	UG	SE	SE	23	13S	63E	0.000	QM	0.00	0.00		CL	MX
	70430	CHANGED BY:	72143T		WDR	UG												
			72144		WDR	UG												
			72170T		WDR	UG												
	72143T	70430		01-21-05	WDR	UG	NW	SW	22	13S	63E	4.200	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT, LLC
	72144			01-21-05	WDR	UG	NW	SW	22	13S	63E	4.200	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT, LLC
	72170T			01-28-05	WDR	UG	SE	SE	23	13S	63E	2.901	MUN	0.00		AFA	CL	COYOTE SPRINGS INVESTMENT LLC

APPENDIX E

E-1	Federally-Listed Species List from the U.S. Fish and Wildlife Service
E-2	BLM Sensitive Plant and Wildlife Species That May Occur Within or Near the Project Area
E-3	State of Nevada Classified Wildlife Species that May Occur Within or Near the Project Area
E-4	Common Wildlife Species That Are Expected to Occur Within or Near the Project Area
E-5	Risk Assessment for Noxious and Invasive Weeds

APPENDIX E-1

FEDERALLY-LISTED SPECIES LIST FROM USFWS

United States Department of the Interior

RECEIVED
of Land Management
A.M. MAY 1 1 2006
NEVADA STATE OFFICE
RENO, NEVADA

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Ph. (775) 861-6300 ~ Fax: (775) 861-6301

May 8, 2006
File No.1-5-06-SP-499

Memorandum

To: Project Manager, Nevada Groundwater Projects, Bureau of Land Management, Reno, Nevada

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Species List for the Proposed Kane Springs Valley Groundwater Development Project, Lincoln County, Nevada

In response to your letter received on April 10, 2006, the following federally listed species may occur in or near the subject project area:

- Southwestern willow flycatcher (*Empidonax traillii extimus*), endangered
- Moapa dace (*Moapa coriacea*), endangered
- Desert tortoise (*Gopherus agassizii*) (Mojave population), threatened
- Designated critical habitat for the desert tortoise
- Yellow-billed cuckoo (*Coccyzus americanus*) (Western U.S. distinct population segment), candidate

This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973 (Act), as amended, for projects that are authorized, funded, or carried out by a Federal agency. If it is determined by the Bureau of Land Management (BLM) that a listed species may be affected by the proposed project, then formal consultation should be initiated pursuant to 50 CFR § 402.14. The written request for formal consultation is typically submitted once a Biological Assessment (BA) has been prepared for the project. Formal consultation is initiated by the Service on the date the written request and BA is received, if the Service determines the information received is sufficient. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to listed species. Please note that candidate species receive no legal protection under the Act, but could be proposed for listing in the near future. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions.

Project Manager File No. 1-5-06-SP-499

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern are also on the sensitive species list for the State of Nevada maintained by the Nevada Natural Heritage Program (Heritage). Instead of maintaining our own list, we have adopted Heritage's sensitive species list and partnered with them to provide distribution data and information on the conservation needs for sensitive species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. Consideration of these sensitive species and exploring management alternatives early in the planning process can provide long-term conservation benefits and avoid future conflicts.

For a list of sensitive species by county, visit Heritage's website (www.heritage.nv.gov). For a specific list of sensitive species that may occur in the project area, you can obtain a data request form from the website or by contacting Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245; 775-684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the Act. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address. Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (http://www.leg.state.nv.us/NAC/NAC-503.html). Before a person can hunt, take, or possess any parts of wildlife species classified as protected, they must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (http://www.ndow.org; 702-486-5127).

Please reference File No. 1-5-06-SP-499 in future correspondence concerning this species list. We will be providing scoping comments in the near future that will outline in more detail our concerns regarding the project and the potential affect to species and their habitat. In the mean time, if you have any questions regarding this correspondence or require additional information, please contact me or Annalaura Averill-Murray at (775) 861-6300.

Cynthia T. Martinez

for Robert D. Williams

APPENDIX E-2

BLM SENSITIVE PLANT AND WILDLIFE SPECIES THAT MAY OCCUR WITHIN OR NEAR THE PROJECT AREA

Common Name	Scientific Name	Habitat	Potential for Occurrence
Plants			
Sheep Mountain milkvetch	*Astragalus amphioxys var. musimonum*	Carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced run-off, in mixed desert shrub communities.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Black woollypod	*Astragalus funereus*	Dry, open scree, talus, or gravelly alluvium derived from light-colored volcanic tuff, on east, south less commonly west, rarely north aspects.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Gilman milkvetch	*Astragalus gilmanii*	On light-colored volcanic tuff slopes in pinyon-juniper woodland.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Currant milkvetch	*Astragalus uncialis*	Dry, open, sparsely-vegetated, calcareous sandy-clay soils on flats and gentle slopes of hillsides and alluvial fans.	No known occurrences near pipeline corridor; population very localized.
Cane Spring suncup	*Camissonia magalantha*	Generally dry, open, loose soils on sandy to gravelly flats, slopes, or scree, sometimes in outcrop crevices derived mainly from whitish to brownish volcanic tuff or tuffaceous sedimentary deposits, usually in places with frequent light disturbance such as shifting slopes, washes, roadsides (or in lightly used road beds), or on older recovering disturbances, mainly in salt desert shrub communities.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Sanicle biscuitroot	*Cymopterus ripleyi var. saniculoides*	Loose sandy to gravelly, often somewhat alkaline soils on volcanic tuff deposits and mixed valley alluvium, typically in small drainage-ways, in the blackbrush, mixed-shrub, sagebrush, and lower pinyon-juniper zones.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Sheep fleabane	*Erigeron ovinus*	Crevices in carbonate cliffs and ridgeline outcrops in the pinyon-juniper and montane conifer zones.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Sunnyside green gentian	*Frasera gypsicola*	Open, dry, whitish, alkaline, often salt-crusted and spongy silty-clay soils on calcareous flats and barrens, with little if any gypsum content, in cushion-plant associations surrounded by sagebrush, greasewood and occasionally barberry and swamp cedar (Juniperus scopulorum) vegetation, with Artemisia pygmaea, A. tridentata, Eriogonum shockleyi, Physaria chambersii, Cryptantha welshii, Hymenopappus filifolius, Phlox tumulosa, lepidium nanum.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Rock purpusia	*Ivesia arizonica var. saxősa*	Crevices of cliffs and boulders on volcanic and possibly carbonate rocks in the upper mixed-shrub, sagebrush and pinyon-juniper zones.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Waxflower	*Jamesia tetrapetala*	Crevices in limestone cliffs.	No suitable habitat in the project area; no known occurrences near pipeline corridor.
Tiehm blazingstar	*Mentzelia tiehmii*	Mostly on hilltops of white soil, sparsely vegetated white calcareous knolls and bluffs with scattered perennials. Occurring with: Artemisia nova, Atriplex confertifolia, Enceliopsis nudicaulis var. nudicaulis, Lepidium nanum, Chrysothamnus parryii var. asper, Hymenopappus filifolius var. nanus, Phlox tumulosus.	No suitable habitat in the project area; no known occurrences near pipeline corridor.
Tunnel Springs beardtongue	*Penstemon concinnus*	Sandy to gravelly loams in pinyon-juniper with big sage and Nevada ephedra. Known from a western exposure with 0-5 degree slope.	No suitable habitat in the project area; no known occurrences near pipeline corridor.
Beatley scorpion plant	*Phacelia beatleyae*	Dry, open, nearly barren scree and loose gravelly soils on slopes and bases of white to brownish volcanic tuff outcrops on all slopes and aspects, and in adjacent drainages, in the mixed-shrub, blackbrush, shadscale, and upper creosote-bursage zones.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Pygmy poreleaf	*Porophyllum pygmaeum*	Dry, open relatively deep, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions, low benches adjacent to minor drainages, or other moisture-enhanced microsites, in the blackbrush, mixed shrub, and lower pinyon-juniper zones.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Nachlinger catchfly	*Silene nachlingerae*	Generally dry, exposed or somewhat sheltered carbonate (rarely quartzite) crevices in ridgeline outcrops, talus or very rocky soils on or at the base of steep slopes or cliffs, on all aspects but predominantly on northwesterly to northeasterly exposures, mainly in the subalpine conifer zone with sparse Petrophytum caespitosum, Erigeron cf. simplex, Pinus flexilis, P. longaeva, Artemisia arbuscula, Cercocarpus betuloides, Ericameria watsonii, Symphoricarpos oreophila, Leucopoa nevadensis, Jamesia tetrapetala, Primula nevadensis.	No suitable habitat in the project area; no known occurrences near pipeline corridor; elevation range higher than pipeline corridor.
Currant summit clover	*Trifolium andinum var. podocephalum*	Crevices of volcanic or carbonate rock in the pinyon-juniper zone.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized.
Rock violet	*Viola lithion*	Seasonally wet crevices in steep carbonate or quartzite outcrops in shaded northeast-facing avalanche chutes and cirque headwalls in the subalpine conifer zone with Symphoricarpos oreophilus, Ribes montigenum, Heuchera rubescens, Aquilegia scopulorum, Thalictrum ferndleri, Pinus flexilis, Populus tremuloides, etc.	No suitable habitat in the project area; no known occurrences near pipeline corridor; population very localized; elevation range higher than pipeline corridor.
White bearpoppy	*Arctomecon merriamii*	On a wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum calcareous alluvial gravels, and carbonate rock outcrops.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Meadow Valley sandwort	*Arenaria stenomeres*	Carbonate cliffs, ledges, canyon walls, and rocky slopes on all aspects, above the Larrea tridentata zone.	Potential habitat occurring in the project area; survey did not locate individuals or populations.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Eastwood milkweed	*Asclepias eastwoodiana*	In open areas on a wide variety of basic (pH usually 8 or higher) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition, frequently in small washes or other moisture-accumulating microsites, in the shadscale, mixed-shrub, sagebrush, and lower pinyon-juniper zones.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
One-leaflet Torrey milkvetch	*Astragalus calycosus var. monophyllidius*	Decaying carbonate derived young soils, with sparse vegetation in sagebrush and piñon-juniper communities.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Needle Mountain milkvetch	*Astragalus eurylobus*	Generally deep, barren, sandy, gravelly, or clay soils derived from sandstone or siliceous volcanics frequently in or along drainages.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Straw milkvetch	*Astragalus lentiginosus var. stramineus*	Similar to Sticky buckwheat: Deep loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas, with Ambrosia dumosa, Larrea tridentata, Pleuraphis rigida, Krameria parvifolia, Achnatherum hymenoides, Tamarix ramosissima, Tessaria sericea, Astragalus geyeri var. triquestrus, A. sabulonum, Eriogonum trichopes, Ephedra torreyana, Dicoria canascens, Pediomelum, Croton californicus, Sporobolus cryptandrus, Psorothamnus fremontii, Abronia, Tiquilia, etc. Can withstand moderate temporary disturbance. Dependent on sand dunes or deep sand in Nevada.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Halfring milkvetch	*Astragalus mohavensis var. hemigyrus*	Carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes in the creosote-bursage, blackbrush, and mixed shrub zones.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Remote rabbitbrush	*Chrysothamnus eremobius*	Crevices or rubble of north-facing carbonate cliffs in and just below the pinyon-juniper-sagebrush zone with Cercocarpus intricatus, Hecostocleis shockleyi, Rhus trilobata, Petradoria, etc.	Potential habitat occurring in the project area; survey did not locate individuals or populations.

Common Name	Scientific Name	Habitat	Potential for Occurrence
White River catseye	*Cryptantha welshii*	Dry, open, sparsely vegetated outcrops, and derived sandy to silty or clay soils, of whitish calcareous or carbonate deposits, often forming knolls or gravelly hills, and on soils adjacent to such habitats, mostly in Juniperus-Artemisia-Chrysothamnus vegetation with Artemisia pygmaia, Stenotus acaulis, Eriogonum shockleyi, Hymenopappus filifolius, Physaria, Erigeron compactus, Enceliopsis nudicaulis, Lepidium nanum, L. montanum, Linum perenne, Stanleya pinnata, Hilaria jamesii, Astragalus calycosus, Leucelene ericoides, Phlox tumulosa, Frasera albomarginata.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Las Vegas buckwheat	*Eriogonum corymbosum*	On or near gypsum soils, often forming low mounds or outcrops in washes and drainages.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Clokey buckwheat	*Eriogonum heermannii var. clokeyi*	Carbonate outcrops, talus, scree, and gravelly washes and banks in the creosote-bursage, shadscale, and blackbrush zones.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Scarlet buckwheat	*Eriogonum phoeniceum*	White tuffaceious knolls, bluffs, and rocky flats, openings in pinyon and juniper woodland, with Artemisia tridentata, Purshia tridentata, Petradoria pumila, etc.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Sticky buckwheat	*Eriogonum viscidulum*	Deep loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas, with Ambrosia dumosa, Larrea tridentata, Pleuraphis rigida, Krameria parvifolia, Achnatherum hymenoides, Tamarix ramosissima, Tessaria sericea, Astragalus geyeri var. triquestrus, A. sabulonum, Eriogonum trichopes, Ephedra torreyana, Dicoria canascens, Pediomelum, Croton californicus, Sporobolus cryptandrus, Psorothamnus fremontii, Abronia, Tiquilia, etc. Can withstand moderate temporary disturbance. Dependent on sand dunes or deep sand in Nevada.	Potential habitat occurring in the project area; survey did not locate individuals or populations.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Pioche blazingstar	*Mentzelia argillicola*	Dry, soft, silty clay soils on knolls and slopes with sparce vegetation consisting mainly of Artemisia pygmaea, Eriogonum nummulare, Gutierrezia sarothrae, Salvia dorrii var. dorrii.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Beaver dam breadroot	*Pediomelum castoreum*	Dry, sandy deserts.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Beatley scorpion plant	*Phacelia beatleyae*	Dry, open, nearly barren scree and loose gravelly soils on slopes and bases of white to brownish volcanic tuff outcrops on all slopes and aspects, and in adjacent drainages, in the mixed-shrub, blackbrush, shadscale, and upper creosote-bursage zones.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Clarke phacelia	*Phacelia filiae*	Flat areas or low knolls of valley floors and foothills of desert mountains on light colored soils including calcareous sandstone, siltstone, tuffaceous claystone, and limestone occurring with shadscale, blackbrush, and creosote.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Parish phacelia	*Phacelia parishii*	Moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted silty-clay soils on valley bottom flats, lake deposits, and playa edges, often near seepage areas, sometimes on gypsum deposits, surrounded by saltbush scrub vegetation but with few immediate associates such as Atriplex confertifolia, A. canescens, A. agrentea, Poa secunda, Monolepis nuttalliana, Phacelia fremontii, Lepidium flavum, Sarcobatus vermiculatus, etc. Aquatic or wetland dependent in Nevada.	Potential habitat occurring in the project area; survey did not locate individuals or populations.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Schlesser pincushion	*Sclerocactus schlesseri*	Open, stable or stabilized, gravelly, sandy silt or silty clay soils derived from somewhat ashy and/or gypsiferous lacutrine sediments, on mesic microsites created and/or maintained by gentle north to east aspects, dense shrub and/or grass canopies, high clay and silt content of the soil, and /or cryptobiotic soil crusts, usually associated with such soil crusts in the shadscale zone with Atriplex confertifolia, Gutierrezia sarothra, Ericameria viscidiflora puberla, Krasheninnikovia lanata, Pleuraphis jamesii, Montpelier albicaulis, Mimulus parryii, etc.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Jones globemallow	*Sphaeralcea caespitosa*	Sevy Dolomite rock calcareous soil, mixed shrub, pinyon-juniper and grass community.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
Charleston grounddaisy	*Townsendia jonesii var. tumulosa*	Open, sparsely vegetated calcareous areas, on shallow gravelly carbonate soils on slopes and exposed knolls in forest clearings mostly in the montane conifer zone with Pinus ponderosa, extending to the pinyon-juniper, mountain mahogany, and lower subalpine conifer zones, recurring on knolls of whate, alkaline, calcareous, silty lacustrine deposits in the upper shadscale/mixed-shrub and lower sagebrush zones.	Potential habitat occurring in the project area; survey did not locate individuals or populations.
		Mammals	
Pallid bat	*Antrozous pallidus*	Roosts in cave, mine shafts, bridges, buildings, and trees; forages in woodlands, over water, and desert washes	Potentially occurring throughout the project area.
Pygmy rabbit	*Brachylagus idahoensis*	Dense stands of big sagebrush growing in deep loose soils.	No suitable sage brush habitat in the project area.
Big brown bat	*Eptesicus fuscus*	Roosts in buildings, hollow trees, and rock crevices. Occurs in wooded and semi-open habitats, typically with deciduous trees but also in conifer forests.	No potential habitat in the project area.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Spotted bat	*Euderma maculatum*	Roosts in caves, crevices, talus, trees, bridges, and buildings; forages over water, and in desert washes, and woodlands	Potentially occurring throughout the project area.
Silver-haired bat	*Lasionycteris noctivagans*	Roosts in trees, caves, mine shafts, bridges, and buildings, and forages over water and in woodlands	No potential habitat in the project area.
Western red bat	*Lasiurus blossevillii*	Wooded habitats	No potential habitat in the project area.
Hoary bat	*Lasiurus cinereus*	Roosts in trees, cliffs, mines, caves, and talus; forages over water and in woodlands	No potential habitat in the project area.
Desert Valley kangaroo mouse	*Microdipodops megacephalus albiventer*	Occurs in loose sands and gravel of shadscale scrub, sagebrush scrub, and alkali sink plant communities	Known to occur near the project area.
Pahranagat Valley montane vole	*Microtus montanus fucosus*	Low elevation wet valleys	No potential habitat within the project area.
California myotis	*Myotis californicus*	Roosts in caves, crevices , talus, trees, bridges, and buildings; forages over water, and in desert washes, and woodlands	Potentially occurring throughout the project area.
Small-footed myotis	*Myotis ciliolabrum*	Desert, badland, semidesert, and desert mountain habitats from 1,000 to 11,000 feet, typically found in desert scrub	Potentially occurring throughout the project area.
Little brown myotis	*Myotis lucifugus*	Prefers to forage over water. Usually hibernates in caves and mines, often roosts and breeds in Buildings	No potential habitat within the project area.
Fringed myotis	*Myotis thysanodes*	Forages in desert scrub and piñon-juniper woodlands; breeds and roosts in mines, building, rock crevices, caves and under tree bark	Potentially occurring throughout the project area.
Long-legged myotis	*Myotis volans*	Piñon-juniper woodlands and ponderosa pine forests; roosts in trees, caves, mine shafts, cliffs, crevices, abandoned buildings, and under bridges; forages over water	No potential habitat in the project area.
Yuma myotis	*Myotis yumanensis*	Roosts in trees, caves, mine shafts, cliffs, crevices, abandoned buildings, and under bridges; forages over water	No potential habitat within the project area.
Big free-tailed bat	*Nyctinomops macrotis*	Roost in rock crevices in rocky areas of arroyo, scrub desert, and riparian habitats	Potentially occurring throughout the project area.
Desert bighorn sheep	*Ovis canadensis nelsoni*	Rough, rocky, and brush covered terrain with canyons and washes	Potentially migrates through the project area.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Western pipistrelle	*Pipistrellus hesperus*	Roosts in trees, caves, abandoned buildings, and under bridges; forages over water and desert washes, and in woodlands	Potentially occurring throughout the project area.
Brazilian free-tailed bat	*Tadarida brazilliensis*	Roosts in trees, caves, abandoned buildings, and under bridges; forages over water and desert washes, and in woodlands	Potentially occurring throughout the project area.
		Birds	
Golden eagle	*Aquila chrysaetos*	Open country, especially hilly and mountainous regions	Potentially occurring throughout the project area.
Long-eared owl	*Asio otus*	Riparian areas and other dense stands of trees, edges of coniferous forest	Potentially occurring throughout the project area.
Western burrowing owl	*Athene cunicularia hypugea*	Nests in grasslands and shrublands, often in association with ground squirrels and badgers, which excavate burrows it uses for nesting	Known to occur in the project area.
Juniper titmouse	*Baeolophus griseus*	Occurs in piñon-juniper woodlands	No potential habitat in the project area.
Ferruginous hawk	*Buteo regalis*	Prefers to nest at interface of piñon-juniper zone and desert shrub communities	Potentially occurring throughout the project area. Only two known records in southern Nevada from the Las Vegas and Pahranagat valleys.
Swainson's hawk	*Buteo swainsoni*	Nests in deciduous trees and shrubs in riparian areas or around springs	Common spring and fall migrant in the desert.
Greater sage grouse	*Centrocercus urophasianus*	Sage brush habitat and wet meadows and riparian areas for brood rearing	No potential habitat in the project area.
Prairie falcon	*Falco mexicanus*	Grasslands, savannas, rangeland, agricultural areas, desert scrub; nests on cliffs or bluffs	Potentially occurring throughout the project area. Typically a spring resident.
Peregrine falcon	*Falco peregrinus*	Cliffs or canyons near water for cover and nesting	Potentially occurring wherever suitable nesting cliffs are present. Known to occur near the Panaca Hills northeast of the project area and in the Pahranagat Valley (Gullion et al. 1959).
Sandhill crane	*Grus canadensis*	Winter habitat typically consists of river channels or wetlands for roosting and pastures, marshes, and meadows for foraging	No suitable habitat in the project area.
Piñon jay	*Gymnorhinus cyanocephalus*	Occurs in piñon-juniper woodlands, occasionally visiting pine forests	No potential habitat in the project area.
Yellow-breasted chat	*Icteria virens*	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles and dense brush	No suitable habitat in the project area. Possible spring migrant.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Least bittern	*Ixobrychus exilis*	Dense emergent wetland vegetation, sometimes interspersed with woody vegetation and open water	No suitable habitat in the project area.
Loggerhead shrike	*Lanius ludovicianus*	Open ground including grassland, riparian, open woodland	Potentially occurring throughout the project area.
Black rosy-finch	*Leucosticte atrata*	Barren, rocky, or grassy areas; occasionally in brushy areas and open situations	Not expected to occur in the project area.
Long-billed curlew	*Numenius americanus*	Emergent mudflats	No suitable habitat in the project area.
Flammulated owl	*Otus flammeolus*	Mountain pine forests	No suitable habitat in the project area.
Phainopepla	*Phainopepla nitens*	Desert scrub and mesquite and juniper woodlands	Potentially occurring throughout the project area.
Vesper sparrow	*Pooecetes gramineus*	Dry sagebrush shrublands, savannahs, arid scrub, and woodland clearings	Potentially occurring throughout the project area. Uncommon spring and fall migrant.
Red-naped sapsucker	*Sphyrapicus nuchalis*	Forest and open woodland habitats, typically coniferous forests with aspen and other hardwoods	No suitable habitat in the project area.
Crissal thrasher	*Toxostoma crissale*	Permanent resident of desert successional scrub	Potentially occurring in the project area. Typically associated with mesquite thickets of the Las Vegas, Pahrump and Moapa valleys south of the project area.
LeConte's thrasher	*Toxostoma lecontei*	Prefers open desert scrub, washes, alkali desert scrub, and desert succulent shrub habitats	Potentially occurring in the Tule Desert.
Lucy's warbler	*Vermivora luciae*	Occurs in deserts and in riparian woodlands	Potentially occurring throughout the project area.
Gray vireo	*Vireo vicinor*	Inhabits shrubby, semi-arid habitats in shrubby piñon-juniper woodlands and desert scrub	Potentially occurring throughout the project area. Recorded from the Clover Mountains and Tule Desert.
Reptiles			
Gila monster	*Heloderma supectum*	Shrubby, grassy, and succulent desert	Potentially occurring throughout the project area.
Chuckwalla	*Sauromalus obesus*	Deserts with rocky hillsides and outcrops, creosote typically present	Potentially occurring throughout the project area.
Amphibians			
Arizona toad	*Bufo microscaphus microscaphus*	Found in washes, streams, and arroyos of semiarid habitats	Only known from the upper reaches of Meadow Valley Wash. Not likely to occur.
Northern leopard frog	*Rana pipiens*	Frequents streams or marshes with permanent water and cattails, but may occur in grasslands, brushlands, woodlands, and forests	No suitable habitat in the project area.
Fish			
Meadow Valley Wash desert sucker	*Catostomus clarki* ssp.	Only located in the Meadow Valley Wash	Populations are known from the Meadow Valley Wash, approximately 12 miles east of the project area.
Flannelmouth sucker	*Catostomus latipinnis*	Moderate to large rivers with pools and deep runs.	Known to occur in the Virgin River.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Virgin River chub	*Gila seminude*	Located in areas of slow to moderate flow with deep runs or pools where large boulders or root snags provide instream cover in the Virgin River	Restricted to areas of the Virgin River upstream of the Mesquite Diversion southeast of the project area and the middle and upper reaches of the Muddy River south of the project area.
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	Populations currently exist in the mainstem Virgin River and eleven of its tributaries including East Fork Virgin River, Shunes Creek, North Fork Virgin River, North Creek, La Verkin Creek, Ash Creek, Santa Clara River, Beaver Dam Wash, Coal Pits Wash, Moody Wash and Magotsu Creek (Lentsch 2002)	Only expected to occur in the mainstem of the Virgin River southeast of the project area.
Meadow Valley Wash speckled dace	*Rhinichthys osculus* ssp.	Found in Meadow Valley Wash	Populations are known from the Meadow Valley Wash, approximately 12 miles east of the project area.
Pahranagat speckled dace	*Rhinichthys osculus velifer*	Found in Crystal Springs	Only known in the Pahranagat Valley near Crystal Springs, approximately 45 miles northwest of the project area.
Invertebrates			
White River wood nymph	*Cercyonis pegala pluvialis*	Associated with riparian and wetland habitats.	Known to occur in the White River and possibly the Steptoe and Spring valleys.
Pahranagat naucorid bug	*Pelocoris shoshone shoshone*	Associated with riparian and wetland habitats.	
Moapa Warm Spring riffle beetle	*Stenelmis moapa*	Outlet streams from warm temperature springs in swift, shallow water; found on gravel, vegetation, and bare tree roots.	Only known to occur in the Warm Springs area of the Muddy River.
Grated tryonia	*Tryonia clathrata*	Freshwater spring systems, typically in algae and detritus substrates. Known to occur in the Cardy Lamb and Muddy Spring systems; likely to occur in the Warm Springs area, all in Clark County, Nevada. May also occur in the Pahranagat and White River valleys to the north.	Closest potential occurrence is in the Pahranagat Valley, west of the project area and the Warm Springs area south of the project area.

APPENDIX E-3

STATE OF NEVADA CLASSIFIED WILDLIFE SPECIES THAT MAY OCCUR IN OR NEAR THE PROJECT AREA

Common Name	Scientific Name	Habitat	Potential for Occurrence
		MAMMALS	
Ringtail (SS)	*Bassariscus astutus*	Desert scrub, chaparral, pine-oak, and conifer woodlands in rocky areas with cliffs or crevices.	Potentially occurring throughout the project area, typically within 0.5 miles of water.
Pygmy rabbit (SS)	*Bruchylugus icluhoensis*	Dense stands of big sagebrush growing in deep loose soils.	No suitable habitat in the project area.
Desert pocket mouse (SS)	*Chaetoclipus penicillatus*	Sparsely vegetated sandy desert floors and rock-free bottomland soils near rivers and streams.	No suitable habitat in the project area.
Desert kangaroo rat (SS)	*Dipoclomys cleserti*	Low deserts with sandy soil. Most often associated with deposits of deep wind-blown sand.	Potentially occurring in areas where sand deposits occur.
Spotted bat (SS)	*Euclerma maculatum*	Roosts in caves, crevices, talus, trees, bridges, and buildings; forages over water, and in desert washes, and woodlands	Potentially occurring throughout the project area.
Allen's big-eared bat (SS)	*Iclionyctarus phylottis*	Typically roosts in large, dead snags. Uses riparian areas in southern Nevada.	No suitable habitat in the project area. May occur to the south along the Virgin River.
Western yellow bat (SS)	*Lasiurus xanthinus*	Most often associated with fan palm oases, but may use riparian areas as well.	No suitable habitat in the project area. Closest potential habitat is south of the project area.
Sagebrush vole (SS)	*Lemmiscus curtatus*	Occurs in semi-arid prairies, rolling hills, and brushy canyons, with loose, well-drained soils where sagebrush and bunch grasses are present.	No suitable habitat in the project area.
Desert Valley kangaroo mouse (SS)	*Microclipoclops megacephalus albiventer*	Occurs in loose sands and gravel of shadscale scrub, sagebrush scrub, and alkali sink plant communities	Known to occur near the project area.
Pahranagat Valley montane vole (SS)	*Microtus montanus fucosus*	Low elevation wet valleys	No suitable habitat in the project area.
Small-footed myotis (SS)	*Myotis ciliolabrum*	Desert, badland, semidesert, and desert mountain habitats from 1,000 to 11,000 feet, typically found in desert scrub	Potentially occurring throughout the project area.
Little brown myotis (SS)	*Myotis lucifugus*	Prefers to forage over water. Usually hibernates in caves and mines, often roosts and breeds in Buildings	No suitable habitat in the project area.
Big free-tailed bat (SS)	*Nyctinomops macrotis*	Roost in rock crevices in rocky areas of arroyo, scrub desert, and riparian habitats	Potentially occurring throughout the project area.
Mule deer (SS)	*Odocoileus hemionus*	Occurs in coniferous forests, desert shrub, chaparral, grasslands with shrubs.	No suitable habitat in the project area.
Desert bighorn sheep (SS)	*Ovis cunudensis nelsoni*	Rough, rocky, and brush covered terrain with canyons and washes	Potentially migrates through the project area.
Merriam's shrew (SS)	*Sorex merriumileucogenys*	Occurs in grassy areas in sagebrush scrub and pinon juniper habitats.	No suitable habitat in the project area.
Water shrew (SS)	*Sorex palustris*	Most abundant along cold mountain streams, usually found in areas with water.	Unlikely to occur in the project area due to a lack of surface water.
Kit fox (SS)	*Vulpes macrotis*	Occurs in open desert, shrubby, or shrub-grass habitat and in the Mojave Desert it typically is associated with creosote bush.	Potentially occurring in the project area.

Common Name	Scientific Name	Habitat	Potential for Occurrence
BIRDS			
White-throated swift (SS)	*Aeronautes saxatalis*	Occurs in mountainous country where cliffs and canyons are present for breeding.	Potentially occurring throughout the project area where suitable habitat exists.
Sage sparrow (SS)	*Amphispiza belli*	Prefers semi-open habitats where sagebrush is present for breeding. Also occurs in salt-bush brushland, shadscale, antelope brush, rabbitbrush, mesquite, and chaparral.	Potentially occurring as a winter resident.
Short-eared owl (SS)	*Asio flammeus*	Winters in southern Nevada in open areas with abundant prey base.	Potentially occurring as a winter resident in the project area.
Western burrowing owl (SS)	*Athene cuniculuriu hypugea*	Nests in grasslands and shrublands, often in association with ground squirrels and badgers, which excavate burrows it uses for nesting	Potentially occurring throughout the project area.
Verdin (SS)	*Auriparus flaviceps*	Desert and arid brush of creosote bush.	Potentially occurring in the project area.
Ferruginous hawk (SS)	*Buteo regalis*	Prefers to nest at interface of pinon juniper zone and desert shrub communities	Potentially occurring in the project area. Only two known records in southern Nevada from the Las Vegas and Pahranagat valleys.
Costa's hummingbird (SS)	*Calypte costae*	Occurs in Desert and semi-desert arid brushy foothills and chaparral. Typically nests in canyons and washes.	Potentially occurring throughout the project area.
Cassin's finch (SS)	*Carpodacus cassinii*	Breeds in open coniferous forests; winters in deciduous woodlands, scrub, brushy areas, and partly open situations with scattered trees	Possible winter resident in the project area.
Peregrine falcon (SS)	*Falco peregrinus*	Cliffs or canyons near water for cover and nesting	No suitable nesting cliffs are present. Known to occur near the Panaca Hills and in the Pahranagat Valley (Gullion et al. 1959).
Scott's oriole (SS)	*Icterus purisorum*	Occurs in Mojave mid-elevation desert scrub and lower montane woodland.	Potentially occurring throughout the project area.
Loggerhead shrike (SS)	*Lunius luclovicíunus*	Open ground including grassland, riparian, open woodland	Potentially occurring throughout the project area.
Phainopepla (SS)	*Phuinopeplu nitens*	Desert scrub and mesquite and juniper woodlands	Potentially occurring throughout the project area.
Abert's towhee (SS)	*Pipilo uberti*	Usually associated with rivers and streams in woodlands and thickets of mesquite, willow, and cottonwood. Also occurs in desert scrub habitat.	Potentially occurring in the project area.
Black Phoebe (SS)	*Suyomis nigricuns*	Usually found near water of marshy ponds, open woodlands along streams, and near farm ponds and irrigation ditches.	Potentially occurring throughout the project area where water is present.
Rufous hummingbird (SS)	*Selusphorus rufus*	Migrant throughout Nevada.	Potentially occurring as a migrant in meadows where nectar plants are present.
Black-chinned sparrow (SS)	*Spizellu utroguluris*	Breeds in chaparral, sagebrush, and arid scrub on gentle hillsides to steep, rocky slopes, or in brushy canyons.	Potentially occurring throughout the project area.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Brewer's sparrow (SS)	*Spizellu breweri*	Breeds in sagebrush and desert scrub habitats.	Potentially occurring in the project area.
Bendire's thrasher (SS)	*Toxostomu benclirei*	Occurs in sagebrush and scattered junipers at higher elevations and at lower elevations, occurs in desert grassland and shrubland with spiny shrubs or cacti, such as cholla, Joshua tree, mesquite, catclaw, desert-thorn or agave.	Potentially occurring throughout the project area.
Crissal thrasher (SS)	*Toxostomu crissule*	Permanent resident of desert successional scrub	Potentially occurring in the project area. Typically associated with mesquite thickets of the Las Vegas, Pahrump and Moapa valleys south of the project area.
LeConte's thrasher (SS)	*Toxostoma lecontei*	Prefers open desert scrub, washes, alkali desert scrub, and desert succulent shrub habitats	Potentially occurring in the project area.
Lucy's warbler (SS)	*Vermivora luciae*	Occurs in deserts and in riparian woodlands	Potentially occurring in the project area.
Arizona Bell's vireo (SS)	*Vireo bellii arizonae*	Occurs near water typically in areas with dense, low, shrubby vegetation, generally early successional stages in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, and mesquite brushlands.	Potentially occurring throughout the project area where suitable habitat occurs.
Gray vireo (SS)	*Vireo vicinor*	Inhabits shrubby, semi-arid habitats in shrubby pifion juniper woodlands and desert scrub	Potentially occurring throughout the project area.
		REPTILES	
Western banded gecko (SS)	*Coleonyx vuriegutus*	Occurs in rocky areas of creosote bush and sagebrush desert.	Potentially occurring in the project area.
Great Basin collared lizard (SS)	*Crotaphytus bicinctores*	Occurs in xeric, sparsely vegetated rocky areas.	Potentially occurring in the project area.
Desert iguana (SS)	*Dipsosaurus clorsalis*	Typically occupies areas of creosote bush desert with loose sand and patches of firm ground with scattred rocks.	Potentially occurring in the project area.
Long-nosed leopard lizard(SS)	*Gumbeliu wislizenii*	Occupies desert and semidesert areas with scattered shrubs and other low plants, especially areas with abundant rodent burrows.	Potentially occurring in the project area.
Desert tortoise (SS)	*Gopherus agassizii*	Occurs in desert habitats with firm ground and herbaceous plant cover.	Known to occur in the project area.
Gila monster (SS)	*Heloclernua supectum*	Shrubby, grassy, and succulent desert	Potentially occurring in the project area.
Desert horned lizard (SS)	*Phrynosomu phutyrhinos*	Found in arid regions in sandy flats, alluvial fans, washes, and at the edge of dunes in sagebrush habitat as well as creosotebush, greasewood, and cactus deserts.	Potentially occurring in the project area.
Chuckwalla (SS)	*Sauromalus obesus*	Deserts with rocky hillsides and outcrops, creosote typically present	Potentially occurring in the project area.

Common Name	Scientific Name	Habitat	Potential for Occurrence
Sonoran lyre snake (SS)	*Trimorphodon biscutatus lambda*	Inhabits rocky areas of lowlands, mesas, and lower mountain slopes where desert grassland, desert scrub, chaparral, pinon juniper and oak woodland, and open coniferous forest vegetation types occur.	Potentially occurring throughout the project area.
Long-tailed brush lizard (SS)	*Urosuurus gruciosus*	Occurs in areas of loose sand where creosote bush, other bushes, and trees are present.	Potentially occurring throughout the project area.
Desert night lizard (SS)	*Xantusia vigilis vigilis*	Typically in arid and semiarid granite outcroppings and rocky areas, but occasionally will travel into pinonjuniper woodlands.	Potentially occurring throughout the project area.
AMPHIBIANS			
Relict leopard frog (SP)	*Rana once*	Occur in spring, spring outflow, and associated marsh and wetland habitats.	No potential habitat in the project area, only known to occur in Lake Mead today. Historic distribution included the Virgin and Muddy rivers.
FISH			
Pahranagat roundtail chub (SE)	*Gila robusta jordani*	Protected pools in the Pahranagat Valley.	Restricted to the Pahranagat Valley.
Virgin River chub (SE)	*Gila seminude*	Located in areas of slow to moderate flow with deep runs or pools where large boulders or root snags provide instream cover in the Virgin River	Restricted to areas of the Virgin River upstream of the Mesquite Diversion south of the project area and the middle and upper reaches of the Muddy River south of the project area.
Virgin River spinedace (SP)	*Lepidomedu mollispinis mollispinis*	Populations currently exist in the mainstem Virgin River and eleven of its tributaries including East Fork Virgin River, Shunes Creek, North Fork Virgin River, North Creek, La Verkin Creek, Ash Creek, Santa Clara River, Beaver Dam Wash, Coal Pits Wash, Moody Wash and Magotsu Creek (Lentsch 2002)	Only expected to occur in the mainstem of the Virgin River south of the project area.
Moapa dace (SE)	*Moupu coriuceu*	Known to occur in springs, pools, spring feeders, small outflow streams, and the Muddy River of the Warm Springs Area where turbidity is low.	Known to occur in pools and streams in the Warm Springs area as well as the mainstem of the Muddy River.
Woundfin (SE)	*Plagopterus urgentissimus*	Occupies runs and quiet waters adjacent to riffles.	Known to occur in the mainstem of the Virgin River from La Verkin Springs in Utah downstream to Lake Mead and in the lower portions of La Verkin Creek in Utah.
Moapa speckled dace (SS)	*Rhinichthys osculus moapae*		

APPENDIX E-4

COMMON WILDLIFE SPECIES THAT ARE EXPECTED TO OCCUR WITHIN OR NEAR THE PROJECT AREA

Common Name	Scientific Name
Mammals	
American badger	*Taxidea taxus*
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Gray fox	*Urocyon cinereoargentus*
Kit fox	*Vulpes macrotis*
Mountain lion	*Puma concolor*
Mule deer	*Odocoileus hemionus*
Nelson (Desert) bighorn sheep	*Ovis canadensis nelsoni*
Black-tailed jackrabbit	*Lepus californicus*
Crecetid mice	*Onychomys, Reithrodontomys megalotis, Peromyscus*
Desert cottontail	*Sylvilagus audobonii*
Desert wood rat	*Neotoma lepida*
Merriam's kangaroo rat	*Dipodomys merriamii*
Pocket gopher	*Thomomys bottae*
Pocket mice	*Perognathus, Chaetodipus*
Rock squirrel	*Spermophilus variegatus*
Round-tailed ground squirrel	*Spermophilus tereticaudus*
White-tailed antelope squirrel	*Ammospermophilus leucurus*
Ringtail	*Bassariscus astutus*
Spotted skunk	*Spilogale gracilus*
Big brown bat	*Eptesicus fuscus*
California myotis	*Myotis californicus*
Fringed myotis bat	*Myotis thysanodes*
Leafnose bat	*Macrotus californicus*
Little brown myotis bat	*Myotis lucifugus*
Long-eared myotis bat	*Myotis evotis*
Long-legged myotis bat	*Myotis volans*
Pallid bat	*Antrozous pallidus*
Small-footed myotis bat	*Myotis subulatus*
Western pipistrelle bat	*Pipistrellus hesperus*
Yuma myotis bat	*Myotis yumanensis*
Herpetiles	
Bullfrog	*Rana catesbaiana*
Great basin spadefoot	*Spea intennontana*
Great Plains toad	*Bufo cognatus*
Red-spotted toad	*Bufo punctatus*
Western toad	*Bufo boreas*
Woodhouse's toad	*Bufo woodhousei*
Chuckwalla	*Sauromalus (obesus) ater*
Coachwhip	*Masticophis flagellum*
Common kingsnake	*Lampropeltis getula*

Common Name	Scientific Name
Desert horned lizard	*Phrynosoma platyrhinos*
Desert iguana	*Dipsosaurus dorsalis*
Desert spiny lizard	*Sceloporus magister*
Gila monster	*Helodenna suspectum*
Glossy snake	*Arizona elegans*
Gopher snake	*Pituophis catenifer*
Great Basin collared lizard	*Crotaphytus bicinctores*
Ground snake	*Sonora semiannulata*
Long-nosed leopard lizard	*Gambelia wislizenii*
Long-nosed snake	*Rhinocheilus lecontei*
Lyre snake	*Trimorphodon biscutatus*
Mojave rattlesnake	*Crotalus scutulatus*
Night snake	*Hypsiglena torquata*
Patch-nosed snake	*Salvadora hexalepis*
Side-blotched lizard	*Uta stansburiana*
Sidewinder (Horned rattlesnake)	*Crotalus cerastes*
Southwestern black-headed snake	*Tantilla hobartsmithi*
Speckled rattlesnake	*Crotalus mitchellii*
Spotted leaf-nose snake	*Phyllorhynchus decurtatus*
Western banded gecko	*Coleonyx variegatus*
Western blind snake	*Leptotyphlops humilis*
Western whiptail	*Cnemidophorus Aspidosceles tigris*
Zebra-tailed lizard	*Callisaurus draconoides*
Birds	
American kestrel	*Falco sparverius*
Barn owl	*Tyto alba*
Burrowing owl	*Athene cunicularia*
Golden eagle	*Aquila chrysaetos*
Great-horned owl	*Bubo virginianus*
Prairie falcon	*Falco rnexicanus*
Red-tailed hawk	*Buteo jamaicensis*
Ash-throated flycatcher	*Myiarchus cinerascens*
Black-chinned hummingbird	*Archilochus alexandri*
Black-chinned sparrow	*Amphispiza bilineata*
Black-tailed gnatcatcher	*Polioptila melanura*
Cactus wren	*Campylorhynchus brunneicapillus*
Canyon wren	*Catherpes mexicanus*
Common poorwill	*Phalaenoptilus nuttallii*
Common raven	*Corvus corax*
Gambel's quail	*Callipepla gambelii*
Greater roadrunner	*Geococcyx californianus*
Horned lark	*Eremophila alpestris*

Common Name	Scientific Name
Ladder-backed woodpecker	*Picoides scalaris*
Lesser nighthawk	*Chordeiles acutipennis*
Loggerhead shrike	*Lanius ludovicianus*
Mourning dove	*Zenaida macroura*
Phainopepla	*Phainopepla nitens*
Rock wren	*Salpinctes obsoletus*
Say's phoebe	*Sayornis saya*
Scott's oriole	*Icterus parisorum*
Verdin	*Auriparus faviceps*
Western kingbird	*Tyrannus verticalis*
White-throated swift	*Aeronautes saxatalis*

APPENDIX E-5

RISK ASSESSMENT FOR NOXIOUS AND INVASIVE WEEDS

RISK ASSESSMENT FOR NOXIOUS & INVASIVE WEEDS

Kane Springs Valley Groundwater Development Project
Lincoln County, Nevada

On December 5th, 2007 a Noxious & Invasive Weed Risk Assessment was completed for the Kane Springs Valley Groundwater Development project in Lincoln County, Nevada. The Lincoln County Water District is seeking a ROW from the BLM for the purpose of developing and conveying groundwater withdrawal from the carbonate aquifer in Kane Springs Valley for use by the northern portion of the Coyote Spring Valley. The project facilities would be located within or immediately adjacent to the 2,640-foot wide utility corridor established by the Lincoln County Conservation, Recreation, and Development Act (LCCRDA) of 2004 (Public Law 108-424). Construction activities would occur in three phases, with 1 to 3 years between phases and includes well pads, storage facilities, piplines, and water tanks. The there is an estimated 191 acres of temporary and 23 acres of permanent disturbance associated with this project.

No field weed surveys were completed for this project. Instead the Ely District weed inventory data was consulted (Weedpoints_20071114.shp). Currently, there are no known infestations at the project site, however the following weed species are found in the vicinity:

Acroptilon repens	Russian knapweed
Brassica tournefortii	Sahara mustard
Lepidium draba	Hoary cress
Lepidium latifolium	Tall whitetop
Tamarix spp.	Salt cedar

There is also red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), and Russian thistle (*Salsola kali*) scattered along roads in the area.

Factor 1 assesses the likelihood of noxious/invasive weed species spreading to the project area.

None (0)	Noxious/invasive weed species are not located within or adjacent to the project area. Project activity is not likely to result in the establishment of noxious/invasive weed species in the project area.
Low (1-3)	Noxious/invasive weed species are present in the areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of noxious/invasive weeds into the project area.
Moderate (4-7)	Noxious/invasive weed species located immediately adjacent to or within the project area. Project activities are likely to result in some areas becoming infested with noxious/invasive weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of noxious/invasive weeds within the project area.
High (8-10)	Heavy infestations of noxious/invasive weeds are located within or immediately adjacent to the project area. Project activities, even with preventative management actions, are likely to result in the establishment and spread of noxious/invasive weeds on disturbed sites throughout much of the project area.

For this project, the factor rates as Moderate (7) at the present time. While there are no known infestations within the project area, the amount of ground disturbance associated with this project, the heavy machinery to be used, and the amount and species of weeds in the nearby area will result in some of the project becoming infested with new weed infestations.

Factor 2 assesses the consequences of noxious/invasive weed establishment in the project area.

Low to Nonexistent (1-3)	None. No cumulative effects expected.
Moderate (4-7)	Possible adverse effects on site and possible expansion of infestation within the project area. Cumulative effects on native plant communities are likely but limited.
High (8-10)	Obvious adverse effects within the project area and probable expansion of noxious/invasive weed infestations to areas outside the project area. Adverse cumulative effects on native plant communities are probable.

This project rates as Moderate (7) at the present time. The project area is currently considered to be weed free so any new infestations might have cumulative effects on the nearby native plant community. These effects would be limited for noxious weeds given the limited rainfall and soil types in the area. However, any increase of the invasive weeds red brome or cheatgrass could alter the fire regime in the area.

The Risk Rating is obtained by multiplying Factor 1 by Factor 2.

None (0)	Proceed as planned.
Low (1-10)	Proceed as planned. Initiate control treatment on noxious/invasive weed populations that get established in the area.
Moderate (11-49)	Develop preventative management measures for the proposed project to reduce the risk of introduction of spread of noxious/invasive weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor the area for at least 3 consecutive years and provide for control of newly established populations of noxious/invasive weeds and follow-up treatment for previously treated infestations.
High (50-100)	Project must be modified to reduce risk level through preventative management measures, including seeding with desirable species to occupy disturbed site and controlling existing infestations of noxious/invasive weeds prior to project activity. Project must provide at least 5 consecutive years of monitoring. Projects must also provide for control of newly established populations of noxious/invasive weeds and follow-up treatment for previously treated infestations.

For this project, the Risk Rating is Moderate (49). This indicates that the project can proceed as planned as long as the following measures are followed:

- Monitoring will be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports will be provided to the BLM. If the spread of noxious weeds is noted, appropriated weed control procedures will be determined in consultation with BLM personnel and will be in compliance with the appropriate BLM handbook sections and applicable laws and regulations. All weed control efforts on BLM-administered lands will be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year follow chemical application.
- Prior to the entry of vehicles and equipment to a project area, areas of concern will be identified and flagged in the field by a weed scientist or qualified biologist. The flagging will alert personnel or participants to avoid areas of concern. These sites will be recorded using global positioning systems or other Ely Field Office approved

equipment and provided to the Field Office Weed Coordinator or designated contact person.

- Prior to entering public lands, the contractor, operator, or permit holder will provide information and training regarding noxious weed management and identification to all personnel who will be affiliated with the implementation and maintenance phases of the project. The importance of preventing the spread of weeds to uninfested areas and importance of controlling existing populations of weeds will be explained.
- To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; for emergency fire suppression; or for authorized off-road driving will be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment will be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Cleaning efforts will concentrate on tracks, feet and tires, and on the undercarriage. Special emphasis will be applied to axels, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles. Cleaning sites will be recorded using global positioning systems or other mutually acceptable equipment and provided to the Field Office Weed Coordinator or designated contact person.
- To eliminate the introduction of noxious weed seeds, roots, or rhizomes all interim and final seed mixes, hay, straw, hay/straw, or other organic products used for reclamation or stabilization activities, feed, bedding will be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office.
- To eliminate the introduction of noxious weed seeds, roots, or rhizomes all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation will be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office. Inspections will be conducted by a weed scientist of qualified biologist.
- Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.)
- Reclamation would normally be accomplished with native seeds only. These would be representative of the indigenous species present in the adjacent habitat. Rationale for potential seeding with selected nonnative species would be documented. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. Where large acreages are burned by fires and seeding is required for erosion control, all native species could be cost prohibitive and/or unavailable. In all cases, seed mixes would be approves by the BLM Authorized Officer prior to planting.
- Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).
- Methods used to accomplish weed and insect control objectives would consider seasonal distribution of large wildlife species.

- No noxious weeds will be allowed on the site at the time of reclamation release. Any noxious weeds that become established will be controlled.

Reviewed by: ______________________________ 12/5/2007

Bonnie Waggoner — Date

Ely District Noxious & Invasive Weeds Coordinator

APPENDIX F

COMMENTS ON THE KANE SPRINGS VALLEY GROUNDWATER DEVELOPMENT PROJECT DRAFT EIS
AND
BLM'S RESPONSES TO COMMENTS

APPENDIX F - RESPONSES TO COMMENTS

The 60-day comment period for public review of the Draft EIS began with the publication of the Notice of Availability in the Federal Register on June 22, 2007. The BLM distributed press releases announcing the dates, locations, and times of the public meetings to local and regional print and broadcast media. The Draft EIS was distributed to individuals and agencies who requested copies (see Chapter 5.3), and posted on the BLM's website at www.blm.gov/nv. Four public meetings were held during the public comment period (June 22 to August 20, 2007) to receive comments on the Draft EIS. Dates and locations of these meetings, and the number of attendees, are as follows:

Carson City, Nevada - 0 Attendees

Date:	July 30, 2007
Time:	4:00 – 6:00 p.m.
Location:	Plaza Hotel

Pioche, Nevada – 1 Attendee

Date:	July 31, 2007
Time:	6:00 – 8:00 p.m.
Location:	Pioche Town Hall

Alamo, Nevada – 3 Attendees

Date:	August 1, 2007
Time:	6:00 – 8:00 p.m.
Location:	Alamo Ambulance Barn

Las Vegas, Nevada – 10 Attendees

Date:	August 2, 2007
Time:	6:00 – 8:00 p.m.
Location:	Atrium Suite Hotel

During the 60-day public comment period, the BLM received 19 comment documents (i.e. letters, emails, faxes) from individuals, private companies, and federal and state agencies commenting on the Draft EIS. A list of comment documents received, the content of each letter, and BLM's responses to comments are provided in Appendix F. Each comment document was assigned a reference number, and each comment within the document was identified with a number. BLM's responses are listed next to the comment. The following is a list of comment documents received:

1. U.S Environmental Protection Agency
2. Nevada Department of Wildlife
3. Nevada State Historic Preservation Office
4. Josh DeGayner
5. Delaine and Rick Spilsbury
6. Center for Biological Diversity
7. Southern Nevada Water Authority
8. Simeon Herskovits – Advocates for Community and Environment
9. Launce Rake – Progressive Leadership Alliance of Nevada
10. Rose Strickland – Toiyabe Chapter of the Sierra Club
11. Jim and Mary Dale Deacon
12. Peter Hahn
13. Bruce Halloway
14. Abigail Johnson
15. B. Sachau
16. Carl Savely
17. Tim Vogt
18. Peter Williamson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

REC'D - BLM - NSO
9:00 A.M. AUG 27 2007

August 20, 2007

Penny Woods, Project Manager
Bureau of Land Management
Nevada State Office
Groundwater Projects Office
1340 Financial Blvd.
P.O. Box 12000
Reno, NV 89520

Subject: Draft Environmental Impact Statement for Kane Springs Valley Groundwater Development Project, Lincoln County, Nevada (CEQ# 20070255)

Dear Ms. Woods,

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the above project. Our review and comments are pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

Based on our review, we have rated the Kane Springs Valley Groundwater Development Project as Environmental Concerns – Insufficient Information (EC-2). A *Summary of EPA Rating Definitions* is enclosed. EPA is concerned with the cumulative impacts of the proposed project in conjunction with reasonably foreseeable future residential, commercial, groundwater, and energy development projects in the region; all of which anticipate use of the same carbonate-rock aquifer. Our concern is based upon the many pending water right applications and uncertainties regarding the long-term sustainable yield of this aquifer.

We urge the Bureau of Land Management, Cooperating Agencies, Lincoln County Water District, Vidler Water Company, Coyote Springs Investments, and other water right applicants to develop a regional groundwater framework to ensure efficient long-term sustainable use of the deep carbonate-rock aquifer and avoidance of adverse impacts to third parties and surface and groundwater quality and quantity.

The proposed project is located in the Mojave Desert characterized by low humidity and minimal annual rainfall. Water supply sources are scarce. We recommend that Kane Springs Valley project water be utilized only after a clear demonstration by beneficiaries of effective use of in-basin supplies and application of aggressive water use efficiency, conservation, and reuse measures. We also recommend that the final environmental impact statement (FEIS) include a discussion of potential monitoring, adaptive management and mitigation measures for the direct impacts of the project to regional springs, as well as indirect and cumulative impacts.

We appreciate the opportunity to review this DEIS. We are available to discuss our comments. When the FEIS is released for public review, please send one copy to the above address (mail code: CED-2). If you have any questions, please call me at 415-972-3846 or Laura Fujii, of my staff, at 415-972-3852 or fujii.laura@epa.gov.

Sincerely,

Nova Blazej, Manager
Environmental Review Office

Enclosures:
Summary of EPA Rating Definitions
Detailed Comments

Cc: Jeff Weeks, BLM, Ely District Office
Annalaura Averill-Murry, U.S. Fish and Wildlife Service, Nevada Field Office
Brad Hardenbrook, Nevada Department of Wildlife
Brad Huza, Moapa Valley Water District
Ronda Hornbeck, Lincoln County Water District
Donald A. Pattalock, Vidler Water Company
Ruth Sundermeyer, Coyote Springs Investments

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE KANE SPRINGS VALLEY GROUNDWATER DEVELOPMENT PROJECT, LINCOLN COUNTY, NV, AUGUST 20, 2007.

Cumulative Impact Analysis

Promote formation of a regional carbonate-rock groundwater framework and aggressive water use efficiency and conservation. EPA is concerned with the potential adverse cumulative impacts of the proposed project in conjunction with reasonably foreseeable future projects which anticipate use of the same carbonate-rock aquifer. Our concern is based upon: 1) the many pending water right applications in Nevada and Utah; 2) the uncertainties regarding: the amount of ground-water recharge, quantification of subsurface inflows and outflows, the connection of Kane Springs Valley with the White River Regional flow system, the interconnection between multiple hydrographic basins; and, 3) impacts on senior appropriated water rights and sensitive aquatic resources in down-gradient basins (Nevada State Engineer Ruling 5712, p. 15). Table 4-7 (p. 4-59) also indicates that permitted water rights may already exceed the estimated perennial yield for the cumulative impacts area (Kane Springs Valley, Coyote Spring Valley, Muddy River Springs Valley). The draft environmental impact statement (DEIS) also states that there may be potential direct impacts to groundwater quantity from drawdown and indirect impacts related to lowered yields at regional springs (p. ES-13).

Recommendations:

Comment No. 1-1

EPA commends the collaboration between the water right applicants and U.S. Fish and Wildlife to address potential impacts to Muddy River Springs sensitive species (Appendix A) from use of the carbonate-rock aquifer. We recommend the Bureau of Land Management (BLM), Cooperating Agencies, Lincoln County Water District (LCWD), Vidler Water Company (VWC), Coyote Springs Investments (CSI), and other water right applicants continue this collaboration in the form of a regional groundwater framework to ensure efficient long-term sustainable use of the deep carbonate-rock aquifer and avoidance of adverse impacts to third parties and surface and groundwater quality and quantity. Opportunities for such collaboration should be discussed in the final environmental impact statement (FEIS).

Comment No. 1-2

We also recommend that water provided by this project be allocated only after the beneficiaries have demonstrated effective use of in-basin supplies and maximum water use efficiencies, such as conservation, reuse, and maintenance of water quality. This information should also be included in the FEIS, as discussed below.

Implement measures to avoid and minimize adverse indirect and cumulative impacts to regional springs. While we recognize and commend the agreements to minimize adverse impacts on the Moapa dace and Muddy River Springs (Appendix A), we remain concerned with potential indirect and cumulative impacts to other third parties, beneficial uses, and aquatic species, wildlife, and habitat resources due to cumulative reduction in flows to regional springs.

Response to Comment No. 1-1

The BLM not only has the authority, but also the responsibility to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. As required under the Federal Land Policy and Management Act of 1976, the BLM will continue to coordinate with other public and local entities when making resource decisions regarding the Proposed Action. Table 1-2 (Authorizations, Permits, Review, and Approvals) provides a listing of agencies and their responsibilities relating to the Proposed Action. Although the BLM has the authority and responsibility to coordinate with agencies and water rights applicants, it is the responsibility of the State Engineers Office to award or deny water rights applications and thus ensure efficient long-term sustainable use of the deep carbonate aquifer. One such collaboration is presented in the Stipulation Agreement between LCWD/Vidler Water Company and the U.S. Fish and Wildlife Service (Appendix A-1) which represents a separate process not required under FLPMA or any other law.

Response to Comment No. 1-2

As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The BLM has the authority to approve or deny the right of way application (for which this EIS was written) for use of federal lands.

Comment No. 1-3

Recommendations:
The final environmental impact statement (FEIS) should describe potential indirect and cumulative impacts to regional springs other than Muddy River Springs, and on other third parties, beneficial uses, and sensitive resources. We recommend the FEIS include a description of measures which could avoid or minimize these impacts, and the most appropriate entities to implement these measures.

Comment No. 1-4

Water rights and appropriations from the carbonate-rock aquifer are regulated by the Nevada State Engineer. To ensure full disclosure, we recommend the FEIS describe the water right permitting process and the role of the Nevada State Engineer in protecting beneficial uses, human health, and the environment. For example, describe whether water right permits include special conditions; measures to mitigate direct, indirect, and cumulative impacts; and provisions for monitoring and adaptive management.

Comment No. 1-5

We recommend the FEIS include a discussion of potential monitoring, adaptive management and mitigation measures for the direct impacts of the project, as well as indirect and cumulative impacts. The description of potential mitigation measures should discuss the effectiveness of the measure and the appropriate entities to implement the mitigation.

Provide a summary of the CSI development and the potential direct, indirect and cumulative impacts of this connected action. The CSI development would be the primary beneficiary of the proposed Kane Springs Valley Groundwater Development Project (Appendix B Nevada State Engineer's Ruling 5712, p. 19). In addition, the CSI development would require an additional 70,000 acre-feet per year (afy) for build-out (15,000 afy for CSI-Clark County, p. 4-49; and 55,000 afy CSI–Lincoln County, p. 4-54). Actions are connected if they are closely related and if they cannot or will not proceed unless other actions are taken previously or simultaneously (40 CFR 1508.25(a)(1)). The CSI development is a connected action, in that the development relies, upon the water provided by the Kane Springs Valley Groundwater Development Project, existing Coyote Springs Valley permitted water rights, and pending water right applications. We are concerned with the potential direct, indirect and cumulative impacts associated with the CSI development which would result in conversion of approximately 36,603 acres of Mojave Desert (pps. 4-48, 4-51) to urban use.

Comment No. 1-6

Recommendation:
The FEIS should include a summary of the potential direct, indirect, and cumulative impacts from the CSI development enabled by this project. Of specific interest are potential impacts to water resources, air quality, desert biotic communities, wildlife, Wilderness, Special Use Areas, and Areas of Critical Environmental Concern. The FEIS should also discuss the status of the EIS for the CSI Development/Multi-Species Habitat Conservation Plan.

Response to Comment No. 1-3

Chapter 4 (Environmental Consequences) describes potential indirect impacts to regional springs and other sensitive resources within the project region of influence. Chapter 4.20 (Cumulative Impacts) describes potential cumulative impacts to regional springs and other sensitive resources within the cumulative impact region of influence. Applicant proposed Environmental Protection Measures are listed in Appendix C. Additional mitigation measures may be required by the USFWS through Section 7 or Section 10 consultation. The Biological Opinion is expected to be released by February, 2008 and may contain additional mitigation measures. These will be described in the Record the Decision.

Response to Comment No. 1-4

The water rights and permit appropriation process for the Proposed Action is described in Chapter 1.4.2.1 (Water Rights). Additional information about the Nevada State Engineers permitting process can be found on their website (http://water.nv.gov/). A copy of the Nevada State Engineers ruling for this project is included as Appendix B in the FEIS. A summary of Ruling 5712 has been added to section 3.3.3.3.1 in the FEIS.

Response to Comment No. 1-5

Applicant proposed environmental protection measures to reduce or minimize construction-related impacts are incorporated in the project design and outlined in Appendix C (Standard Construction and Operating Procedures). Potential impacts associated with implementation of mitigation measures that could be required by BLM for issuance of the ROW for the Proposed Action, or another permitting agency, are described in Chapter 4 of the Final EIS for each resource. The BLM would monitor the effectiveness of approved mitigation measures (i.e. desert tortoise fencing, installation of perch inhibitors, revegetation). In addition, the Applicant must comply with specific stipulations directed by the Nevada State Engineer for allocation of water supplies (See Ruling 5712 in Appendix B), and by the USFWS for groundwater pumping and potential impacts to the Muddy River Springs area (See Appendix A).

Conservation and Water Use Efficiency

Provide specific information on CSI development water use and water rights. The DEIS states that LCWD, through its partner VWC, has an agreement with CSI to provide all Kane Springs Basin water to the CSI development in Clark and Lincoln Counties. CSI has also agreed to pay for the proposed groundwater development infrastructure (Appendix B Nevada State Engineer's Ruling 5712, p. 19). The proposed project and CSI development are located in the Mojave Desert where long-term sustainable water use will be crucial in protecting human health and the environment. It is therefore important that decision makers and the public know the source of the water supply and are confident that these supplies will be used in the most appropriate and effective manner.

Comment No. 1-7

Recommendations:
The FEIS should describe how CSI will maximize efficient use of this inter-basin water transfer. For example, the FEIS should provide specific information on proposed CSI development water use efficiency, reuse, and conservation measures. Describe the anticipated level of water use of CSI development households (e.g., amount of gallons per capita per day), water reuse, and water conservation measures in comparison with other southern Nevada developments. We recommend CSI pursue aggressive water use efficiency and conservation measures to ensure the most effective and appropriate use of scarce water supplies.

Comment No. 1-8

The FEIS should also provide specific information on existing CSI certified or permitted water rights in Clark and Lincoln Counties. We recommend the FEIS include information such as the source of the proposed water supply, the long-term sustainability of this source, amount of water permitted for appropriation, and the allowed points of diversion.

Describe water use efficiency, conservation, and reuse management measures applicable to all water supply users. There are many existing and pending water right applications for the carbonate-rock aquifer (e.g., Table 4-7, p. 4-59). EPA strongly supports the implementation of water management tools to maximize water conservation and water use efficiencies – key components of supply and demand management. Innovative and aggressive supply and demand management is essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health. Efforts to improve water supply system flexibility, conservation, and water use efficiencies are even more urgent given the projected growth in Clark and Lincoln Counties, the adverse effects of the current multi-year drought, and the potential adverse effects of climate change on scarce water supplies.

Comment No. 1-9

Recommendations:
We recommend the FEIS include a detailed tool kit of supply and demand management measures in an appendix. The list of tools could serve as a resource for CSI, as well as other users of the carbonate-rock aquifer, the Nevada State Engineer, and water right applicants who wish to maximize the effective use of scarce water supplies. The appendix should describe

Response to Comment No. 1-6

The CSI development is a separate action from the Kane Springs Groundwater Development Project and would occur in the absence of the Proposed Action. Currently, 35,096 AFY of groundwater has been permitted within the Coyote Springs Basin for a variety of uses. Groundwater from Kane Springs Valley will be used to supplement these uses which include municipal, agricultural and industrial applications. In the interest of understanding reasonable foreseeable future actions in the region of influence, the Final EIS contains an expanded discussion of CSI proposed actions in Clark and Lincoln County (Chapter 4.20.3.3.2). See also – Coyote Springs Investment Planned Development Project Draft EIS issued October 5, 2007.

Response to Comment No. 1-7

The CSI development is a separate action from the Kane Springs Groundwater Development Project and would occur in the absence of the Proposed Action. An expanded discussion of CSI proposed actions has been added to Chapter 4.20.3.3.2. It is the responsibility of the Nevada Division of Water Resources to administer and enforce Nevada water law, including appropriation of groundwater and surface water in the state of Nevada. The allocation of water supplies to the LCWD and CSI is under the jurisdiction of the Nevada State Engineer. The distribution, use, and potential reuse and conservation of water in the CSI development would be governed by a General Improvement District, or other regulatory agency tasked with overseeing these resources.

Response to Comment No. 1-8

The CSI development is a separate action from the Kane Springs Groundwater Development Project. The CSI development would occur in the absence of the Proposed Action. An expanded discussion of CSI proposed actions has been added to Chapter 4.20.3.3.2. Information on the source of the proposed water supply, amount of water permitted, and the points of diversion for the CSI project can be found in the Coyote Springs Investment Planned Development Project Draft EIS issued October 5, 2007.

Comment No. 1-9 (Continued)

the full range of tools available to water users to improve water quality and reuse, maximize water use efficiencies, balance supply and demand, and avoid and minimize adverse effects to third parties.

Efficient water use can be enhanced through development, infrastructure, and drinking water policies. We recommend the FEIS discuss the linkages between water use and these factors and describe potential mechanisms to support water use efficiencies. We recommend the FEIS provide a short discussion of who could best implement the identified mechanisms. The following reports may be of assistance as a starting point for the evaluation:

- *Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies*. EPA Publication 230-R-06-001, EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bps-lmit.com.
- *Protecting Water Resources with Higher-Density Development*. EPA publication 231-R-06-001. EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bps-lmit.com.

Long-Term Availability of Water Supplies

Provide a discussion of the relationship between water supply and power availability. Water use and power are inextricably linked where water use, from source and conveyance to wastewater treatment, requires energy. Given power shortages and water scarcity across the West, it is important that policy makers, water and energy experts, and the public understand and consider these links.

Comment No. 1-10

Recommendation:
We recommend the FEIS discuss and evaluate the relationship between water supply and power requirements. The FEIS should include a description of the projected power needs of the Kane Springs Valley Groundwater Development Project, associated CSI development, and the long-term availability of this power.

Describe back-up water supplies. The estimated range of perennial yield of the Kane Springs Valley Hydrographic Basin is great--500 acre-feet per year (afy) to 5,000 afy (pps. 4-6 to 4-7). Other uncertainties include the inflow and outflow with other hydrographic basins; effects of changing climate and drought; and the need to reduce or stop groundwater withdrawals pursuant to the Stipulated Agreement and Memorandum of Agreement to prevent adverse effects on the Moapa dace and Muddy River Springs (Appendix A). Therefore, the availability of alternative water sources will be necessary to ensure a reliable supply.

Comment No. 1-11

Recommendation:
We recommend the FEIS describe back-up water sources which can be used if actual groundwater yield is 500 afy versus 5,000 afy, or if Stipulated Agreement "trigger points" requiring reduction or cessation of pumping are reached.

Response to Comment No. 1-9

The Proposed Action is a request for a right-of-way from the BLM. It is the responsibility of the Nevada Division of Water Resources to administer and enforce Nevada water law, including appropriation of groundwater and surface water in the state of Nevada. The allocation of water supplies to the LCWD and CSI is under the jurisdiction of the Nevada State Engineer. The distribution, use, and potential reuse of water in the CSI development would be governed by a General Improvement District, or other regulatory agency tasked with overseeing these resources. In addition, the Nevada State Engineer in ruling 5712 noted that "Testimony was provided that indicated conservation measures are in place for the planned development (CSI) similar to traditional development measures associated with development in southern Nevada that have been adopted and imposed, and there is no evidence that the appropriation of water from Kane Springs Valley will damage the environment of the Valley.

Response to Comment No. 1-10

Projected annual power needs of the Kane Springs Valley Groundwater Development Project are estimated at 2,000 MWh or .22 MW for wells pumping 1,000 afy and 10,000 MWh or 1.1 MW for wells pumping 5,000 afy. This information has been added to Chapter 4.18. The CSI development is a separate action from the Proposed Action. The CSI Development would occur in the absence of the Proposed Action. However, in the interest of understanding reasonable, foreseeable future actions in the region of influence, the Final EIS contains an expanded discussion of CSI's proposed actions in Clark and Lincoln County. This information has been added to Chapter 4.20.3.3.2.

Response to Comment No. 1-11

It is the responsibility of the Nevada Division of Water Resources to administer and enforce Nevada water law, including appropriation of groundwater and surface water in the state of Nevada. The allocation of water supplies to the LCWD and CSI is under the jurisdiction of the Nevada State Engineer. The identification of backup water sources to be used if the actual groundwater yield for the KSV project is 500 afy versus 5,000 afy is out of the scope of this EIS and is the responsibility of the LCWD or applicable water purveyor. More information can be referred to in Chapter 1.4.3 – Public Controversy.

State the source of water for the projected delivery of 5,000 afy. The DEIS states that this project will construct facilities and infrastructure to pump and convey up to 5,000 afy for delivery to the northern portion of Coyote Spring Valley (p. ES-1). The Nevada State Engineer's Ruling 5712 permitted 1,000 afy for the four LCWD applications filed for water right appropriations from the Kane Springs Valley Hydrographic Basin. In this ruling the State Engineer concludes that to permit the appropriation of water in an amount greater than permitted under this ruling would conflict with existing rights and threaten to prove detrimental to the public interest (Appendix B, Ruling 5712, p. 22).

Comment No. 1-12

Recommendation:
We recommend the FEIS describe the source of water for the remaining 4,000 afy to be delivered by the proposed project.

Response to Comment No. 1-12
The Nevada State Engineer has permitted 1,000 afy in the Kane Springs Valley Hydrographic Basin to LCWD. LCWD submitted 4 additional water rights applications to the Nevada State Engineer in April 2006. Additional groundwater studies are ongoing in the area to support the request. The amount and timing of any future water allocations would be speculative at this time. However, it is the intent of the LCWD to develop and convey any and all permitted water rights approved by the State Engineer to their service territory, subject to all regulation and stipulations imposed by the State Engineer or other permitting agencies.

Climate Change

Provide a short discussion of climate change and its potential effects on the proposed action and related CSI development. A number of studies specific to the Colorado River Basin, which includes the project area, indicate the potential for significant environmental impacts as a result of changing temperatures and precipitation.[1] A more extensive discussion of climate change and its potential effects on the proposed groundwater development action would better serve decision-making on this project, as well as long-term, regional water management planning and planned development.

Comment No. 1-13

Recommendation:
We recommend the FEIS include a separate discussion of climate change and its potential effects on the proposed groundwater development project and associated CSI development. We recommend this discussion provide a short summary of climate change studies specific to the project area and Colorado River Basin, including their findings on potential environmental and water supply effects and their recommendations for addressing these effects. For example, if there is a projected 10-20% reduction in precipitation for the Colorado River Basin[2], we recommend the FEIS describe the potential effect on this and other groundwater development projects, projected quantity and sustainable groundwater withdrawal from the carbonate-rock aquifer, and existing and future urban development.

Response to Comment No. 1-13
The BLM acknowledges that the potential effect of climate change on water availability and future use is a dynamic and controversial topic. In the context of the Proposed Action, it is beyond the scope of this EIS. However, in the interest of understanding past, present, and reasonable foreseeable natural events that are likely to occur in the region of influence, a discussion of climate change has been added to Section 4.20.3.1 of the Cumulative Impacts section in the FEIS.

General Comments

Provide a summary of the results of Section 7 Endangered Species Act consultation. The DEIS states that a Biological Assessment (BA) will be prepared for the proposed Action and submitted to the US FWS pursuant to Section 7 of the Endangered Species Act (ESA).

Comment No. 1-14

Recommendation:
We recommend the FEIS provide a summary of the results of the Section 7 ESA consultations. The BA and associated Biological Opinion or Decision Memo from the US FWS should be included in an appendix.

<u>Response to Comment No. 1-14</u>
Chapter 4.5.1.1 of the FEIS has been updated to include the effect determinations for threatened and endangered species from the Section 7 ESA consultations (Biological Assessment). A copy of the Biological Opinion for the Proposed Action will be included as part of the Record of Decision because it will be issued after the FEIS (BO release expected no later than February 10, 2008).

JIM GIBBONS
Governor

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

SOUTHERN REGION
4747 Vegas Drive
Las Vegas, Nevada 89108
(702) 486-5127 · Fax (702) 486-5133

August 3, 2007

NDOW-SR# 07-319

Ms. Gosia Sylwestrzak
Nevada State Clearinghouse
209 East Musser Street, Room 200
Carson City, NV 89701-4298

SAI #: E2007-418
Due Date: August 13, 2007
Project: Draft Environmental Impact Statement (DEIS) for Kane Springs Valley Groundwater Development

Dear Ms. Sylwestrzak:

Comment No. 2.1

Thank you for notification of the subject DEIS. As you know the Nevada Department of Wildlife is a cooperating agency to the NEPA process associated with the proposed project. We have found that the vast majority of our thoughts conveyed during working group meetings with the project proponent, as well as our review of an earlier draft of the EIS have been considered and incorporated where applicable. We look forward to continuing cooperation in this productive process.

Response to Comment No. 2-1

The BLM appreciates NDOW's participation as a cooperation agency.

Sincerely,

D. Bradford Hardenbrook
Supervisory Habitat Biologist

CS/DBH:dbh

cc: NDOW, Files

RECEIVED

AUG 0 9 2007

DEPARTMENT OF ADMINISTRATION
OFFICE OF THE DIRECTOR
BUDGET AND PLANNING DIVISION

8/1

Rebecca Palmer

From: Clearinghouse [clearinghouse@budget.state.nv.us]
Sent: Monday, June 25, 2007 10:36 AM
To: Rebecca Palmer
Subject: E2007-418 DEIS for Kane Springs Valley Groundwater Development - Nevada Groundwater Projects Office

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0209 Fax (775) 684-0260
DATE: June 25, 2007

State Historic Preservation Office

Nevada SAI # E2007-418
Project: DEIS for Kane Springs Valley Groundwater Development

Follow the link below to download an Adobe PDF document concerning the above-mentioned project for your review and comment.

http://www.blm.gov/nv/st/en/prog/planning/groundwater_projects/ksv_project/issue_draft_eis_for.html

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Monday, August 13, 2007.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Gosia Sylwestrzak, (775) 684-0209 or mailto:clearinghouse@budget.state.nv.us.

____No comment on this project ____Proposal supported as written

AGENCY COMMENTS:

Signature: Rebecca L Palmer Date: 7/23/07

Comment No. 3.1

The SHPO reviewed the EIS for the subject undertaking. The SHPO has no record of receiving the cultural resources inventory report and the Bureau of Land Management's determination of eligibility and effect for review. If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by E-mail at rlpalmer@clan.lib.nv.us.

Response to Comment No. 3-1

The BLM will continue to consult with the Nevada SHPO as part of the Section 106 process. The cultural resources inventory report will be submitted to the Nevada SHPO in early 2008.

"Josh DeGayner"
<jdegayner@mvdsl.com>
08/23/2007 10:58 AM

To <nvgwprojects@blm.gov>, <penny_woods@nv.blm.gov>
cc
bcc
Subject Moapa Band of Paiutes Kane Springs Groundwater Development Comment

Penny –

Hi. Here are the comments regarding water resources. I'm sorry they are late! This document also lacsk some citations, I didn't have time to read the actual CH2MHILL report but I do refer to some of their findings directly from the DEIS. I hope the lack of citations does not cause any problems, but there are studies which back up the main points. I have spoken with Marty Mifflin, the Tribe's hydrologist and from what I understand he agrees with my perspective on the issue. Exhibit 54, which I refer to but do not have the actual document was presented to the state engineer. My understanding is that this study shows that pumping from coyote springs basin has a 1:1 impact on spring flow (1 gallon removed from the carbonate aquifer results in 1 gallon less discharge from the spring area). Anyways, sorry this document is not more complete, but the main purpose at this point is to bring these issues to the table.

Josh DeGayner
Water Quality Technician
Moapa Band of Paiutes
(702)-865-2090
jdegayner@mvdsl.com

Moapa Band of Paiutes Department of Water Resources Comment on Kane Springs Valley Groundwater Development Project.doc

Moapa Band of Paiutes Department of Water Quality Comment on Kane Springs Valley Groundwater Development Project

The Moapa Band of Paiutes would like to express their concern over increased pumping in the Kane Springs Valley. Since time immemorial the Moapa Band of Paiutes have lived near the Muddy River and depended on the spring discharge for their livelihood. Many cultural plants and areas are sustained by the springs which are fed by the 13 hydrographic basins that make up this system. To this day the Moapa Band of Paiutes lease a senior water right for surface water diversions on the Muddy River. The Tribe's federally reserved water rights are pending. This water is used to irrigate the tribal farm. The cumulative impacts from pumping in Coyote Springs Valley, Kane Springs Valley, and other hydrographic basins could decrease Muddy River Flows and make this water right unusable. The effects of decreasing spring flow in the Muddy River Springs Area could also further endanger the Moapa Dace, and degrade the riparian habitat that many native species depend on.

Kane Springs Valley is considered part of the White River Flow System. This hydrologic system has been the focus of several groundwater studies. The Muddy River Springs area is thought to discharge about 36,000 AFY. These springs are fed by the hydrographic basins above the Coyote Springs Valley, including Kane Springs Valley.

There seems to be some disagreement over the quantity of water that moves via interbasin transfer from Kane Springs Valley to Coyote Springs Valley. Older estimates were as small as 35 AFY (USGS 1971). Newer studies suggest total recharge to the

Kane Springs Valley is about 18,000 AFY, while interbasin transfer to Coyote Springs Valley is about 16,000 AFY (CH2MHILL 2006). The study by CH2MHILL estimates that 5,000 AFY of the total recharge is local recharge (infiltration from precipitation). In section 4-9 of the DEIS the claim is made that, "South of the fault zone, in Coyote Spring Valley, the Kane Springs Wash fault zone would likely impede the propagation of the cone of depression migrating south towards the Muddy Springs area.". It seems that the movement of 16,000 AFY between Kane Springs Valley and Coyote Springs Valley demonstrates that there is a very effective hydrologic connection between the two valleys. Any pumping in Kane Springs would change the hydraulic gradient and decrease the amount of interbasin transfer in the system.

Based on Nevada State Engineer Ruling 5712 in February 2007, less than 500 AFY is considered the Kane Springs Valley perennial yield. LCWD has currently been permitted 1000 AFY and has submitted applications for an additional 17,380.

It is the opinion of the Tribe that groundwater in the White River Flow System can not be pumped without impacting flow rates to some extent at the Muddy River Springs area. Recent studies have shown that there is near to a one to one impact in the Springs area from pumping other hydrographic basins that ultimately feed the springs. It doesn't matter if the perennial yield of Kane Springs Valley is 500 AFY or 5,000 AFY. After this water enters the carbonate system, based on the hydraulic gradient, it will reach the spring system at some point in time, unless it is removed by pumping. Water budget balance studies have been done on the White River Flow System that suggest the majority of the recharge from these 13 basins is ultimately discharged in the Muddy River Springs Area. The water that is not discharged passed under the springs, but the springs are higher in elevation and will be affected first.

The MOA between SNWA, FWS, CSI, and the Moapa Band of Paiutes sets certain trigger levels and if these levels are reached the parties will decrease or cease pumping at certain well locations. The first trigger level is 3.0 cfs. This is the same trigger level agreed upon between LCWD and FWS. The parties in this MOA are senior users to LCWD's recently acquired groundwater rights. The cumulative impact of other parties, such as LCWD pumping will cause a greater impact on the springs, and cause the trigger levels to be reached sooner. This will cause harm to senior water users by limiting the amount of water they can divert.

Table 3-6 in the DEIS shows that the Muddy River Springs area and Coyote Springs Valley are in a water deficit situation, and are designated basins by the Nevada State Engineer. Because these basins are already in a water deficit situation it would be prudent to limit pumping from basins such as Kane Springs Valley, which recharge and feed the Muddy River Springs Area.

Comment No. 4.1

There seems to be some error on Table 3-6. Order No. 1169 required pumping at least 50% of the water rights permitted in Coyote Spring Valley hydrographic basin. Order No. 1169 states that the State Engineer has previously granted groundwater permits for 16,300 AFY in Coyote Springs Valley. Order No. 1169 also holds all other

Response to Comment No. 4-1
Table 3-6 has been revised in the Final EIS.

applications in abeyance until the pump test and subsequent study has been completed. Table 3-6 shows there being 35,096 AFY currently permitted in Coyote Springs Valley. What is the source of this discrepancy?

Delaine Spilsbury
PO Box 1055
McGill, NV 89318
Phone/Fax 775-235-7557

August 20, 2007

TO: BLM/Groundwater Projects Office
Penny Woods

FROM: Delaine Spilsbury, Ely Shoshone Tribe, Director-Bristlecone Alliance

REF: Kane Springs Valley DEIS

I am protesting the use of scientific studies and data that were prepared for project proponent, Vidler Water Company.

Comment No. 5.1

Is this not showing partiality to the proponent? Is it not flawed thinking? And why is the BLM permitting the wolf to protect the chickens? As I understand, the BLM mission is stewardship of public lands. Obviously collusion with the proponents can be viewed as counter to that mission.

6.0 - References: CH2MHILL. 2006:
Hydrologic Assessment of Kane Springs Valley Hydrologic Area:
Hydrologic Framework, Hydrologic Conceptual Model and Impact Analysis prepared by the Project proponent, Vidler Water Company and Lincoln County Water District was presented to the Office of the Nevada State Engineer.

And didn't the Nevada State Engineer in his ruling on water rights applications reject the Assessment on Kane Springs?

Thank you,

Delaine Spilsbury

Response to Comment No. 5-1

Allocation of groundwater within the Kane Springs Valley Hydrographic Basin is under jurisdiction of the Nevada State Engineer. A summary of the Nevada State Engineers' ruling on the appropriation of groundwater for this project is provided in section 3.3.3.3.1 of the FEIS. LCWD conducted groundwater studies to support their water rights application. An interdisciplinary team of resource specialists selected by the BLM and its Cooperating Agencies, reviewed the basin-specific data prepared by the Applicant, in addition to other regional water resources data to analyze the potential effect of implementation of the Proposed Action.

To: BLM/Groundwater Projects Office
Penny Woods
From: Richard Spilsbury
Ref: Kane Springs Valley DEIS

Comment No. 5.2

I am protesting that the draft EIS does not analyze the cumulative effects on the carbonate aquifers in effected counties. Water from carbonate aquifers must be moving, or otherwise it would be salt water. If it is moving, it's feeding springs somewhere. Draining carbonate aquifers will eventually effect springs. It doesn't take a hydrologist to figure this out. Just because you don't study this, doesn't mean it won't happen.

Thank you,

Richard A. Spilsbury
PO Box 1055
McGill, NV 89318

Response to Comment No. 5-2

Cumulative impacts are discussed in Chapter 4.20

To: BLM/Groundwater Projects Office
Penny Woods
From: Richard Spilsbury
Ref: Kane Springs Valley DEIS

I am protesting the fact that the draft EIS does not study a full range of alternatives.

Comment No. 5.3

1. Conservation. Pat Mullroy herself wrote the forward to the NRDC publication "In Hot Water," which claims that through conservation, cities can grow without increasing water use.
2. Desalination. Water can be desalinated offshore and traded for a bigger allotment of the Colorado River.
3. Responsible Growth. Cancer-like growth of Southern Nevada should not be supplemented by stunted growth of Rural Nevada.
4. Development of water saving crops. Southern Nevada could financially support the development of crops that use less water in exchange for a bigger allotment of Colorado River water.
5. Conservation in other areas. Southern Nevada could financially support conservation in the Colorado River Basin in exchange for a bigger allotment of the Colorado River.

There are a number of alternatives to doing the most environmentally damaging thing first. Why the hell are we not even considering them?

Thank you,

Richard A. Spilsbury
PO Box 1055
McGill, NV 89318

Response to Comment No. 5-3

This EIS is in response to a Lincoln County Water District request for a right of way across federal lands managed by the BLM. The Proposed Action is the construction and operation of the Kane Springs Valley Groundwater Development Project, within a congressionally designated utility corridor. Alternatives considered included alternative infrastructure locations, and the no action alternative (denying the right of way application). Chapter 2.4 explains the criteria by which alternatives are considered.

To: BLM/Groundwater Projects Office
Penny Woods
From: Richard Spilsbury
Ref: Kane Springs Valley DEIS

Comment No. 5.4

I am protesting the fact that the draft EIS is full of b*llsh!t. That's right. The (un)scientific studies and data came directly from the people who want to take the water. None of these "studies" has been appropriately peer reviewed. In fact, the Nevada State Engineer has rejected them.

We need honest, thorough data. We don't want the fox's lies that the hen-house is safe.

Thank you,

Richard A. Spilsbury
PO Box 1055
McGill, NV 89318

Response to Comment No. 5-4

The data analyzed for this EIS included regional studies conducted by federal and state agencies, private developers and their consultants, more localized studies conducted by the Applicant and site specific biological and cultural surveys conducted by the BLM for the Proposed Action. The BLM acknowledges that the Applicant and other entities continue to expand the body of knowledge regarding groundwater development in the project area and regional aquifer system to support future water rights applications. That data will be used by the Nevada State Engineer in its decision to approve or deny the application. Existing and permitted water rights will be subject to the terms and conditions directed by the Nevada State Engineer. Construction and operation of infrastructure associated with the Proposed Action on federal lands will be subject to the terms and conditions directed by the BLM as part of the right of way grant. Uncertainties related to this project are discussed in Incomplete and Unavailable Information section at the beginning of Chapter 4.

To: BLM/Groundwater Projects Office
Penny Woods
From: Richard Spilsbury
Ref: Kane Springs Valley DEIS

Comment No. 5.5

I am protesting the fact that the draft EIS is not doing a full analysis of the impacts of the proposed pipeline and wells. Monitoring the effect of the pipeline without monitoring the effect of the mining and exportation of water is like monitoring the bullet without monitoring the effect of the bullet wound. Won't this effect public lands? Of course. This is dereliction of duty.

Apparently, the Department of the Interior has decided that the BLM doesn't have a purpose – other than to appear bureaucratic. Their next step will be cutbacks – and when the BLM won't stand up for us, Americans won't care. In the past, the BLM has promised to analyze all of the effects. Keep your promise!

Thank you,

Richard A. Spilsbury
PO Box 1055
McGill, NV 89318

Response to Comment No. 5-5

The BLM uses a comprehensive process to determine whether rights of way on BLM-managed lands should be granted. This process includes compliance with the requirements of the National Environmental Policy Act and the Council for Environmental Quality regulations, BLM planning regulations, manuals and handbooks, and applicable policy documents. While BLM does not have the authority over pumping and exportation of water this EIS discloses impacts from proposed alternatives on public lands.

To: BLM/Groundwater Projects Office
Penny Woods
From: Richard Spilsbury
Ref: Kane Springs Valley DEIS

Comment No. 5.6

I am protesting the BLM's response to public comment. Listing how many comments there were on each subject is the very minimum anyone could possibly do without totally ignoring us.

I've received no replies to any of my comments.

I've never heard of any of my comments being responded to.

In fact, I've never heard of anyone's comments recently being responded to.

At this rate, sooner or later, the American public will start to think that the BLM is just a rubber stamp for big business. When that happens, we won't want our tax money wasted on the BLM.

Thank you,

Richard A. Spilsbury
PO Box 1055
McGill, NV 89318

Response to Comment No. 5-6

As explained in Chapter 1.5 - Scoping, the BLM considered comments received through public scoping when developing the scope of issues and alternatives to be analyzed in the Draft EIS. All comments received during scoping were systematically reviewed by an interdisciplinary team of resource specialists from various BLM offices, representatives from cooperating agencies, and BLM's EIS consultants. See also response to Comment 5-5.

CENTER for BIOLOGICAL DIVERSITY

Via Electronic Mail and U.S. Mail

August 20, 2007

Penny Woods, Project Manager
Bureau of Land Management, Nevada State Office
Groundwater Projects Office
P.O. Box 12000
Reno, NV 89520
Fax: 775-861-6689
nvgwprojects@blm.gov

Re: Kane Springs Valley Groundwater Development Project, Draft Environmental Impact Statement

Dear Ms. Woods,

The Center for Biological Diversity ("Center") submits these comments on the Draft Environmental Impact Statement ("DEIS") for the Kane Springs Valley Groundwater Development Project ("project"). The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 35,000 members throughout the western United States, including many members who live and recreate in Nevada. In light of the deficiencies in the DEIS discussed below, the Center urges the BLM to revise and re-circulate the DEIS before moving forward with project approval.

As detailed below, the DEIS fails to meet the requirements of the National Environmental Policy Act ("NEPA"). In addition, the BLM's review of this project fails to meet its obligations under the FLPMA and the Endangered Species Act. These comments focus largely on BLM's failure to adequately identify and analyze the project's potential impacts to rare, threatened and endangered species or to examine any alternative that would protect these imperiled resources. In addition, the DEIS is invalid because, among is other shortcomings, it: fails to provide a complete and accurate environmental baseline from which the impacts of the action can be measured; fails to consider a reasonable range of alternatives; fails to undertake a meaningful cumulative impacts analysis; fails to provide adequate data on the likely impacts to biological resources of these public lands including rare, threatened and endangered species; fails to adequately protect water resources on public lands; and fails adequately identify and analyze the impacts of global warming on the resources or this project's contribution to global warming. BLM has also failed to protect reserved Federal water rights on public lands and to prioritize the use of public water resources by native wildlife and riparian dependent species.

Environmental Baseline: The description of the affected environment or environmental baseline fails to accurately identify current status of all of the of the rare, sensitive, threatened

Tucson · Phoenix · San Francisco · San Diego · Los Angeles · Joshua Tree · Silver City · Portland · Washington, DC

Lisa T. Belenky · Staff Attorney ·1095 Market St, Ste. 511 · San Francisco, CA 94103-1628
tel: (415) 436.9682 ext. 307 fax: (415) 436.9683 lbelenky@biologicaldiversity.org www.BiologicalDiversity.org

Comment No. 6.1

and endangered species in the project area that may be directly or indirectly affected by the proposed project as well as the cumulative impacts to such species. For example, BLM only surveyed for plants in the "project area" (DEIS at 3-34). However, the project will draw down ground water in a large area and will clearly affect plants outside of the "project area." This inappropriate focus on the area of surface disturbance and construction, and consequent failure to take a hard look at the impacts of the water extraction project, pervades the DEIS. See DEIS at 3-29 to 3-44. BLM's explanation that the DEIS uses three different "areas" does little to clarify the situation. DEIS 3-1 (describing project area, study area or ROI, and Area of Potential Effect). The definition of the so-called "Region of Influence (ROI) varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or Alternatives." DEIS 3-1. This methodology is circular and leads the agency to examine only the most obvious and already well-documented likely impacts of the proposed action. It cannot be used to justify ignoring impacts in areas where the agency has not pre-determined that they will occur. Unfortunately this appears to be an attempt to shore up BLM's decision to unlawfully narrow its examination of the far-reaching impacts of the proposed action.

NEPA requires BLM to "describe the environment of the areas to be affected or created by the alternatives under consideration." 49 C.F.R. § 1502.15. In Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit stated that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." FLPMA also requires that BLM prepare and maintain a current inventory of all public lands and their resources. 43 U.S.C. § 1711(a). The DEIS and BLM's decision must be based on an adequate inventory of the resources of the public lands that may be affected by the proposed project including, but not limited to: special status, rare, and sensitive species; water resources including both groundwater and surface water resources; and riparian vegetation communities. Without a clear understanding of the current status of the affected public lands BLM cannot comply with NEPA or FLPMA. Unfortunately, the DEIS clearly shows that BLM has not adequately inventoried the resources of the public lands that may be affected by this proposed action, opting instead to focus primarily on the construction of the well field and pipelines. While these areas are important, this massive groundwater extraction project will impact a far greater area and many other resources for which additional baseline data should have been provided.

Comment No. 6.2

Range of Alternatives: An EIS must include a reasonable range of alternatives including alternatives that will avoid or minimize impacts to rare, sensitive and special status species. The DEIS failed to include any alternative that would lessen the impacts on these species or support the recovery of these species in the whole project area in order to fulfill BLM's obligations under the Endangered Species Act ("ESA") to promote conservation of listed species and work towards recovery of these species. See ESA § 7(a)(1).

NEPA requires that, in preparing and EIS, each agency "[r]igorously explore and objectively evaluate all reasonable alternatives" to the proposed action. 40 C.F.R. § 1502.14. The "existence of a viable but unexamined alternative renders and [EIS] inadequate." Idaho Conservation League v. Mumma, 956 F.2d 1508, 1519 (9th Cir. 1992). See Resources Ltd., Inc.

Response to Comment No. 6-1

Chapters 3.4.4 and 3.5.5 of the FEIS describe the environmental baseline for special status plant species; Chapters 3.5.2 and 3.5.3 describe the environmental baseline for special status wildlife species. Direct and indirect affects of the project on special status plants and wildlife are described in Chapters 4.4.1.2, 4.4.1.3, 4.5.1.1, and 4.5.1.2. Cumulative impacts are described in Chapters 4.20.4.3 and 4.20.4.4. The project area, Region of Influence, and cumulative resource analysis areas for special status species are based on the anticipated impacts on surface water and groundwater in Chapters 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.1.4, and 4.3.1.5. Groundwater drawdown would occur in the deep carbonate aquifer (greater than 900 feet below ground surface). Therefore, there would be no impact on vegetation. The baseline condition of the affected environment is described in Chapter 3. Any potential impact of pumping of the Kane Springs Valley Groundwater Development project on the Muddy River Springs area is mitigated through the stipulated agreement between the LCWD and USFWS.

Response to Comment No. 6-2

Chapters 1.4.3 and 2.0 address alternatives development. The LCWD is requesting a right of way across federal lands managed by the BLM. The Proposed Action is the construction and operation of the Kane Springs Valley Groundwater Development Project, within a designated utility corridor. Alternatives considered included alternative infrastructure locations, and the no action alternative (denying the right of way application). The Proposed Action deviates from a congressionally approved utility corridor as a means to minimize impacts to vegetation, soils and desert tortoise habitat. BLM analyzed an alternative whereby the alignment stayed within the congressionally designated corridor as Alternative 1. Desert tortoise and rare plant surveys were conducted within the area of direct effects (construction right of way).

Comment No. 6.2 (Cont.)

v. Robertson, 35 F.3d 1300, 1307 (9th Cir. 1993). An alternative is not rendered unviable if it is outside the jurisdiction of the lead agency. 40 C.F.R. § 1502.14(c). Quite to the contrary, analysis of "reasonable alternatives not within the jurisdiction of the lead agency" is required. Id.

BLM simply assumes that the proposed groundwater pumping will go forward with or without the proposed action. This undermines BLM's examination of the full impacts of the proposed action and a reasonable range of alternatives. In fact, the DEIS does not analyze any alternative that would have fewer impacts on surface water resources, fish and other riparian dependent species, or on the desert tortoise and its occupied habitat including critical habitat. For example, BLM fails to examine any alternative sites or a project that would extract less groundwater.

Comment No. 6.3

Biological Resources: The DEIS fails to adequately identify and analyze direct, indirect, and cumulative impacts to the desert tortoise and its critical habitat. The DEIS provides only cursory information about the current status of the desert tortoise in this area and provides no meaningful evaluation of how the permanent and temporary loss of significant occupied habitat—including critical habitat—will impact the survival and recovery of the species in the immediate project area or how changes in surface water resources and hydrology may destroy or adversely modify critical habitat and inhibit recovery of the species.

In addition, the DEIS fails to look at secondary or indirect impacts of the project such as increased traffic and the presence of predators such as ravens attracted by trash and other consequences of increased human disturbance in this area. The DEIS states that workers will be required to remove garbage daily (DEIS at 4-17) as though this were the beginning and end of the issue. In fact, littering and open trash receptacles are already prohibited in many areas but this has not stopped the accumulation of trash and garbage that attracts ravens. Unfortunately, increased human presence leads to increased trash and BLM cannot simply close its eyes to this fact and wish it away. Along with increased perching opportunities, human trash is highly likely to increase ravens in the area and thereby cause impacts to the desert tortoise population. In addition, there is no provision for so-called "tortoise fencing" along the roads where heavier traffic during construction and operation will lead to additional roadkill both directly killing desert tortoises and the additional roadkill in turn will attract additional predators including ravens.

The short- and long-term impacts of groundwater pumping on fish and riparian vegetation communities is also inadequately identified and analyzed in the DEIS. For example, BLM fails to identify the full range of likely impacts to the Moapa dace and other riparian dependent species in the Muddy River ecosystem. See DEIS at 4-18. Instead, BLM attempts to skip the steps required by NEPA—identification and analysis of impacts—and jump ahead to simply assume that what ever the impacts may be they will all be adequately mitigated by the measures outlined in the Stipulated Agreement between USFWS and LCWD regarding senior water rights. See DEIS at 1-6. While that agreement is important, it does not in anyway lessen BLM's duty to comply with NEPA and take a "hard look" at the impacts of the proposed project. More importantly, that narrowly tailored agreement cannot and does not provide all of the mitigation necessary for this project's impacts to biological resources in general or the Moapa

Response to Comment No. 6-2 Applicant proposed environmental protection measures to minimize construction related impacts are incorporated in the project design and outlined in Appendix C (Standard Construction and Operation Procedures). The BLM would monitor the effectiveness of approved mitigation measures (i.e. desert tortoise fencing, installation of perch inhibitors, and revegetation). A Biological Assessment was prepared as part of Section 7 consultation under the ESA. Additional mitigation measures may be required by the USFWS through Section 7 or Section 10 consultation. The Applicant would also be required to comply with stipulations mandated by the Nevada State Engineer for allocation of water supplies, and the stipulated agreement between the LCWD and USFWS for potential impacts of groundwater pumping on the Muddy River Springs area.

Response to Comment No. 6-3

The BLM is consulting with the USFWS through the ESA Section 7 process. A Biological Assessment has been prepared for the project. The USFWS may request additional terms and conditions or mitigation measures with the release of the BO (anticipated by February 10, 2008). Further description of the analysis has been added to sections 4.5.1.1.2 Moapa Dace, 4.5.1.1.3 Southwestern willow flycatcher, 4.5.1.1.4 Yellow-billed Cuckoo, and 4.5.1.2.4 Fisheries.

dace and the Muddy River ecosystem in particular. For example, the project will also have growth inducing impacts, which will in turn increase pressures on groundwater and other resources that will both directly and indirectly affect all of the biological resources of the area.

Comment No. 6.4

Surface Waters: The DEIS also failed to adequately assess the impacts to perennial, seasonal, and ephemeral surface water resources including, but not limited to, springs, seeps, creeks, and rivers. In the arid Great Basin, the loss of even a small amount of surface waters can be devastating to fish, plants, and riparian vegetation communities and may result in the collapse of entire ecosystems that depend on these resources. BLM completely ignores the fragile state of the ecosystem in this area. Indeed, BLM does not even acknowledge the impacts of the current drought or the cumulative impacts to water resources that are the result.

Comment No. 6.5

Cumulative Impacts: The DEIS does little more than list many of the projects that will likely have cumulative impacts on the same resources as the proposed project. The DEIS fails to adequately identify or analyze the cumulative impacts these projects will have on the fragile biological resources of these public lands. All of these projects will negatively affect the biological resources of this area through, inter alia, increased traffic and noise, increased fragmentation of wildlife habitat, increased night lighting, increased loss of surface water resources, and increased trash which attracts predators such as ravens. The long-term and cumulative impacts to the ecosystem as a whole, desert tortoise survival, and critical habitat due to the proposed extraction of groundwater should also have been thoroughly examined but were not.

Comment No. 6.6

Global warming and Climate Change: The DEIS fails to provide any information about the project's greenhouse gas ("GHG") emissions whether due to the energy used for the pumping and transportation of water, for construction of the project, for workers traveling to and from the site during construction and operation or otherwise. The DEIS also fails to look at the cumulative impacts to global warming from this and other projects in the area. Nor does the DEIS estimate or discuss the emissions that would be caused by project which is not only likely to increase development in Las Vegas but is intended to do so. Because the DEIS fails to provide a complete inventory of the proposed project's greenhouse gas emissions, it fails to comply with NEPA which requires that all impacts be identified and disclosed to the public. This is unacceptable.

BLM must fully disclose and evaluate the project's greenhouse gas and global warming implications. It must fully analyze the proposed project's direct, indirect, and cumulative greenhouse gas emissions. The greenhouse gas emissions of each project component must be quantified and disclosed, including construction, operation of the groundwater pumping system itself, transportation of the water from the project site, and other emissions associated with worker transport during construction and operation of the project. The impact of these emissions must be fully discussed and placed in proper context. Alternatives which reduce or eliminate the proposed project's total GHG impacts must be proposed, including the adoption of energy conservation measures both at the project site and in Las Vegas where the project is intended to foster additional urban and suburban growth. BLM should also disclose an estimate of the economic cost of the proposed project's greenhouse gas emissions. Information on calculating

Response to Comment No. 6-4

Potential impacts to surface water resources have been analyzed and are discussed in section 4.3.1.1. These impacts are expected to be minor, primarily limited to those related to construction activities and would be further minimized by application of mitigation measures. Impacts to surface water from groundwater pumping are not anticipated, as the water would be pumped from deep carbonate aquifer (greater than 900 feet below ground surface) which does not appear to be connected with the surface water in the Kane Springs Valley. Any potential impact of pumping on the down gradient Muddy River Springs area surface water resources would be mitigated through the stipulated agreement between the LCWD and USFWS.

Response to Comment No. 6-5

The Proposed Action would not impact the following resources: Geological Resources, Mineral Resources, Livestock Grazing, Transportation, Wilderness, Recreation, Air Quality, Noise, Environmental Justice, Hazardous and Solid Waste, Paleontological Resources, and Heritage Resources and Historical Properties. Therefore, there would be no cumulative impacts to these resources from the Proposed Action. The impact on groundwater resources is discussed in section 4.20.4.2. Impacts on the ecosystem are discussed in sections 4.4, 4.5, 4.20.4.3, 4.20.4.4, 4.20.4.4.2, and 4.20.4.4.3. The impact on desert tortoise is discussed in section 4.20.4.4.1.

Response to Comment No. 6-6

The BLM acknowledges that the potential effect of climate change on water availability and future use is a dynamic and controversial topic. In the context of the Proposed Action, it is beyond the scope of this EIS. However, in the interest of understanding past, present, and reasonable foreseeable natural events that are likely to occur in the region of influence, a discussion of climate change has been added to the Cumulative Impacts section 4.20.3.1 in the FEIS.

Estimates of greenhouse gas emissions for construction of the project are included in Table 4-3 in Chapter 4.9. The number of vehicles and construction equipment that will be needed for construction of the project are unknown and emissions cannot be quantified at this time. However, the projected annual power needs of the Kane Springs Valley Groundwater Development Project are estimated at 2,000 MWh or .22 MW for wells pumping 1,000 afy and 10,000 MWh or 1.1 MW for wells pumping 5,000 afy. Greenhouse gas emissions will vary depending on the source of the power that is delivered to the project area; however, estimates have been provided in Chapter 4.9.1 based on projected annual operation power needs. For the reasons listed in this paragraph, the economic impact of greenhouse emissions associated with the project cannot be quantified.

GHG and reducing emissions is readily available to BLM and its failure to identify or analyze this issue in the DEIS is inexplicable.

Comment No. 6.6 (Cont.)

Global warming is one of the foremost problems our nation faces today and implicates all aspects of society, including environmental health and biodiversity, public health, the stability of our economy, and national security. Overall, the World Health Organization estimates that as of the year 2000, 154,000 deaths and the loss of 5.5 million daily adjusted life years per year worldwide are attributable to global warming (WHO 2002). This toll is due to the combined impacts of higher temperatures, increasing whether variability such as more frequent and intense droughts and floods, a pattern of more violent tropical storms, as well as more subtle, gradual changes that can also profoundly damage public health (Epstein and Mills 2005).

The impacts to plants and animals are well documented. For example, the endangered Quino checkerspot butterfly (*Euphydryas editha quino*) which occurs in southern California and Baja, Mexico is threatened by the significant warming and drying of its habitat from global warming (Parmesan and Galbraith 2004). The drying and warming is causing the species' host plant to die off and dry up prior to the completion of caterpillar growth, resulting in mass starvation of young caterpillars (Parmesan and Galbraith 2004). When species cannot shift their ranges northward or to increased elevations in response to climate warming, they will become extinct (Parmesan and Galbraith 2004). Impacts are being felt by species found in Nevada and other parts of the Great Basin as well as throughout the desert southwest. For example, the impact of climate change on wildlife in the Great Basin such as the pika and desert dwelling bighorn sheep have been documented (Beever 2003, Epps 2004).

Conclusion: Thank you for this opportunity to provide comments on the DEIS for the Kane Springs Valley Groundwater Development Project. Because this DEIS is inadequate it should be revised and re-circulated to the public. We look forward to reviewing a revised DEIS that adequately identifies and analyzes the impacts of the proposed project and includes a meaningful range of alternatives. Please do not hesitate to contact me if you have any questions regarding the issues raised in these comments regarding the proposed project.

Sincerely,

Lisa Belenky
Staff Attorney

Literature Cited

Beever, E.A., *et al.* 2003, Patterns of Apparent Extirpation Among Isolated Populations of Pikas (*Ochotona princes*) in the Great Basin, Journal of Mammalogy, 84(1):37–54.

Epps, *et al.*, Effects of Climate Change on Population Persistence of Desert-Dwelling Sheep in California. 18 Conservation Biology at 102.

Response to Comment No. 6-6 (Cont.)

The Proposed Action is the shortest route available to convey groundwater. For this reason, it is the alternative with the least impact on greenhouse gas emissions because construction will take less time than if the route were a longer distance.

The KSV Groundwater Development Project is not intended to increase development in Las Vegas and would not have an impact on greenhouse gas emissions in that area.

Epstein, P.R. and E. Mills (eds.). 2005. Climate change futures health, ecological, and economic dimensions. The Center for Health and the Global Environment, Harvard Medical School. Cambridge, Massachusets, USA. Available at: http://www.climatechangefutures.org/. 142 pp.

Parmesan, C. and H. Galbraith. 2004. Observed impacts of global climate change in the U.S. Pew Center on Global Climate Change. Available at: http://www.pewclimate.org/docUploads/final%5FObsImpact%2Epdf. 67 pp.

World Health Organization (WHO). 2002. The World Health Report 2002. Available at: http://www.who.int/whr/2002/en/index.html. 4 pp.

SOUTHERN NEVADA WATER AUTHORITY
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August 15, 2007

Penny Woods, Nevada Groundwater Project Manager
U.S. Bureau of Land Management, Nevada State Office
P. O. Box 12000
1340 Financial Blvd
Reno, NV 89520-0006

Dear Ms. Woods:

SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE KANE SPRINGS VALLEY GROUNDWATER DEVELOPMENT PROJECT

On June 22, 2007, the Bureau of Land Management (BLM) issued the Draft Environmental Impact Statement (DEIS) for the Kane Springs Valley Groundwater Development Project. The Southern Nevada Water Authority (Authority) has reviewed the document and appreciates the opportunity to provide comments on the DEIS. The Authority represents seven-member water and wastewater agencies in southern Nevada, including Big Bend Water District, Boulder City, City of Henderson, City of Las Vegas, City of North Las Vegas, Clark County Water Reclamation District, and Las Vegas Valley Water District. The Authority's mission is to manage the water resources of southern Nevada and develop solutions that will ensure adequate future water supplies for the Las Vegas Valley. Our comments to the document are provided below.

Project Description

Comment No. 7.1

Chapter 2.1. A subchapter should be added to the Proposed Action describing the Lincoln County Water District (LCWD) and US Fish and Wildlife Service (USFWS) Stipulation Agreement, and the associated Mitigation, Monitoring and Management (MMM) Plan. The commitments under the MMM Plan, including the agreement to restrict or cease groundwater pumping in Kane Springs Valley, if specified trigger ranges of in-stream flow in the Warm Springs area are reached, are an integral part of the Proposed Action and need to be described in this section

Response to Comment No. 7-1

The LCWD and USFWS Stipulated Agreement and the associated Mitigation, Monitoring, and Management Plan are described in Chapter 1.4.2.1. Key components of the agreement have been summarized and added to this section as a bulleted list. The Kane Springs Valley Groundwater Development project would be constructed and operated in accordance with the stipulated agreement, and monitoring plan required and to be approved by the Nevada State Engineer.

Water Resources

Comment No. 7.2

Chapter 3.3, page 3-10, third paragraph. The Region of Influence for water resources needs to include the Muddy River Springs basin, since the MMM Plan identifies specific Action Criteria in that area.

Response to Comment No. 7-2

The text has been clarified (Section 3.3, page 3-10) so the reader understands that the Muddy River Springs area is within the Region of Influence. The basin is down gradient from the Proposed Action, and any indirect impacts from the construction and operation of the Kane Springs Valley Groundwater Development Project would be subject to stipulations outlined in the LCWD/USFWS Mitigation, Monitoring, and Management Plan.

Comment No. 7.3

Chapter 3.3.3.2, page 3-21, first bullet on page. The White River Flow System does not act as a single, continuous aquifer. There are numerous faults across the area, which act to either limit or enhance groundwater movement through the carbonate-rock aquifer.

Comment No. 7.4

Chapter 3.3.3.3.1, page 3-22, last paragraph on page. This discussion only describes groundwater recharge and discharge estimates from the CH2MHILL 2006 report. Other water budget estimates developed by different researchers should also be described, so that the discussion provides an accurate representation of existing available information. In Ruling 5712, the Nevada State Engineer did not accept the CH2MHILL 2006 recharge and discharge estimates, and provided alternative estimates which should be stated.

Comment No. 7.5

Chapter 3.3.3.4, page 3-25. Table 3-4 only provides estimates from the CH2MHILL 2006 analysis. As stated above, different values developed by other researchers should also be represented.

Water Rights

Comment No. 7.6

Chapter 1.4.2.1, page 1-6, third paragraph. The discussion should also state that the 1,000 acre-feet per year (afy) water rights granted in Kane Springs Valley by the Nevada State Engineer under Ruling 5712 were permitted after consideration of senior appropriated rights in down-gradient basins.

Comment No. 7.7

Page 3-29, Table 3-6 and page 4-59, Table 4-7.

1) Nevada State Engineer did not list perennial yield for all the identified basins in Ruling 5712. The source of this data should be explained, and ranges provided where there is not a single definitive source.

Comment No. 7.8

2) The water rights permitted column contains inaccuracies and should be checked. In Nevada State Engineer Order 1169, 16,300 afy was listed as permitted in Coyote Spring Valley and 14,756 afy as permitted in the Muddy River Springs (Upper Moapa Valley) basin.

Comment No. 7.9

3) The citation for the third footnote is missing.

Comment No. 7.10

4) The 80,051,543 afy listed as water rights pending for Delamar Valley should be verified and explained.

Comment No. 7.11

Page 3-29, Tables 3-6 and page 4-59, Table 4-7. The pending water right applications listed in these tables do not necessarily represent reasonable and foreseeable developments, and could be misconstrued. As described in more detail below, under Cumulative Analysis comments, the total quantity of these applications are not included in the DEIS analysis. Either the column should be removed, or substantial additional explanation provided regarding the status of each of the individual water right applications in those basins, and reasonably foreseeable developments separately identified.

Response to Comment No. 7-3

The statement in Chapter 3.3.3.2, page 3-21 is a direct citation from the USGS publication No. 1409-C, and subsequent Desert Research Institute publication No. 411169. This issue was also addressed in the hearings before the Nevada State Engineer (Appendix B of the FEIS).

Response to Comment No. 7-4

This section describes local hydrogeology in Kane Springs Valley and the CH2MHILL study is the only local site-specific study the BLM is aware of in the Kane Springs Valley Hydrographic Basin. The results of regional studies are described in the groundwater occurrence section (3.3.3.2) of the FEIS. The NSE discounted some of the CH2MHill recent studies in favor of the older studies conducted by the USGS (1971) and Eakin (1966).

Response to Comment No. 7-5

See response to Comment No. 7.4

Response to Comment No. 7-6

Findings of the Nevada State Engineer in Ruling 5712 have been summarized in Chapter 3.4 and Chapter 4.3. The process the NSE uses to allocate groundwater resources within the State of Nevada is not germane to BLM's decision to grant or deny a right of way application.

Response to Comment No. 7-7

Table 3-6 has been revised. Perennial yields came from Nevada Water Facts – Perennial Yield and Committed Resources Details NDWR 1992. The footnote was clarified.

Response to Comment No. 7-8

Tables 3-6 and 4-7 have been revised. Discrepancies resulted from reporting diversion rates (and conversions from cubic feet per second to acre feet per year) in order to stay consistent with amounts reported for applications that are still pending.

Response to Comment No. 7-9

Citation has been added to Table 3-6 and 4-7. The citation is NDWR (2007) Water Rights Database web page which can be found at http://water.nv.gov/water

Response to Comment No. 7-10

Table 3-6 has been revised. However, Delamar Valley does have 4 pending applications (69881-69884) filed in 2003 for large diversion rates for municipal and power use.

Response to Comment No. 7-11

Tables 3-6 and 4-7 have been revised. For clarification, totals were removed from the table.

Cumulative Analysis

Comment No. 7.12

Page 4-52, Table 4-6. In the Project column, the timing for the Coyote Spring Well and Moapa Transmission System project is incorrect. The Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were issued June 22, 2007.

Response to Comment No. 7-12
Correction has been made in Table 4-6 of this Final EIS.

Comment No. 7.13

Chapter 4.20.3.3.5, page 4-55.

1) The last sentence of the first paragraph should be updated to indicate that the Final EA and FONSI have been issued. Construction of this project is anticipated to start in fall of 2007.

Response to Comment No. 7-13
Correction has been made in section 4.20.3.3.5 of this Final EIS.

Comment No. 7.14

2) The first sentence of the second paragraph is incorrect. The Coyote Spring project will develop existing permitted water rights, and is not subject to Order 1169. Order 1169 pertains to pending groundwater applications, which would be developed under other projects.

Response to Comment No. 7-14
Correction has been made in section 4.20.3.3.5 of this Final EIS.

Comment No. 7.15

Chapter 4.20.3.3.9, page 4-57.

1) In the first paragraph, the description of the proposed facilities for the Clark, Lincoln and White Pine Counties Groundwater Development Project should be updated to indicate that they include 327 miles of pipeline, 5 pumping stations, 6 regulating tanks, a buried storage reservoir, a water treatment facility, 14 groundwater production wells, 349 miles of overhead power lines, 8 substations, and 4 hydroturbine energy recovery facilities (SNWA Plan of Development, July 2007).

Response to Comment No. 7-15
Correction has been made in section 4.20.3.3.9 of this Final EIS.

Comment No. 7.16

2) In the second paragraph, the first sentence should be revised to: "The proposed facilities would develop groundwater in the following valleys..." The second sentence should be revised to: "SNWA holds water rights and applications for approximately 167,000 afy..."

Response to Comment No. 7-16
Correction has been made in section 4.20.3.3.9 of this Final EIS.

Comment No. 7.17

3) The third paragraph provides an extensive discussion of the SNWA groundwater rights in Spring Valley recently issued by the Nevada State Engineer. If the intent of this discussion is to identify the quantity of SNWA's existing rights in Spring Valley, the discussion should also include the groundwater rights purchased by SNWA with property in Spring Valley. However, it does not appear that specific Spring Valley water rights are pertinent to the cumulative impact analysis for Kane Springs, therefore this entire discussion may not be necessary.

Response to Comment No. 7-17
The discussion regarding the Nevada State Engineers ruling on water rights in Spring Valley has been modified (section 4.20.3.3.9). Allocation of water rights within the Spring Valley Hydrographic Basin is not germane to BLM's decision to approve or deny the LCWD's right of way application in Kane Springs Valley.

Comment No. 7.18

Page 4-59, Table 4-7. As mentioned under the Water Rights comments above, the listing of all pending water right applications, is not appropriate for the cumulative analysis. Some of these water rights applications have been held for an extended time period, no State Engineer action has been requested, nor have formal development projects been proposed. Since only a portion of the pending application quantities were included in the cumulative impact analysis, listing all of them without additional explanation could be

Response to Comment No. 7-18
The column has been removed in Table 4-7.

Comment No. 7.18 (Cont.)

misinterpreted. Only pending water right applications considered reasonably foreseeable and evaluated in this cumulative analysis should be listed.

Comment No. 7.19

Chapter 4.20.4.2, page 4-60, fifth paragraph. In addition to Spring and Snake Valleys, the Clark, Lincoln, and White Pine Counties Groundwater Development Project also includes water right applications in Coyote Spring, Delamar, Dry Lake, and Cave Valleys. These valleys are within the same groundwater flow system as Kane Springs Valley and the Muddy River Springs basin, and any water rights granted by the State Engineer pursuant to SNWA's pending groundwater applications would be senior in priority to both the 1,000 afy granted under Ruling 5712 and any additional water rights granted in Kane Springs Valley.[1] Consideration of the location and senior status of SNWA's pending applications within the same flow system should be mentioned in this cumulative analysis.

Response to Comment No. 7-19

A summary of the findings of the Nevada State Engineer in Ruling 5712 have been added to Chapter 3.3.3.3.1. The process the NSE uses to allocate groundwater resources within the State of Nevada is not germane to BLM's decision to grant or deny a right of way.

Comment No. 7.20

Chapter 4.20.4.2, page 4-61, second, third, and fourth paragraphs. The cumulative impact discussion should also mention that the trigger range commitments for the Proposed Action under the LCWD and USFWS Stipulation Agreement would result in groundwater pumping under the Kane Springs Project being completely shut down before trigger levels for action under the Coyote Spring Memorandum of Agreement are reached.

Response to Comment No. 7-20

The decisions to require reduction or cessation of pumping under the LCWD and USFWS Stipulation agreement and/or the Coyote Springs MOA would be made by the Nevada State Engineer, the timing and sequence of which are presently not known.

Comment No. 7.21

Chapter 4.20.4.2, page 4-62, first non-bulleted paragraph. The listed rulings and agreements would not necessarily prevent any cumulative impacts from occurring. Under those agreements, in-stream flow, levels may decrease to the agreed-upon trigger ranges and levels. These decreases in flow, may not result in significant impacts, but it seems inappropriate to imply that there would not be any impacts.

Response to Comment No. 7-21

Comment noted.

We appreciate the opportunity to provide these comments. If you have any questions, please contact me at (702) 258-3107 or Lisa Luptowitz at (702) 862-3789.

Sincerely,

Kay Brothers

Kay Brothers
Deputy General Manager
Engineering/Operations

KB:LL:df

cc: Lisa Luptowitz, Senior Environmental Planner, SNWA

[1] See NRS 534.080(3) "The date of priority of all appropriations of water from an underground source, mentioned in this section, is the date when application is made in proper form and filed in the office of the State Engineer[.]".

"Simeon Herskovits" <simeon@communityandenvironment.net>

08/21/2007 12:29 AM

To nvgwprojects@blm.gov, Penny_Woods@blm.gov

cc sblynn@sbcglobal.net, rosenreno@sbcglobal.net

bcc

Subject comments on Kane Springs DEIS

Dear Ms. Woods:

Attached are comments on the draft Environmental Impact Statement for teh Kane Springs Valley Groundwater Development Project. In addition to the main comment document, please note that three additional documents are being submitted as part of those comments. Those three documents comprise Dr. Myers's hydrogeology report and Dr. Deacon's manuscript article on potential biological impacts (with the article's figures as a separate document).

Thank you for attention to these materials.

Sincerely,

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8-20-07.Kane Springs DEIS Comments 2.doc 8-3-07.Myers review of Kane Springs DEIS.doc

7-30-07.Deacon manuscript final no figs.doc 7-30-07.Deacon manuscript Figures.ppt

SENT VIA E-MAIL

August 20, 2007

Penny Woods
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Bureau of Land Management
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Penny_Woods@blm.gov

Re: Comments on the BLM's Kane Springs Groundwater Development Project Draft Environmental Impact Statement

Dear Ms. Woods:

Thank you for providing this opportunity to provide comments on the Bureau of Land Management's (BLM's) draft environmental impact statement (DEIS) for the Kane Springs Groundwater Development Project (hereinafter "project," "proposed action," or "Kane Springs Project").

These scoping comments are submitted by Advocates for Community and Environment on behalf of the Great Basin Water Network ("GBWN") and Defenders of Wildlife ("DOW") (collectively the "Commenters"). Additional comments may also be submitted separately by members of these organizations, their employees/officers, and other interested citizens associated with these organizations. These comments incorporate by reference all such comments, as well as the comments of the Toiyabe Chapter of the Sierra Club, Dr. Jim Deacon, and Dr. Tom Myers.

Comment No. 8-1-1

The Commenters request that these comments, and all attachments be included as part of the administrative record. The Commenters further request that all documents, articles, and/or reports cited in these comments and attached expert testimony be included as part of the administrative record of this action. See County of Suffolk v. Secretary of Interior, 562 F.2d 1368, 1384, n.9 (2d Cir. 1977) (addressing scope of NEPA administrative record), cert. denied, 437 U.S. 1064 (1978); Silva v. Lynn, 482 F.2d 1282 (1st Cir. 1973) (same); see also Thompson v. United States Dep't of Labor, 885 F.2d 551, 555 (9th Cir. 1989) (administrative record consists of all documents and materials directly or indirectly considered by agency and includes evidence contrary to agency's position).

As explained in detail below, the Project is premised on unsustainable groundwater mining, and as such poses a serious threat to the groundwater system underlying a substantial

Response to Comment No. 8-1-1

As described in Chapter 1.2 – Purpose and Need, the purpose of LCWD's application to the BLM is to construct and operate infrastructure to convey groundwater resources permitted by the Nevada State Engineer across federal lands managed by the BLM. The CSI development in Lincoln and Clark County are separate actions from the Proposed Action. CSI development in both counties would occur in the absence of the Proposed Action. The NSE is the governing entity that has the authority to approve and control the amount of groundwater pumped from basins in Nevada. The CSI development must be designed to incorporate water efficiencies and conservation measures to support their proposed buildout. These measures are described in the CSI General Improvements District Water Plan. Also see response to comment 6-6.

portion of the carbonate aquifer province and the dependent environment. Among the harms likely to be caused by the Project are long-term, catastrophic depletion of the aquifer that would take many millennia to remedy. By substantially drawing down the local and regional aquifer systems, the Project also threatens to dry out regional springs that support a host of endemic species, including species listed under the Endangered Species Act. The project also poses a significant risk of creating a substantial area of denuded, dried out sediment with considerable potential to generate harmful dust emissions comparable to those produced by the drying out of the Owens Valley, which ranks as one of the Nation's most conspicuous environmental disasters. In addition, the use of such a significant quantity of ground water on the surface of a great area of Coyote Springs Valley promises to attract ravens and other birds of prey that will predate on fragile desert tortoise population in nearby habitat areas. These are only some of the distrubing potential environmental impacts from the Project, impacts that in practical terms will be permanent and very expensive to even attempt to mitigate.

Comment No. 8-1-2

The Draft Environmental Impact Statement (DEIS) does not adequately address these and other serious problems with the Project. Indeed the DEIS is woefully inadequate under NEPA. Among its most glaring deficiencies, the DEIS is based on a patently deficient description of the Project and the physical conditions and environmental resources in its vicinity, a grossly inadequate assessment of the purpose and need for the Project, and a failure to examine the Project's feasibility and likely adverse environmental impacts. In all these regards, the DEIS fails to comply with NEPA.

Response to Comment No. 8-1-2

Direct impacts on these resources are discussed in Sections 4.3.1.1, 4.3.1.2, 4.3.1.3, 4.3.1.4, 4.3.1.5, 4.3.1.6, 4.4.1, 4.5.1, 4.5.1.1, and 4.5.1.2.

The Legal Requirements of the National Environmental Policy Act:

"Section 101 of NEPA declares a broad national commitment to protecting and promoting environmental quality." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 348 (1989), citing 83 Stat. 852, 42 U.S.C. § 4331. "The sweeping policy goals announced in § 101 of NEPA are . . . realized through a set of 'action-forcing' procedures that require that agencies take a "hard look' at environmental consequences.'" Id. at 350, citing Kleppe v. Sierra Club, 427 U.S. 390, 410 n.21 (1976). NEPA's main "action-forcing" procedure comes in the form an environmental impact statement ("EIS"), a detailed statement on environmental impacts that must be prepared before an agency undertakes any "major Federal action[] significantly affecting the quality of the human environment." NEPA § 102(2)(C), 42 U.S.C. § 4332(2)(C).

Thus, NEPA "ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). See also Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, 435 U.S. 519, 553 (1978) ("NEPA places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action"). "These procedural provisions of NEPA 'are designed to see that all federal agencies do in fact exercise the substantive discretion given them. These provisions are not highly flexible. Indeed, they establish a strict standard of compliance.'" Sierra Club v. Watkins, 808 F. Supp. 852, 859 (D.D.C. 1991), quoting Calvert Cliffs' Coordinating Comm., Inc. v. United States Atomic Energy Comm'n, 449 F.2d 1109, 1112

(D.C. Cir. 1971).

The Council on Environmental Quality ("CEQ") has promulgated regulations implementing NEPA that are binding on all federal agencies. 40 C.F.R. § 1500.3; Robertson v. Methow Valley Citizens Council, 490 U.S. at 354.

The DEIS Fails to Accurately Identify or Adequately Evaluate the Purpose and Need for the Project:

As described below, the Assessment of purpose and need that underlies the DEIS is inadequate and characterized by omissions and inconsistencies.

Conservation Measures

To begin with, the DEIS does not provide sufficient specificity regarding what conservation measures have been, or reasonably can be expected to be, implemented in Lincoln and Clark Counties. Without this information it is not possible to assess the reasonableness of the assumed future demand on which the Kane Springs Valley Groundwater Development Project is premised.

Comment No. 8-1-3

Throughout the discussion of need and purpose, the DEIS betrays a presumption in favor of mining groundwater from Kane Springs Valley for proposed unsustainable growth in Coyote Springs Valley, rather than examining other, more sustainable, potential water supplies, including increased water conservation and recycling in both Lincoln and Clark Counties.

Response to Comment No. 8-1-3

The CSI development is a separate action from the Proposed Action. The CSI Development would occur in the absence of the Proposed Action. However, in the interest of understanding reasonable, foreseeable future actions in the region of influence, the Final EIS contains an expanded discussion of CSI's proposed actions in Clark and Lincoln County. This information has been added to Chapter 4.20.3.3.2. Cumulative socioeconomic impacts are discussed in section 4.20.4.8.

The bias betrayed in this unbalanced consideration is also evident in the DEIS's failure to acknowledge that increased conservation measures would protect against overdraft of groundwater basins.

Because the BLM passively accepts the Project proponents' assertions concerning future water demand, the DEIS provides the public and the ultimate decision-makers with no basis for assessing the adequacy of the consideration given to reasonably available additional conservation measures.

Comment No. 8-1-4

Water Recycling and Groundwater Recovery Programs:

The purpose and needs analysis also fails to adequately describe or address the opportunities to meet anticipated water demand through water recycling and groundwater recovery programs. Because this potential additional water supply is not considered in the purpose and need analysis underlying the DEIS, neither the Agencies nor the public can make an informed decision regarding the actual need for the Project.

Response to Comment No. 8-1-4

Cumulative impacts are discussed for all resources in Chapter 4.20.4. The geographic scope for the analysis is referred to as the cumulative resource analysis area and varies by resource. The timeframe for the cumulative impact analysis encompasses past and present activities in the areas described above, and future activities that may extend up to 20 years in the future and is described in Chapter 4.20.2. Other actions affecting resources, ecosystems, and/or human communities of concern are described in Section 4.20.3 Cumulative Projects Considered.

The DEIS Fails to Adequately Describe the Project and the Physical Conditions and Environmental Resources in its Vicinity -- Deficient Description of Hydrogeologic Conditions and Analysis of Potential Hydrogeologic Impacts:

Comment No. 8-1-5

As detailed in the report of Dr. Tom Myers (attached hereto as Exhibit A), the DEIS is grossly deficient in many regards concerning the hydrogeology of Kane Springs Valley and of the proposed project. That report and the criticisms contained therein are herby incorporated by reference into these comments.

Response to Comment No. 8-1-5

As required by Nevada State Engineer ruling 1169, data are currently being collected for all wells in Coyote Springs Valley with the results posted on the internet. For Kane Springs, the only available data is from the test wells KPW-1 and KMW-1. Geochemistry data for the eight wells has been added to section 3.3.3.3.1 of this FEIS.

Additional deficiencies of the DEIS are listed below. In light of these deficiencies under NEPA, we believe that the only appropriate action for the BLM to take is to correct its deficient analysis and issue a new DEIS for public comment.

Comment No. 8-1-6

(1) Direct Impacts. The DEIS has failed to carefully analyze the direct impacts of the Project. This includes analyzing the impacts of both the construction and long-term operation of the wells, pipelines, electrical supply lines and ancillary facilities. Of particular concern are the direct impacts of the proposed action on eastern Nevada's aquifers (valley fill and carbonate), springs, seeps, wetlands, and wet meadows, water dependant vegetation, wildlife populations and habitat (including threatened and endangered species), and existing water rights (including vested rights). The DEIS also fails to adequately analyze the impacts of the proposed action on the neighboring Area of Critical Environmental Concern (ACEC), the Pahranagat National Wildlife Refuge, Desert National Wildlife Range, and the Arrow Canyon Wilderness.

Response to Comment No. 8-1-6

A reasonable range of alternatives is presented in Chapter 2.0 of this FEIS. Chapter 2.

Comment No. 8-1-7

(2) Indirect Impacts. The DEIS fails to adequately analyze the indirect effects of the Project. Indirect effects are effects that are caused by the action but occur later in time or are further removed in distance. See 40 C.F.R. § 1508 (b). Indirect effects "may include growth inducing effects or other effects related to induced changes in pattern of land use; population density or growth rate; and related effects on air, water, and other natural resources." Id. Here, the indirect effects of the Kane Springs Project include, but are not limited to, the future growth and development of the Coyote Springs Valley – the stated "purpose" of the project – and the indirect effects on the region's human and wildlife communities that will result from the proposed pumping of the aquifer. Unfortunately, the DEIS fails to take a meaningful, let alone the required "hard," look at these impacts.

Response to Comment No. 8-1-7

Comment Noted.

Comment No. 8-1-8

(3) Cumulative Impacts. The DEIS does not contain the required hard look at the cumulative impacts of the proposed action. Cumulative impacts are "the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. Cumulative impacts can result from "individually minor but collectively significant actions taking place over a period of time. Id.

The DEIS does not properly analyze the cumulative effects of the Project because it does not: (1) identify the significant cumulative effects issues associated with the proposed action; (2) establish the proper geographic scope for the analysis; (3) establish an appropriate time frame for the analysis; or (4) identify other actions affecting the resources, ecosystems, and/or human communities of concern. Thus, the DEIS is deficient in all regards concerning cumulative effects.

Response to Comment No. 8-1-8

Environmental resource data was collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives. The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. There is, however, a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved. Areas of uncertainty associated the Proposed Action are described in the Incomplete and Unavailable Information section located at the beginning of Chapter 4.

In this case, establishing the proper geographic scope or boundary for a cumulative impacts analysis is extremely important because the proposed action will have direct, indirect, and an "additive" affect on resources *beyond the immediate* area. To determine the appropriate geographic boundaries for a cumulative effects analysis, therefore, the BLM's DEIS should first have: (1) determined the area and resources (i.e., the aquifers) that will be affected by their proposed action (the "project impact zone"); (2) made a list of resources within that area or zone that could be affected by the proposed action; and (3) determined the geographic areas occupied by those resources outside the immediate area or project impact zone. The largest of these areas would be the appropriate area for the analysis of cumulative effects. By way of example, for resident or migratory wildlife, the appropriate geographic area for the cumulative impacts analysis will be the "species habitat" or "breeding grounds, migration route, wintering areas, or total range of affected population units." see e.g., NRDC. v. Hodel, 865 F.2d 288, 297 (D.C. Cir. 1988) (agency violated NEPA by failing to consider the synergistic effect of simultaneous development on migratory whales).

Indeed, because the Kane Springs Project will directly impact a vast aquifer system (valley fill and carbonate), the scope of the cumulative impacts analysis in the DEIS must encompass the entire aquifer system. Some of Nevada's aquifers are connected among basins. As such, the development of water resources in one basin may affect water levels in or discharges to other basins. It therefore is imperative that the scope of the BLM's cumulative impacts analysis extend beyond the immediate Kane Springs Valley, transcend State boundaries, and include the entire aquifer system (this includes the States of Idaho, California, and Utah). Unfortunately, however, the DEIS fails utterly to engage in this broad analysis.

Another important aspect of a cumulative impacts analysis that the BLM is required to engage in is an assessment of other past, present, and reasonably foreseeable actions affecting the resources, ecosystems, and/or human communities of concern. According to the CEQ, the "most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time." The requirement to consider cumulative impacts, therefore, is designed to avoid the "combination of individually minor" effects situation – to avoid the "tyranny of small decisions" or "death by a thousand cuts" scenario. See e.g., Grand Canyon Trust v. FAA, 290 F.3d 339, 346 (D.C. Cir. 2002).

The DEIS therefore should have taken into account and analyzed a number of state, private, and other federal actions as well as natural occurrences or events that have taken place (historic and current pumping), are taking place, or are proposed to take place that will similarly impact the region's aquifers, wildlife populations and habitat, and human communities (i.e., existing rights, domestic wells). Individually, each groundwater pumping activity – though serious – may not rise to the level of posing a significant risk to the aquifer. Collectively, however, the impacts of all of these and other activities – whether conducted by private individuals, state agencies, or other federal agencies – may be significant and must be analyzed. See e.g., Grand Canyon Trust, 290 F.3d at 346 (discussing collective impacts to Zion National

Comment No. 8-1-8 (Cont.)

Park); NRDC v. Hodel, 865 F.2d 288 (D.C. Cir. 1988) (discussing collective impacts to migratory whales). As the D.C. Circuit Court noted, federal agencies must "give a realistic evaluation of the total impacts [of the action] and cannot isolate the proposed project, viewing it in a vacuum." Grand Canyon Trust, 290 F.3d at 342. Even "a slight increase in adverse conditions . . . may sometimes threaten harm that is significant. One more factory . . . may represent the straw that breaks the back of the environmental camel." 290 F.3d at 343 (quoting Hanly v. Kleindienst, 471 F.2d 823 (2nd Cir. 1972)).

Under NEPA, an agency must honestly address the various uncertainties surrounding the scientific evidence upon which it relies in its environmental evaluations. The agency has a duty to respond to credible opposing points of view, and it may not ignore reputable scientific opinion. See, e.g., Seattle Audubon Soc'y v. Espy, 998 F.2d 699, 704 (9th Cir. 1993); Public Service Co. v. Andrus, 825 F. Supp. 1483, 1496-99 (D. Idaho 1993); see also Sierra Club v. Watkins, 808 F. Supp. 852, 864-69 (D.D.C. 1991). An agency's NEPA analysis must expose scientific uncertainty regarding the risk of a proposed action and inform decisionmakers of the full range of responsible scientific opinion on the environmental effects of the proposed action. Friends of the Earth v. Hall, 693 F.Supp. 904, 926, 934 (W.D. Wash 1988). Also, federal agencies are responsible for overseeing and ensuring the accuracy of environmental impact statements produced by contractors. 40 C.F.R. § 1506.5(c).

In this regard, too, the DEIS is inadequate on its face and must be redone.

Comment No. 8-1-9

Additional potential significant impacts of the Kane Springs Project that the DEIS fails to adequately address are impacts on air quality through the creation of conditions that will increase the likelihood of serious dust emissions in the affected area and impacts to wildlife species in the affected area, including those listed under the ESA and presently protected in wildlife refuges and management areas.

Response to Comment No. 8-1-9

Each of the projects mentioned are separate and distinct with their own unique issues and timelines. Each represents a discreet hydrographic basin or set of basins for which the allocation of water rights is with the purview of the Nevada State Engineer.

(4) Baseline. The BLM's DEIS will need to establish the proper baseline upon which to base its impacts analyses and conduct the requisite "trends analysis," i.e., an assessment of the environmental impacts of all activities affecting the various resources over an extended period of time. Only by properly defining the baseline and engaging in a trends analysis can the BLM get a sense of the changes that have occurred overtime. At a minimum, baseline data on water rights and claims (vested, recorded, and applications), historic and current water uses, locations of all springs and seeps (on both private and public land), locations of all wet meadows and wetlands, locations of water-dependant flora and fauna, aquifer recharge rates, and information on the connectivity between the alluvial groundwater and carbonate system throughout the affected region is needed in order to properly analyze the impacts (direct, indirect, and cumulative) of the proposed action.

(5) Alternatives. The BLM's DEIS will need to consider a reasonable range of alternatives. Under NEPA, federal agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E); 40 C.F.R.

§ 1508.9(b). The discussion of reasonable alternatives section is the "heart" of any environmental analysis under NEPA. 40 C.F.R. § 1502.14. In order to comply with this mandate, the BLM's DEIS will need to properly define the "purpose and need" of the action. If the "purpose and need" of the action is too narrowly defined, then the range of alternatives considered will likewise be too narrow in scope. At a minimum, the DEIS will need to explore different levels of pumping, alternative sources of water, piping from different sources, desalinization, different combinations of pumping among valley fill and carbonate wells, various mitigation measures, various levels of development in the Coyote Springs valley, and a water conservation alternative.

(6) Meaningful Public Comment. The goal of NEPA, and the very purpose of preparing a DEIS is to "provide a full and fair discussion of significant environmental impacts [of a proposed action]" and to "inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. §1502.1. With this mandate in mind, and in order to enable meaningful public comment, the BLM's DEIS for the Kane Springs project will need to be well organized, easy to read and understand, and include proper references and citations to all relevant scientific studies and data. Given the technical nature of the DEIS and the need for careful public review and analysis, the DEIS's public comment period should also be extended to a minimum of 120 days. The BLM should also disclose to the public, as soon as possible, the hydrological and biological data and assumptions underlying any models that will be used for the DEIS. The BLM's DEIS must also include complete and accurate information. In this respect, it is extremely important for the BLM to collect the necessary data on the aquifers, springs, seeps, and wetlands, and existing rights (especially vested rights) before preparing the DEIS. It is equally important for the BLM to identify the precise location and dates of all well applications filed, the amount of water to be withdrawn, and the status of any other water rights and applications in the region.

(7) Best Scientific Information. All agencies, including the BLM "shall insure the professional integrity, including scientific integrity, of the discussions and analyses in [NEPA documents.]" 40 C.F.R. §1502.24. Pursuant to NEPA, information included in a DEIS "must be of high quality." 40 C.F.R. § 1500.1 (b). Accurate "scientific analysis [is] essential to implementing NEPA." Id. While a DEIS may not be expected to reference or rely on every study or opinion, the state of scientific knowledge on a particular subject must be fairly represented in a balanced manner. Morever, a DEIS must contain a reasoned analysis in response to conflicting data or opinions on environmental issues.

The DEIS for the Kane Springs Project does not present and is not based upon the required high quality scientific data and analysis required by NEPA. This failure is apparent by comparing the conclusory discussion contained in the DEIS with the authoritative information and analysis contained in the report of Dr. Tom Myers on hydrogeologic aspects of the Project (attached hereto as Exhibit A) and the manuscript article of Dr. Jim Deacon on the biological implications of ground water development proposals including the Kane Springs Project (Attached hereto as Exhibit B). In order to adequately analyze the direct, indirect, and cumulative impacts of the proposed action, the BLM will need to review and collect more scientific data. At a minimum, the BLM needs to prepare detailed potentiometric surface maps for the valley fill and carbonate aquifers, complete sufficient pump tests (with monitoring) to detail the variability in hydraulic conductivity across the basins, and complete pump tests for transient calibration of a groundwater model. In addition, the BLM needs to prepare a detailed groundwater model that includes all of the basins in the carbonate province and the overlying valley fill aquifers. The BLM should also prepare a monitoring and mitigation plan and carefully review and consult all other available (or soon be available) studies on the aquifer system and the impacts of groundwater pumping on the area's natural resources.

(8) Comprehensive EIS. The deficiencies of the DEIS plainly bear out the need for the BLM to prepare one comprehensive or programmatic EIS for all groundwater development projects in the region. Pursuant to CEQ's NEPA regulations, actions that: (1) are closely related, i.e., are interdependent parts of a larger action and depend on the larger action for their justification; or (2) are cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts; or (3) are similar actions that have similarities that provide a basis for evaluating their environmental consequences together, such as common timing and geography, need to be considered in one EIS. See 40 C.F.R. § 1508.25.

Here, there are a number of individual projects that should be considered in one, single EIS. These projects include, but are not limited to: (1) the Tule Desert project (also known as the "Lincoln County Land Act project"); (2) the Three Lakes Tikaboo project; (3) the Virgin/Muddy River surface water development project; (4) the Lake Mead pipeline EIS; (5) the Coyote Springs development project; and (6) the Southern Nevada Water Authority's Clark, Lincoln, and White Pine Counties groundwater development project.

Without question, all of these projects are closely related as they involve the same impacts to the same resource (the aquifer system) and are part of a larger, programmatic plan to develop interconnected "in-state" water resources. The projects are also actions, which when viewed with other proposed actions have cumulatively significant impacts on the aquifer, human communities, and wildlife populations and habitat in the region. These projects also qualify as "similar actions" that have similarities that provide a basis for evaluating their environmental consequences together, such as common timing and geography. These projects therefore belong in one, programmatic EIS.

In fact, preparing a single EIS is the only way the BLM can explore a reasonable range of alternatives with varying degrees of groundwater pumping, alternate sources of water, conservation measures, various locations for proposed wells, and different combinations of pumping among the valley fill and carbonate wells throughout the region.

In closing, thank you for providing this opportunity to submit scoping comments on the BLM's Kane Springs project. We sincerely appreciate the opportunity to participate in this and other important decisions affecting public resources in Nevada. The significance of these interconnected water development projects in terms of the impacts to human communities in rural Nevada and Utah and the survival of unique ecosystems and endemic species in the Great Basin region cannot be overstated.

We hope you find these comments to be helpful, informative, and useful in your efforts to comply with the NEPA and other substantive statutes. If you have any questions or comments, or wish to discuss the issues raised in these comments in greater detail, please do not hesitate to contact me or the GBWN and DOW representatives listed below.

Sincerely,

//s//

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On *Behalf* of:

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COMMENTS OF GREAT BASIN WATER NETWORK AND DEFENDERS OF WILDLIFE ON THE DRAFT EIS FOR THE KANE SPRINGS GROUNDWATER DEVELOPMENT PROJECT

EXHIBIT A

August 2, 2007

Technical Memorandum
To: Great Basin Water Network
From: Tom Myers, PhD, Hydrologic Consultant
Re: Review of the Kane Springs DEIS

This DEIS is based on Coyote Springs Development ultimately receiving 5000 af/y from the Nevada State Engineer. The project has three phases, with the first implementing the existing 1000 af/y grant. The remainder of the project depends on the State Engineer effectively reversing his Kane Springs ruling (Nevada State Engineer Ruling 5712 (Kane Springs Ruling)) and granting more water.

The DEIS indicates that Lincoln County has applied for additional water rights from Kane Springs beyond that which was considered in the Kane Springs ruling (DEIS, page 4-6). The DEIS claims that the pumping will not affect Muddy Springs, but does recite some modeling results done by others showing that the cumulative effects will be devastating. The DEIS also depends in large part for its hydrologic conditions on findings by consultants work which the State Engineer rejected in part or in whole in the Kane Springs ruling, as will be described below.

This technical memorandum reviews the hydrogeology in the Kane Springs DEIS. It finds that the DEIS inappropriately used recharge and interbasin flow estimates that had previously been rejected by the Nevada State Engineer, does not do a numerical model of the impacts of the flow, and inappropriately uses the Theis method to predict the extent of drawdown from six wells. The methods used will lead to an estimate of drawdown that is much less than will occur if this project is built.

Faulty Science in the DEIS

Comment No. 8-2-1

The BLM in the Water Resources section of the DEIS presented numerous flow estimates and suppositions that are in error and that have been rejected by the Nevada State Engineer. One example is the estimate for flow into, out of, and recharge to Kane Springs Valley (DEIS, page 3-22). There are at least three problem areas.

First, the BLM references CH2MHILL's estimate of that there is 13,000 af/y of regional groundwater flow into Kane Springs Valley. The estimate is based on a gradient determined from wells far apart without any evidence of there being a hydraulic connection between them. The State Engineer found "the Applicants' inflow analysis [to be] overly interpretive and without sufficient supporting evidence" (Kane Springs ruling,

Response to Comment No. 8-2-1

The NSE found that "the applicants' interpretation of ground-water movement in the Kane Springs Valley from northeast to southwest and into Coyote Spring Valley, preferentially along the Kane Springs Wash Fault zone, is generally consistent with the available data." A summary of the NSE ruling has been added to section 3.3.3.3.1. The BLM agrees that the NSE found fault with the calculations and accordingly only appropriated 1,000 afy. This has been clarified in the FEIS (in section 3.3 and 4.3).

Comment No. 8-2-1 (Cont.)

page 8). The flow would occur through a "relatively narrow zone at the corner of the basin" (Id.). The State Engineer also found that "sufficient data does not exist to substantiate or reliably estimate subsurface flows into the Kane springs Valley Hydrographic Basin and the Applicants' **inflow estimates are hereby discounted and not accepted.**" (Id., emphasis added). It is these discounted estimates that the BLM reports as fact in this DEIS.

Second, the BLM claims local recharge in Kane Springs Valley to "be on the order of 5000 AFY" (DEIS, page 3-22). In the Kane Springs ruling, the State Engineer specifically rejected the analyses supporting the project proponents estimate recharge range of 5000 to 14,000 af/y. The State Engineer used an analogue with the Death Valley flow system and suggested that groundwater recharge would range from 1 to 2% of total precipitation or from 1200 to 2800 af/y (Kane Springs ruling, page 14). The State Engineer states that his estimate is greater than the reconnaissance estimate of 500 af/y but also that his new estimate should not be considered definitive (Id.).

Third, the BLM reports that project proponents estimated discharge from Kane Springs into Coyote Spring Valley as equaling 16,000 af/y as though it is accepted (DEIS, page 3-22). It is not accepted; the Nevada State Engineer rejected all of the analysis used to reach these conclusions in his Kane Springs Ruling. "The State Engineer finds several irregularities and inconsistencies with the Applicants' analysis." (Kane Springs ruling, page 9). For one, the State Engineer rejected the applicants estimated gradient of 0.005 and instead determined the appropriate gradient was 0.0004.

In section 4, the BLM discusses the Nevada State Engineer's ruling and acknowledges that the Nevada State Engineer limited the permits to 1000 af/y – not the 5000 af/y sought by the applicant (and proponent of this right-of-way application). The BLM also acknowledges that it is the Nevada State Engineer who sets the perennial yield for a basin. But the BLM then repeats the CH2MHILL estimated recharge of 5000 af/y as though the BLM assumes that the Nevada State Engineer will change his mind. The BLM must realize that the BLM rejected the applicant's water rights applications **because** he rejected the 5000 af/y recharge estimate which the BLM is now using as the basic science supporting this DEIS.

The BLM has rejected the State Engineer's decision with respect to the science by accepting much of it for this DEIS. But, when considering the effects of the pumping on Muddy River Springs, it accepts the State Engineer's finding that there is not sufficient data to prove there would be an effect. This is discussed below in the section on Regional Springs.

Improper and Inappropriate Modeling

Comment No. 8-2-2

The DEIS described geologic conditions as being complex, with faults both limiting and enhancing flow. The conditions described are very heterogeneous. But the project does not include predictive numerical modeling, as it should. Rather the project utilizes standard Theis equations to predict the extent of drawdown to be expected; this method is

Response to Comment No. 8-2-1 (Cont.)

The CH2MHill study is the only local site-specific groundwater study that has been conducted in the Kane Springs Valley Hydrographic Basin. Regional findings are described in the groundwater occurrence section (3.3.3.2). New sections have been added to the FEIS Chapter 4 that address uncertainty: Assumptions for Analysis and Incomplete and Unavailable Information at the beginning of Chapter 4.

Response to Comment No. 8-2-2

In this section, BLM presented a local recharge data for Kane Springs Valley as reported by CH2MHill (2006). CH2MHill presented this data at the Nevada State Engineers hearing in April 2006. Following these hearings and review of both the older regional and the newly acquired data, the Nevada State Engineer permitted up to 1,000 AFY of groundwater from Kane Springs Valley (February 2007, Ruling 5712). As part of the ruling the State Engineer did not accept several of the recent results from the Applicant's studies cited in the above paragraphs and instead relied primarily on the older work of the State Engineer's Office (1971) and Eakin

Comment No. 8-2-2 (Cont.)

grossly inappropriate for the flows being considered herein as will be discussed below, especially when those flows could affect interbasin flow to downstream springs and water rights.

This author has reviewed many EISs in Nevada for many types of projects. These include many mine proposals that will dewater the groundwater to keep the pits dry. Some of these have proposed to pump at rates equivalent to or even less than proposed in the Kane Springs DEIS. NEPA analysis projected similar rates for the Rain mine, Ruby Hills and Round Mountain, and the hydrologic analysis of drawdown and future impacts was much greater for those projects than for this project.

One big difference between the mine projects and Kane Springs is that the mines are temporary: the pumping will cease within 5 to 15 years, and then a lake will form. The draw from groundwater will cease in a few decades. Kane Springs will in all likelihood pump in perpetuity, and the drawdown will expand in perpetuity, especially if the BLM's projected 5000 af/y is ever granted by the State Engineer and pumped. The drawdown will continue to expand especially because it exceeds by from 2 to 4 times the local recharge. Thus, the BLM in mine dewatering/pit lake analyses has required a far more stringent analysis than one for a project which will operate in perpetuity. The BLM should redo this analysis after the proponent has collected sufficient data to complete a groundwater flow model of the system.

Response to Comment No. 8-2-2 (Cont.)

(1964). Ruling 5712 findings and their ramifications are summarized in Sections 3.3.3.3.1. and 4.3.1.3. There is a level of uncertainty associated with this data which is further described in Incomplete and Unavailable Information section at the beginning of Chapter 4. The project proponent intends to satisfy the requirements of Ruling 5712 by pumping up to the appropriated limit. Following that and additional studies, it may reapply for more than the currently appropriated 1,000 af/y. However, this DEIS is for the pipeline right of way which is a viable project based on the NSE's appropriations of 1,000 af/y. Given the results of pumping of the initial 1,000 af/y and review of data from other existing wells to be monitored in the region, the applicant may seek NSE action on pending applications for groundwater beyond the 1,000 af/y already appropriated, up to 5,000 af/y total.

Theis Method Analysis

Comment No. 8-2-3

The DEIS used simple Theis analysis to estimate the drawdown caused by the proposed project. This analysis violated all of the assumptions for using the Theis method even though it attempted to explain how some of the assumptions were satisfied. The DEIS presents the assumptions on page 4-7. They are incorrect and are addressed in order as follows:

The method assumes the aquifer is confined. A confined aquifer is under pressure, such that a well developed in the aquifer would have a water level above the top of the aquifer. There is no indication that this is the case. In Kane Springs, the carbonate is apparently the highest aquifer, which means it would have a free water surface unless there is an aquitard overlying it and preventing groundwater flow flowing upward. The definition of confinement is not that the "sedimentary layer defined as the aquifer have other overlying sediments that restrict the inflow of water from a surficial aquifer" (DEIS page 4-7), although that is part of it.

The small amount of information in the DEIS about well KMW-1 suggests the aquifer is not pressurized. The well is 2000 feet deep and the screen length is 1025 feet, presumably over the bottom length of the well (DEIS page 3-22). If the water level is 992 and 997 feet bgs (Id.), the top of the screen corresponds with the water level. It is possible that individual fracture networks are under pressure, but this does not qualify as an unconfined aquifer. If Figure 3-4 in the DEIS is correct, the water level lies in the middle of the Ely Springs dolomite where it forms a free water surface; it is clearly has

Response to Comment No. 8-2-3

Please see response to comment 8-2-1.

Comment No. 8-2-3 (Cont.)

no confining layer and is unconfined. Using the Theis method for this analysis violates one of its key assumptions – that of a confined aquifer.

It is certainly incorrect to state: "[t]his assumption is clearly met in the current case of extraction from the deep carbonate aquifer, which is overlain by a surficial aquifer that is approximately 200 feet thick." (*Id.*). The water level was just shown to be at least 700 feet below the bottom of the basin fill, so there is no hydraulic connection. But, the BLM's assumption is that no inflow from the surface occurs. There is no data to support that supposition. In fact, if the basin fill aquifer is ephemerally saturated, it likely drains into fractures in the Laketown dolomite and seepage may reach the underlying carbonate aquifer. Unless the BLM obtains data to show that no water leaks from the surface to the aquifer, and without data to indicate the quartzite layer shown on Figure 3-4 is continuous, the BLM should not claim there is no connection and rely on this claim for its analysis.

The aquifer is most certainly not isotropic and homogeneous as claimed on page 4-7. These conditions are not met in a fracture system where secondary permeability provides most of the conductivity and by its nature the system is extremely horizontally anisotropic. The BLM acknowledges this in part by stating that the actual cone of depression may be oval, but then concludes that the method is reasonable.

One Theis method assumption not addressed by the BLM is that the method assumes the aquifer has infinite extent. This means there is an unlimited supply of water to be pumped from the well. The method's mathematics depends on the assumption that flow can occur from all directions without limit. The limited confines of a fracture system completely violate that assumption; the actual drawdown will be much higher because of the limited water source.

The BLM concludes that the method is acceptable because it knows too little about the system. "However, due to the unknown geometry of the Kane Springs Wash Fault system and the potential for further focusing by the Willow Spring Fault, it is believed that the Theis approach provides a reasonable method for estimating the maximum impacts (drawdown) prior to project development" (DEIS page 4-7). This argument can be summarized by saying that since we do not know much about the area, we feel justified in using this simplified analytic technique. The problem is that drawdown caused by pumping in the actual system will be much higher than calculated using the idealized conditions used by the BLM. The direction the drawdown cone extends from the well will not be circular; it will extend further in some directions.

The BLM also used a single well as a proxy for the multiple wells; this is incorrect in this situation because up to six wells would be spaced every mile along the west side of Kane Springs Valley in a line. BLM's proxy method may be accurate for a symmetric well field but it is most certainly not appropriate where the wells are spaced along a line which is longer than the valley is wide.

Comment No. 8-2-3 (Cont.)

BLM also used inappropriate parameters in the analysis. The storage coefficient of 10^{-4} is very high, especially for fractured carbonate rock. Faunt et al (2004) found that the specific storage ranged from 1.5×10^{-8} to 6.3×10^{-2} and calibrated their model based on the storage coefficient being 7.0×10^{-8} m^{-1}. Converting the calibrated specific storage would result in a value much lower than 10^{-4}.

The BLM improperly argues that storage coefficient is not very important. "The effect of the storage coefficient on the drawdown is greatest near a well or immediately after the start of pumping. At longer times or greater distances, **an order of magnitude change in storage coefficient will result in a relatively small change in the drawdown**" (DEIS, page 4-7, emphasis added). This indicates a lack of understanding of the storage coefficient. It is the amount of water that must be pumped from a unit area for a unit drop in potentiometric surface. An order of magnitude change means that 10 times more or less water removal will cause the same drawdown. In other words, if a given pumping rate will cause 10 feet of drawdown in a year for $S = 10^{-4}$, it will cause 100 feet of drawdown for $S = 10^{-5}$. There is a huge difference dependent on the estimate of storage properties and this estimate is a bad one that will cause the DEIS to grossly underestimate the drawdown.

BLM also used transmissivity values which may be inappropriate (in addition to the storage value discussed above). In the Kane Springs ruling, the Nevada State Engineer ruled that the consultants had overinterpreted the results from the pump test which the BLM accepted for this DEIS. The BLM justified the use of a high transmissivity by comparing it with values in the Prudic et al (1995) professional paper, which had been written to document the results calculated from a large scale steady state flow model. The transmissivity referred to resulted from the steady state calibration of that model. The highest values reported by Prudic et al (1995) were a little greater than 400,000 gpd/ft. Only six percent of the 480 carbonate rock cells in the upper model layer and two percent of all 2456 cells in the lower, all bedrock, layer had transmissivity exceeding 116,000 gpd/ft (Prudic et al 1995, page D43; this is based on a conversion from ft^2/s to gpd/ft) which appear to apply in the vicinity of Kane Springs; high values at Kane Springs would be due to the fact that high transmissivities in the model were clustered upgradient from discharge points (in this case, Muddy Springs) (Prudic et al 1995, page D39). Prudic et al also indicated that the errors in transmissivities are unknown, but could be as much as a factor of 5 (*Id.*).

The biggest problem with the transmissivity estimates from the Prudic et al model is that they are based on isotropic, homogeneous conditions being assumed for a 37.5 square mile model cell. The reality is that flow is through fractures and the calibrated values are a distinct blending of conditions. It is poor support for the use of the pump test results.

Regional Springs

Comment No. 8-2-4

The DEIS claims that Muddy River, Rogers and Blue Point Springs will not be affected by this pumping. This is primarily based on data presented (DEIS, Table 3-4) indicating

Comment No. 8-2-4 (Cont.)

that the amount of carbonate water present in the springs decreases with distance south from the project site toward the Colorado River.

The raw data for this table was not presented and not reviewed herein. In general, Table 3-4 reports that most of the springs, Pahranagat, Coyote, Garnet, Muddy River Big Muddy and California Wash, contain about 60% carbonate water while Rogers and Blue Point Springs contain 39-50 and 42-53%, respectively. Only for the last two was there a range presented; this suggests that if there is more than one observation, there will likely be a range. It is expected that these warm springs have local recharge because the groundwater goes through surface layers, including fill, which would contribute local water just before discharging.

BLM does not explain why springs near the Colorado River include more local recharge which is counterintuitive because the springs discharge in an area of very low rainfall. One possibility not discussed is that water discharging from the Muddy River springs percolates, or becomes river recharge, back into the aquifer system. Once the water flows on the surface, it would experience some evaporation and take on characteristics of local recharge water.

The BLM appears to argue that because the amount of local recharge water increases with distance from Pahranagat Valley, the pumping would not affect these springs (DEIS, page 4-9). The BLM also cites ruling 5712 which argues that there is not substantial evidence that pumping 1000 af/y would impair flows at the springs; it is indeed ironic that the BLM cites this ruling in support of its conclusion of no impact on the springs while ignoring the ruling's science (see discussion above).

However, the BLM may have misrepresented the State Engineer who writes: "The State Engineer finds there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs" (Ruling 5712, page 20). The State Engineer does not conclude there is no impact; he concluded there was no evidence which in a State Engineer's hearing process means that the protestants could not bring sufficient data forward to prove there would be an impact.

The problem with the BLM's conclusion is that there is no place else for the water to go. If pumping decreases the groundwater flowing from Kane/Coyote Springs valleys into the Muddy River Springs basin, as there is no question it will, then water balance considerations require discharge from Muddy River Springs to eventually be decreased. The State Engineer's conclusion appears to be based on the relatively small proportion that 1000 af/y is of the total amount discharge from the springs. Even if all of it were eventually lost from the springs, it may not be sufficient for him to have denied the applications. Ruling 5712 specifically does NOT consider the pumping of 5000 af/y (as the BLM misquotes the ruling).

Also, the BLM relies on the stipulation agreement between the LCWD and USFWS to protect the springs. Unfortunately, by the time the cessation or reduction of pumping in

Response to Comment No. 8-2-4

It is common practice to use a simple analytical calculation when insufficient data precludes the use of a numerical model. In all modeling, assumptions must be made regarding the site conditions versus the mathematical assumptions. While conditions at this site differ from the mathematical assumptions, we believe that application of the Theis equation does provide a reasonable approximation to change in the aquifer conditions expected during pumping. While it is true that the radius of influence around a pumping well will continue to expand with time, it does so with an exponentially decreasing effect. Thus the results shown in Table 4-1 after 100 years of pumping will not change substantially if continued for a longer period of time.

Kane Springs could help recover the springs, it would be too late. The BLM has a requirement in a NEPA document to actually conduct an analysis of the effects of this agreement.

Cumulative Impacts

Comment No. 8-2-5

The DEIS lists numerous projects which are occurring or may occur in the area of Kane Springs. It does not do an independent analysis of the cumulative impacts, but does provide evidence of the gross impacts that would occur. Table 4-7 (DEIS page 4-59) lists three hydrographic areas, Kane Springs, Coyote Spring and Muddy River Springs, as the cumulative impacts area to be considered. Other projects are outside the flow area; the BLM does not consider whether pumping could change the boundaries.

Existing permitted water rights exceed 76,000 af/y which exceed the total 55,000 af/y perennial yield; pending applications total 231,446 af/y, with more than 202,000 af/y in Coyote Springs Valley (Table 4-7, DEIS). Obviously, the development of all these rights would devastate the groundwater resources in the area.

The DEIS reports three modeling studies which each show devastating cumulative impacts of developing the proposed projects. One study conducted by SNWA of pumping 27,512 af/y by SNWA, 4600 af/y by Coyote Springs Development, 2500 af/y by Nevada Power and 7200 af/y by Moapa Valley Water Districts in Upper Moapa Valley would lower the water level in the carbonate aquifer in the Muddy Springs area by 10 feet and decrease the discharge by 4 cfs within 61 years (DEIS, page 4-60). A BLM, NPS and FWS model of a similar area and pumping predicted that there would be reduction of flow in the Muddy River of up to 33% (*Id.*). Both show significant effects even though the results are substantially different. A USFWS model of pumping up to 16,100 af/y from Coyote Spring Valley and California Wash found that flow reduction of 6 percent at the Moapa Valley Wildlife Refuge within 5 years.

The BLM should consider the results of the cumulative impacts analysis presented and do whatever it can to minimize these projects. The BLM could start by improving its analysis of the Kane Springs project and imposing its own restriction, including denying the right-of-way for building the project because the overall pumping proposed will seriously impact resources for which the BLM is responsible.

Recommendations

Comment No. 8-2-6

1) The hydrology aspects of this DEIS have been shown to be grossly inaccurate and insufficient. The water resources sections should be redone considering the following recommendations.

Comment No. 8-2-7

2) The BLM should complete new recharge estimates. It should consider using the estimates from Flint et al (2004).

Response to Comment No. 8-2-5

The reviewer is correct in that the limited lithologic information does not show a continuous aquitard. However, the response of the well during pumping indicates a storage coefficient of 10-4 which is consistent with confined to semi-confined conditions assumed for the study area.

The BLM concurs that the statement "clearly met" is incorrect and the text has been revised in section 4.3.1.3. However, the results from the aquifer test show a storage coefficient of 10-4 which is indicative of semi-confined conditions.

No aquifer in the real world is isotropic and homogeneous. Additional explanation of the validity consequences and uncertainties of this assumption are provided in section 4.3.1.3. of this FEIS.

The commenter is correct that this assumption was not discussed in detail but is listed as a basic assumption. The text has been revised in section 4.3.1.3. to clarify that the carbonate aquifer is nearly infinite in extent, but that fracture flow could limit its response.

With little data (one well) it is not possible to conduct more sophisticated modeling. As described in Chapter 4.3, it is assumed the drawdown cone will not be linear. Whether the Theis model over or under-predicts the drawdown, remains uncertain.

The drawdown from a single well pumping at 5 times its nominal rate, will be greater in the vicinity of the well, than that for 5 separate wells, and thus represents a worst-case scenario.

The comment is true close to the pumping well. However, at greater distances this effect diminishes exponentially.

The values for the transmissivity were obtained from the aquifer test. Comparison with the Prudic model (Prudic D.E., J.R. Harrill, and T.J. Burbey. 1995. Conceptual Evaluation of Regional Groundwater Flow in the Carbonate Rock Province of the Great Basin, Nevada, Utah, and Adjacent States. United States Geological Survey Professional Paper 1409-D) indicates that the result is in reasonable agreement. Table 4-1 shows the computed drawdown for two values of transmissivity which are representative of the local aquifer conditions affected by the Willow Springs Fault (300,000 gpd/ft) and another representative of a lower value, which would be more applicable for a long-term pumping estimate (150,000 gpd/ft).

Response to Comment No. 8-2-6

This statement is based on the NSE ruling 5712 which finds that there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs.

This argument implies that all the water flowing through Kane and Coyote Springs Valleys is captured by the Muddy River Springs. It is highly likely that there is significant flow under and around the Springs which would reduce the effect (if any).

The stipulated monitoring and mitigation plan was examined thoroughly by the USFWS. In addition, the Nevada State Engineer has required that a monitoring plan by approved by his office.

Response to Comment No. 8-2-7

Comment No. 8-2-8

3) The BLM should reconsider and redo its interbasin flow estimates for the Kane Springs Valley. Prudic et al (1995) and Plume (1998) may provide adequate scientific background.

Comment No. 8-2-9

4) The BLM should complete a groundwater model for the flow system of which Kane Springs is a part. It should be predictive and be used to analyze this project and cumulative impacts of the projects listed in the DEIS. The BLM could use the NPS model currently being developed as referenced in the DEIS.

Comment No. 8-2-10

5) Where necessary, the BLM should require the project proponent to collect data necessary to improve the parameterization of the groundwater flow model of the system.

Comment No. 8-2-11

6) The BLM should use its model to analyze the cumulative impacts of the proposed projects in the flow system.

References

Faunt, C.C., J. B. Blainey, M. C. Hill, F. A. D'Agnese, and G. M. O'Brien, 2004. Transient Numerical Model, Chapter F in Belcher, W.R. (ed.), Death Valley Regional Ground-Water Flow System, Nevada and California—Hydrogeologic Framework and Transient Ground-Water Flow Model, Scientific Investigations Report 2004–5205. Prepared in cooperation with the U.S. Department of Energy, Office of Environmental Management, National Nuclear Security Administration, Nevada Site Office.

Flint, A.L., L.E. Flint, J.A. Hevesi, and J.B. Blainey, 2004. Fundamental concepts of recharge in the Desert Southwest: A regional modeling perspective, pages 159-184 in Hogan, J.F., F.M. Phillips, and B.R. Scanlon (ed.). Groundwater recharge in a desert environment: the southwestern United States. American Geophysical Union, Washington DC.

Prudic, D.E., J.R. Harrill, and T.J. Burbey, 1995. Conceptual Evaluation of Regional Ground-Water Flow in the Carbonate-Rock Province of the Great Basin, Nevada, Utah, and Adjacent States. U.S. Geological Survey Professional Paper 1409-D. Washington.

Response to Comment No. 8-2-7

Table 4-7 has been updated and includes Kane Springs Valley, Coyote Spring Valley and Muddy River Springs. The reviewer correctly notes that the pending water rights applications exceed the perennial yield for some of the basins. The NSE will determine which of the applications will be approved.

Cumulative influences of the projects in the cumulative impact area are addressed in section 4.20.4.2 of this FEIS. In addition, the NSE found that there is not substantial evidence that the appropriation of the limited quantity being granted under this ruling will likely impair the flow at Muddy River Springs, Rogers Springs or Blue Point Springs. Finding of NSE ruling are presented in Section 3.3.3.3.1.

Response to Comment No. 8-2-8

The NSE has allocated 1,000 af/y based on the current recharge estimates. Before any increase in pumping can occur the proponent would have to convince the NSE that additional recharge is available.

Response to Comment No. 8-2-9

The NSE has allocated 1,000 af/y based on the current flow estimates. Before any increase in pumping can occur the proponent would have to convince the NSE that additional flow is available.

Response to Comment No. 8-2-10

While NPS is in the process of developing a groundwater flow model for the general area, the results of this model are still pending and currently not available. Furthermore, this model is not site specific to Kane Springs Valley and is not based on any more site specific data for Kane Springs Valley than that presented in the FEIS.

Response to Comment No. 8-2-11

BLM is not required to develop a groundwater model but rather to disclose impacts based upon the best available data. The best available data does not support construction of a groundwater model and such is beyond the scope of this EIS. It should also be noted that a model currently being developed by NPS, due to likely limitations in data availability and related uncertainty, may not provide any better disclosure of possible impacts than the information presented in the FEIS.

Title: Fueling Population Growth in Las Vegas: How Large-Scale Groundwater Withdrawal Could Burn Regional Biodiversity

Key words: groundwater, water rights, public trust, endangered species, ecological integrity

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Fueling Population Growth in Las Vegas: How Large-Scale Groundwater Withdrawal Could Burn Regional Biodiversity

JAMES E. DEACON, AUSTIN E. WILLIAMS, CINDY DEACON WILLIAMS AND JACK E. WILLIAMS

Abstract: *Explosive growth in Las Vegas, Nevada, has stimulated demand for additional water supplies. To meet these needs, local officials hope to obtain rights to about 200,000 acre-feet/year from a regional groundwater aquifer extending from Salt Lake City, Utah, to Death Valley, California. Officials from satellite communities are pursuing rights to an additional 870,487 acre-feet/year. If granted, these new permits would trigger declines in groundwater across at least 78 basins covering nearly 130,000 km^2. Water rights decisions historically interpreted economic development as a more compelling "public interest" than maintenance of natural systems. If economic development continues to drive allocation decisions, consequent declines in the water table, spring discharge, wetland area, and stream flow will adversely impact 20 federally-listed species, 137 other water-dependent endemics, and thousands of rural domestic and agricultural water users in the region. Reducing consumption and implementing cost-effective technologies, such as recovery of urban runoff and shallow saline groundwater, indirect potable water reuse, and desalinization, offer ways to meet metropolitan and ecological needs within the limits of the resource.*

Key words: groundwater, water rights, public trust, endangered species, ecological integrity

Some of the most rapid population growth in the United States is occurring in intermountain west and southwest urban areas where water is in short supply and aquatic ecosystems are stressed (Naiman and Turner 2000, Fitzhugh and Richter 2004). As a result, municipal water consumption is on the rise and water from rural areas is being shifted toward municipal uses. Competition for water is felt keenly in southern Nevada where water is scarce, human population growth is explosive, and confrontations between biodiversity and human needs for water have a long and litigious history.

With an annual growth rate of 5.5% and a population exceeding 1.8 million, Las Vegas, Nevada is among the fastest growing metropolitan areas in the nation. After use of local groundwater produced up to 2 m of land subsidence and a 91 m decline in water table in parts of the metropolitan area (Burbey 1995), the community became primarily dependent on the now drought-stricken Colorado River as its major source of supply. Water demand exacerbated by daily per capita consumption ranking among the nation's highest (both in terms of single family consumption at 660 l/person/day, and total system-wide consumption at 971 l/person/day, Western Resource Advocates 2006) has reached the limits of current supply.

The Southern Nevada Water Authority (SNWA) is pursuing a multi-pronged approach to meet the growing municipal water demand (SNWA 2005). In 2004, SNWA purchased 1.25 million acre-feet of Colorado River water from Arizona to be delivered over the next 15 years as a stop-gap measure. SNWA also has advocated vigorously for new operating rules, currently under review by the Secretary of the Interior, to be used during severe drought conditions on the Colorado River. Further, SNWA plans to tap a regional deep carbonate aquifer extending across central and southern Nevada from Utah to California (SNWA 2004), a tactic simultaneously being pursued by other Nevada counties (e.g., Lincoln, Nye and White Pine).

Great Basin spring systems, although small and isolated, harbor a large proportion of the region's biodiversity and have received significant conservation attention (Deacon and Minckley 1991, Sada and Vinyard 2002). Twenty species listed under the federal Endangered Species Act (ESA) depend upon springs, spring-fed wetlands, and streams in the 78-basin area most likely to be impacted by the proposed SNWA groundwater withdrawals (table 1). Many listed taxa are "umbrella species" that provide protection to little-known, non-listed sympatric species, including at least 137 spring-dependent animal taxa—primarily locally endemic aquatic springsnails, insects, and fishes. The Nevada Natural Heritage Database identifies 347 sensitive taxa within the area (Nevada Natural Heritage Program Database 2005).

Our purpose is to critically examine the SNWA proposals for large-scale groundwater withdrawal, evaluate their potential impacts on aquatic biodiversity, and evaluate whether Nevada water law can avoid decisions "detrimental to the public interest" for a project of this size. The literature reviewed herein demonstrates that deep carbonate and shallow basin fill aquifers are interconnected across the various basins likely to be impacted and that SNWA applications, if granted, are likely to reduce or eliminate many spring and wetland communities in the region with consequent adverse impacts on the rich diversity of spring and wetland-dependent endemic species. We contend that large-scale groundwater withdrawal in Nevada, the most arid state in the US, poses a major under-appreciated threat to biodiversity.

The groundwater flow system

Carbonate rocks deposited in a shallow sea during the Paleozoic underlie a 259,000 square-km carbonate-rock province in the eastern two-thirds of the Great Basin (Fiero 1986). During late Mesozoic, compression, uplift, and low-angle thrust faulting deformed this carbonate layer. East-West extension in mid-Tertiary thinned the carbonate section, caused block faulting, and gave rise to the north-south orientation of mountain ranges characteristic of the Basin and Range. Subsequently, predominantly northeast-southwest oriented fractures and joints formed throughout the brittle limestone and dolomite deposits (Winograd and Thordarson 1975).

While much of the originally 12 km thick carbonate layer in Nevada has become deformed, dismembered and thinned, there remains a 110-160 km wide central corridor of contiguous carbonate rocks typified by an extensive interconnected subterranean fracture network extending 1 to 1.5 km or more below land surface. This corridor integrates a regional-scale drainage network extending from near the Utah-Nevada border through southern Nevada's Spring Mountains and into California, and is capable of transporting large volumes of water (Riggs et al. 1994).

Groundwater typically flows from high elevation montane recharge areas to discharge areas in basin fill sediments of valley lowlands. Flow occurs at various scales resulting in the superimposition of numerous relatively shallow localized basin fill aquifers on the regionally integrated deep carbonate aquifer. Because of the fractured nature of underlying carbonate rocks, water carried in the deep aquifer may originate from all elevations throughout the central corridor. Regardless, shallow aquifers discharge primarily via evapotranspiration and through local springs, while deep aquifers discharge mostly at regional warm springs (Prudic et al. 1995).

Regional springs in the 78 basins examined are the primary natural discharge points from eight major groundwater flow systems (figure 1). Springs from Preston Big Spring southward to Ash Spring are supplied principally from montane recharge areas in east-central Nevada at the "top" of the regional drainage net. Muddy River springs are supplied principally from the north through the central corridor, but also may receive some recharge from nearby Sheep Mountains. Ash Meadows springs are supplied predominantly from recharge areas on the north and northeast slopes of the nearby Spring Mountains, but, along with springs on the east side Death Valley, are partially dependent on regional groundwater movement from the north-northeast through the central corridor (Dettinger et al. 1995). Las Vegas and Pahrump valleys receive most of their groundwater from recharge in southern Nevada's Spring Mountains.

Estimated annual groundwater recharge to the eight flow systems is about 900,000 acre-feet/year (Harrill and Prudic 1998), with about 80% of that attributable to the 78 basins examined (table 2). Subsurface movement of water from one flow system to another supplements groundwater recharge from more local sources. For example, approximately 21,000 acre-feet/year, principally from the White River flow system (a northern subdivision of the Colorado River flow system), supplements groundwater in the Death Valley flow system (Dettinger 1989). Because there is equilibrium between aquifer recharge and natural discharge, wells continuously extracting any part of the annual recharge virtually guarantee equivalent reductions in natural discharge (Dettinger et al. 1995).

Spring systems and groundwater withdrawal

The large number of endemic species occurring at regional springs in the carbonate rock province is due in no small part to the reliability, consistency, and predictability of these wetland and aquatic habitats over millions of years. The springs in Ash Meadows, for example, have been major discharge points from the deep aquifer for the past two to three million years, although three million years ago those springs were more widespread and discharge was greater than at present (Hay et al. 1986).

Climatic variation produced changes in groundwater levels in Ash Meadows over the past 116,000 years, including a 9 m decline in groundwater in the last 15,000 years as Pleistocene lakes disappeared (Szabo et al. 1994). It is notable that over the past century the water table in the adjacent Pahrump and Las Vegas valleys has experienced an extreme drop attributable to groundwater pumping that dwarfs this climatically induced decline.

Development in Las Vegas Valley began in the early 1900s. Groundwater pumping led directly to failure of major valley springs in about 1957 (Harrill 1976), causing extinction of the endemic Las Vegas dace (*Rhinichthys deaconi*) (Miller 1984). Development in Pahrump Valley to the west of Las Vegas proceeded more slowly. None-the-less, Raycraft Spring failed in 1957. Bennett's Spring dried in 1958 and Manse Spring followed in 1975 (Soltz and Naiman 1978, Harrill 1986), extirpating the endemic Pahrump poolfish (*Empetrichthys latos*) throughout its historic range (Deacon 1979) and eliminating a local population of the Spring Mountains pyrg (*Pyrgulopsis deaconi*) (Hershler 1998). Groundwater declines of up to 30 m occurred by 1975 in Pahrump Valley (Harrill 1986) and up to 91 m by 1990 in Las Vegas Valley (Burbey 1995).

In Ash Meadows, major groundwater development initiated in the late 1960s, after reducing both spring discharge and the water table (Dudley and Larson 1976), was curtailed in 1977 and stopped by 1982 (Dettinger et al. 1995). Spring discharge recovered (e.g., Fairbanks Spring, figure 2) and the groundwater table rose steadily through 1987, but reinitiated a slow decline in 1988 that continues to the present (Riggs and Deacon 2004). An analysis by Bedinger and Harrill (2006) indicates that the decline is unrelated to climatic variation, and instead is due to groundwater withdrawal for irrigation at the Amargosa farms area about 25-30 km northeast of Devils Hole. Though some springs throughout the carbonate province tend to demonstrate stable flow, in many valleys there is evidence of decline (figure 2).

As of February 2006, existing groundwater permits authorized withdrawal of 730,587 acre-feet/year from the 78 basins we examined (table 2). This included 156,908 acre-feet/year for municipal uses in the urban areas of Las Vegas and Pahrump and about 573,679 acre-feet/year supporting the present agricultural and rural livelihoods of the area's residents.

These existing permits appropriate 102% of the 78-basin area's cumulative perennial yield, slightly more water than the State Engineer has determined is available each year over the long term. However, permitted withdrawals are not spaced evenly across the landscape, but range from 0% to 1660% of the perennial yields estimated for individual basins. For example, valid groundwater rights presently exist for 376% of perennial yield in Las Vegas Valley, 331% in Pahrump Valley, and 113% for the seven basins (combined in the State Engineer's records) that include Ash Meadows. Existing rights exceed 100% of perennial yield in five of the eight major flow systems underlying the 78-basin area.

Looming threats

The Las Vegas Valley Water District (now SNWA) filed 147 applications in 1989 for rights to unappropriated groundwater from 26 of the 78 basins overlying the region's major groundwater flow systems. Since originally submitted, some applications have been withdrawn and others modified to accommodate rural interests (SNWA 2004). At present, SNWA hopes to obtain rights to 180,800 of the 330,000 acre-feet/year of groundwater for which they have applied. Wells to supply the water are to be drilled into shallow valley fill aquifers, as well as the deep carbonate aquifer of central, eastern, and southern Nevada. The first phase is planned to begin supplying water to Las Vegas as early as 2007, with additional wells and associated pipelines proposed over the coming 50 years (SNWA 2004).

SNWA estimates that by 2050, it will need to add 375,000 to 475,000 acre-feet/year to the 471,786 acre-feet/year presently supplied predominantly from the Colorado River (SNWA 2005). Negotiations with other Colorado River Basin states reached an agreement in principle on 3 February 2006 that SNWA would not exercise its right to about 120,000 acre-feet/year of surface water from the Virgin and Muddy rivers so long as efforts by all basin states to augment flows of the Colorado River provide Nevada with the equivalent of 75,000 acre-feet/year (Jenkins 2006). The agreement also permits Nevada and other basin states to claim "augmentation credit" for water added to the river from other sources. If this augmentation credit is included in the final Colorado River drought condition operations rule, SNWA can claim a credit for any Nevada groundwater that passes through the Las Vegas sewage system, including any water resulting from the new permits for which it has applied. This results in a 70% bonus and constitutes a substantial additional incentive to develop the proposed groundwater project.

Groundwater to be removed from regional aquifers by SNWA does not represent total anticipated new demand on those aquifers. Stimulated by Las Vegas' growth, satellite communities within a few hours drive of Las Vegas (e.g., Coyote Springs, Mesquite, Pahrump, Sandy Valley, Prim, and Lincoln County communities) are being planned, or are expanding rapidly. As of 20 February 2006, those satellite communities were responsible for most of the pending applications for an additional 870,500 acre-feet/year of groundwater from the 78 basins.

Probable future effects of groundwater development

Following the 1989 applications by Las Vegas Valley Water District for all unappropriated groundwater in much of eastern, central, and southern Nevada, considerable effort was directed toward evaluating probable impacts. Schaefer and Harrill (1995) produced a conceptual model of effects on the regional groundwater table, based on the assumption that the project now administered by SNWA was the only source of groundwater removal throughout the region, and total annual extraction was limited to 180,800 acre-feet. Their work suggested effects would be evident throughout the 78 basins examined here. Schaefer and Harrill's work was evaluated and compared to SNWA's ongoing modeling efforts by Principia Mathematica (1997), who, in the process developed their own numerical model. Several groundwater models have been developed for specific basins within the area of probable impact (Durban 2006, Elliott et al. 2006, Myers 2006), most recently focusing on Spring Valley from which SNWA hopes to extract about half of the 180,800 acre-feet per year they seek.

Except for SNWA, all research models produced results consistent with those of Schaefer and Harrill (1995) which projected groundwater level declines of about 0.3 - 488 m throughout 78 basins extending from Sevier Lake, Utah, to Death Valley, California. They suggested a new steady-state might be reached in 100-200 years with groundwater level declines of 15-152 m predominating in both shallow and deep aquifers. Evapotranspiration throughout the region would decline as water tables dropped below the level of phreatophytic root penetration. Over the first 100 years, regional springs fed by the carbonate aquifer would lose about 2-14% of their flow. They would continue to decline over the next 100 years, and may not stabilize before failing. The divergence of conclusions from SNWA is due largely to the fact that SNWA modelers tended to estimate higher precipitation-induced recharge and evapotranspiration-induced discharge than other modelers. This tendency is particularly evident when comparing the model submitted by SNWA in support of their application for water rights in Spring Valley (Durban 2006) to models submitted by the Western Environmental Law Center (Elliott et al. 2006, Myers 2006) in support of their protest to those applications.

Development dreams

Within the 78 basins examined herein, total water demand would be increased to 127% of perennial yield by adding only the 180,800 acre-feet/year sought by SNWA. Addition of the 870,487 acre-feet/year sought by satellite communities would push demand to about 1.8 million acre-feet/year, or 250% of the region's estimated perennial yield. Approval of all applications pending as of February 2006 would put aquifer demand at 271% of perennial yield.

The State Engineer, in accordance with decisions based on state law, is likely to authorize permits for less water than has been requested. While location, depth, and quantity of withdrawal strongly influence the response in the aquifer, addition of only the incremental amount sought by SNWA to the amount withdrawn under existing rights will produce greater reductions in the groundwater table, evapotranspiration, and spring discharge, than simulated by Schaefer and Harrill (1995).

In Lincoln County, applications for groundwater rights by Vidler Water Company tend to locate points of withdrawal closer to regional discharge areas than do applications by SNWA. Consequently, groundwater pumping by Vidler likely will impact regional spring discharge more quickly than will pumping by SNWA whose impacts probably will manifest only decades later. Regional springs most likely to be influenced first by Vidler and later by SNWA wells include the large warm springs in Panaca Valley (Panaca Warm Springs), Pahranagat Valley (Ash, Crystal, Hiko springs), White River Valley (Preston Big, Lund, Moorman, Flag springs), and the Muddy River Springs.

In Nye County, proposed SNWA wells are likely to impact regional spring discharge in Railroad Valley (Duckwater, Lockes and other springs) and Ash Meadows. Though the response will be long delayed by distance from the wellhead, regional springs in Ash Meadows are most likely to be adversely influenced by SNWA wells proposed for Indian Springs, Three Lakes and Tikaboo valleys in the northeastern portion of the Ash Meadows Flow System (Riggs and Deacon 2004). Even before substantial reduction in spring discharge occurs in Ash Meadows, the first impact on existing water rights may be a lowering of the water level at Devils Hole, the one place in the entire carbonate rock province where a surface water right is objectively tied to groundwater level. In fact, there is mounting evidence to suggest that groundwater pumping from the regional aquifer already is producing a decline in the water level at Devils Hole (Bedinger and Harrill 2006).

State water management

The State Engineer manages groundwater and surface waters under Nevada law that recognizes connections between the two. Conflicts between users, whether of surface or groundwater, are resolved according to prior appropriation principles. Thus, senior water rights, both surface and groundwater, limit junior rights – a limitation that would constrain the groundwater withdrawal plans discussed above.

In evaluating the potential impacts of proposed groundwater permits on existing rights, the State Engineer must make a water availability determination based on the aquifer's perennial yield (similar to, but distinct from sustainable yield). Permits beyond the perennial yield of the target aquifer may not be issued.

The Nevada Division of Water Resources (1992) definition of perennial yield (i.e., "*the amount of usable water from a ground-water aquifer that can be economically withdrawn and consumed each year for an indefinite period of time*" so long as it does "*…not exceed the natural recharge to that aquifer and ultimately is limited to maximum amount of discharge that can be utilized for beneficial use*") can be a substantial barrier to conservation efforts. While this definition conceptually prohibits the mining of groundwater, it offers little or no protection for surface water and thus is not a standard amenable to maintenance of wetlands, springs, stream flows, or biodiversity. It also fails to maintain the groundwater table or subsurface interbasin flows. Furthermore, the technical accuracy of perennial yield estimates for some local and regional aquifers has been questioned (SNWA 2003).

Malmburg's (1967) estimate of perennial yield for Pahrump Valley provides an excellent example of the methods and assumptions commonly used. The maximum "salvageable discharge" available for appropriation included: 1) all net spring discharge, 2) estimates of evapotranspiration from areas of shallow groundwater, 3) estimates of water salvageable from the amount leaving the shallow aquifer as subsurface outflow from the basin, and 4) estimates of water salvageable from the amount leaving the basin via subsurface outflow in the deep aquifer.

This method of determining perennial yield anticipates that permits issued will dry all springs and kill all phreatophytes, with consequent losses in biodiversity. It anticipates lowering of the groundwater table, a consequent increase in pumping costs, and the likelihood of land subsidence. It foresees reductions in both shallow and deep interbasin subsurface flows supplying down-gradient basins and their springs, thereby establishing a "drain" on shallow aquifers in surrounding valleys and in the regional deep carbonate aquifer (figure 3). These predictable consequences result directly from issuance of permits equivalent to 100% of "perennial yield." Unfortunately, despite the clear requirements of law, permits commonly are issued for many times that amount.

Clearly, several factors confound attempts to unambiguously quantify the extent of expected detrimental impacts. Predicting the "final steady state" of the groundwater system in response to massive groundwater removal is complicated by disagreement over recharge from precipitation, discharge from evapotranspiration, connectivity among aquifer components, and the time required to reach a new equilibrium. There is no question, however, that the state's definition of and methodology for determining the quantity of water that legally may be withdrawn fails to envision maintenance of natural systems. As a result, it is nearly impossible for the State Engineer to issue groundwater permits in support of urban development while protecting existing water rights, including those protecting recreational resources and biodiversity.

How might protection be achieved?

In the 1976 U.S. Supreme Court case *Cappaert v. United States*, the court ruled that Devils Hole had an implied reservation of water, noting that a 1952 Presidential Proclamation made Devils Hole a disjunct part of Death Valley National Monument (now National Park) (Deacon and Williams 1991). The court stated that "[w]hen the federal government withdraws its land from the public domain and reserves it for a federal purpose, the government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation." The Presidential Proclamation specified the Devils Hole withdrawal was intended to protect the "unusual features of scenic, scientific, and education interest . . . [including] a remarkable underground pool . . . [and] a peculiar race of desert fish." By this language, the federal government secured its right to the groundwater required to maintain the pool in Devils Hole and the endemic Devils Hole pupfish (*Cyprinodon diabolis*), vesting the right with a 1952 priority date. This implied reservation prohibits subsequent junior water users from receiving water rights that undermine conservation of the unique features of Devils Hole that led to its withdrawal, thereby benefiting not only the pupfish but also the endemic Devils Hole riffle beetle (*Stenelmis c. calida*), other species in the system, and it's unique ecology and geology.

The federal government also has reserved other centers of aquatic biodiversity because of their unique water resources and accompanying wildlife. Pahranagat National Wildlife Refuge (NWR), established in 1963 to provide habitat for migratory waterfowl, also protects an endemic subspecies of speckled dace (*Rhinichthys osculus* ssp.). Moapa NWR, established in 1979, provides habitat for the endangered Moapa dace (*Moapa coriacea*) and other rare aquatic spring endemics. Ash Meadows NWR, withdrawn in 1984 "to provide water habitat resources in Nevada for the protection of waterfowl and fish" protects a total of 15 federally-listed species, including nine dependent on springs or spring-fed wetlands as well as 103 "at-risk" plant and animal taxa. If pressed, the courts likely would determine that the federal government has implied water rights to groundwater germane to the purposes of all these reservations with a priority date corresponding to their date of withdrawal. It is possible the implied reservation of water doctrine also would apply to lands acquired—as opposed to reserved—after statehood; however, that application has never been tested in court.

While the principles learned from *Cappaert* provide some protection when a species inhabits habitat within reserved lands, the federal ESA may afford additional protection to threatened and endangered species dependant upon habitat supported by discharge from groundwater aquifers. While current large-scale groundwater plans presently do not envision expenditure of federal monies, the proposals do envision many well sites on and pipeline corridors across Bureau of Land Management administered lands, necessitating a federal permit and triggering the ESA's Section 7 consultation provisions to ensure that federal actions do not jeopardize listed species. Furthermore, Section 9 of the ESA prohibits "take" of listed species regardless of whether a federal action is involved.

All water within Nevada belongs to the public. The Nevada State Engineer has a "continuing responsibility as a public trustee to allocate and supervise water rights so appropriations do not 'substantially impair the public interest in the lands and waters remaining'" (*Mineral County v. Dep't of Conservation and Natural Res.*, 20 P.3d 800, 808-09 (2001) quoting *Illinois Central R.R. v. Illinois*, 146 U.S. 387, 452, (1892)). Traditionally, the public trust doctrine protected the public's interest in navigation, fishing, and commerce. However, the doctrine has evolved to encompass additional public values, including recreational and ecological uses.

Fahmy (2005) observed that, subsequent to the *Cappaert* decision, the State Engineer increasingly has interpreted the "public interest" to include environmental values such as endangered species. Beyond helping conserve "at-risk" species, Fahmy suggests that continuing judicious use of the public interest standard also could help maintain state sovereignty over water resources allocation and administration.

Achieving ecologically sustainable water use

Providing for the water needs of a growing Las Vegas Valley by relying on historical practices is a recipe for an ecological disaster that includes loss of wetlands, spring-dependant species, and phreatophytic communities. New technologies can help increase water availability and efficiency of use, but in the long run are futile unless combined with reduced growth of human populations. Reducing per capita consumption could align Las Vegas residents' water use with those already realized in other major southwestern U.S. cities (e.g., Albuquerque and Tucson, figure 4).

Water for lawns and other external use outside the home offers the largest opportunity for cutting back single-family residential consumption. Mayer et al. (1999) calculated that approximately three-fourths of residential water consumed in Las Vegas could be attributed to external rather than internal use. Western Resource Advocates (2006) calculates that, by 2030, converting 50% of Las Vegas Valley's single family residential landscaping to xeriscape would reduce demand by 80,000 acre-feet/year, while indoor water conservation could reduce demand by more than 70,000 acre-feet/year.

As in other southwestern cities, substantially lower consumption rates would result from increasing the price differential between tiers in the tiered rate structure already in place, and by implementing a range of other widely recognized measures to improve efficiency of water use (Western Resource Advocates 2003, 2006). For new developments where retrofitting is unnecessary, low per capita consumption can be even more easily achieved simply by requiring serious water efficiency as a condition of development. Opportunities to reduce per capita water consumption to the low rate of 380 l/person/day have been identified for a new 648 ha development in Las Vegas (Rocky Mountain Institute 2003). Comparable opportunities are available throughout Las Vegas Valley.

As a reuse or recycling strategy for Las Vegas' tertiary effluent, membrane treatment could recover an amount of water comparable to that presently being obtained through "return-flow credit," a water accounting system allowing Las Vegas to reuse water of Colorado River origin pumped from and then returned to Lake Mead. In addition, a membrane treatment system would make it possible to use saline water (originating as landscape irrigation water) perched above the valley fill aquifer. This shallow saline groundwater reportedly is accumulating at about 100,000 acre-feet/year (SNWA 2006) and increasingly is flooding basements and creating other problems. Combined with urban runoff (which equals approximately 35,000 acre-feet/year) and intermittently available floodwaters, both of which currently move through flood control channels to Las Vegas Wash and into Lake Mead, these sources have an apparent cumulative recovery potential of more than 135,000 acre-feet/year. Following membrane treatment this water could be used directly in the potable supply or indirectly as groundwater recharge. Membrane treatment would have the additional advantage of removing approximately 700,000 tons of salt per year (an amount approximating the total removed by all Bureau of Reclamation Colorado River Basin salinity control projects implemented to date) as well as a number of other environmental contaminants presently identified as problematic – including endocrine disrupting compounds, personal care and pharmaceutical products, pesticides, chemicals used in plastic manufacturing, and artificial fragrances (Hinck et al. 2006) – and could substantially improve water quality in Las Vegas Valley and the lower Colorado River.

One approach taken by several communities to more efficiently manage consumption is direct or indirect reuse of highly treated effluent, a method becoming increasingly attractive as costs increase for water development, importation, and disposal. Reuse projects based on membrane treatment (microfiltration/ reverse osmosis) of tertiary effluent are in place or under construction in Los Angeles, El Paso, Scottsdale, and many other places around the world (Durham et al. 2003). Such projects produce water that could be "reused" immediately in potable or irrigation supplies (i.e., direct reuse) and/or reused later after recharging groundwater aquifers that are tapped to support domestic water supplies (i.e., indirect reuse). Currently, most direct reuse projects are designed to meet irrigation water demands, whereas reuse designed to supply potable water generally are indirect reuse projects. Preliminary calculations (Johnson 2005) demonstrate that a membrane treatment system for Las Vegas would cost approximately as much as a proposed effluent dilution project (~$800 million), and would produce water with a unit cost significantly less than the $6,050 per acre-foot that the Coyote Springs Development, under construction approximately 50 miles northeast of Las Vegas, recently agreed to pay.

Although the hydrogeology in southern Nevada is unique, concerns regarding ecological impacts from groundwater withdrawal exist across the western United States. For example, the dependence of San Antonio, Texas, on groundwater from the Edwards Aquifer for municipal water supplies increasingly has impacted the endangered fountain darter (*Etheostoma fonticola*). Ultimately, minimum spring flows needed to avoid jeopardizing the darter's existence were established and the Texas legislature mandated that the Edwards Aquifer Authority improve water management and conservation, leading San Antonio residents to reduce per capita water use by 24% between 1984 and 2000 (Fitzhugh and Richter 2004).

Richter et al. (2003) suggested defining ecologically sustainable water management as "protecting the ecological integrity of affected ecosystems while meeting intergenerational human needs for water and sustaining the full array of other products and services provided by natural freshwater ecosystems." Whether adhering to that standard of sustainability, or Nevada's considerably riskier standard of "perennial yield," we must acknowledge limits to water availability as we strive to strike a balance between human water demand, the needs of natural systems and future generations. Adherence to traditional standards virtually guarantees immediate ecological crises and unnecessary adversity for future generations. Those crises will manifest in litigation, "water wars," federal/state conflicts, and loss of springs, wetlands, phreatophytic communities, and biodiversity. Only through changed personal and community relationships with the earth and its waters are we likely to succeed in conserving our ecological heritage while building a sustainable society.

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Table 1. Native, spring-dwelling and riparian species known from the area of projected groundwater decline in Lincoln, Clark, White Pine, Nye and eastern Esmeralda counties, Nevada; eastern portions of Inyo and San Bernardino counties, California; western portions of Washington, Iron, Beaver, Millard, and Juab counties, Utah; and northwestern Mohave County, Arizona. Complete species listing available from the authors.

Taxa Group*	Endangered	Threatened	Other
Mammals	1	0	2
Birds	2	0	1
Fishes	11	2	31
Amphibians	0	0	4
Aquatic Insects	0	1	50
Springsnails	0	0	49
Plants	1	2	NA
Total	15	5	137

*Species listed as endangered or threatened include: mammals: *Microtus californicus scirpensis*; birds: *Empidonax trailii extrimus* and *Rallus longirostris yumanensis*; fishes: *Plagopterus argentissimus, Gila seminuda, Rhinichthys osculus nevadensis, Moapa coriacea, Empetrichthys latos, Cyprinodon nevadensis mionectes, Cyprinodon diabolis, Cyprinodon nevadensis pectoralis, Lepidomeda mollispinis pratensis, Lepidomeda albivallis, Crenichthys baileyi grandis, Crenichthys nevadae,* and *C. b. baileyi* ; insect: *Ambrysus amargosus*; and plants: *Centarium namophilum, Ivesia kingii* var. *eremica,* and *Nitrophila mohavensis.*

Table 2. Water rights currently allocated and applied for, expressed as acre-feet and percent perennial yield, in 78 basins likely to be impacted by proposed largescale groundwater pumping. Data from Nevada Division of Water Resources Water Rights Database accessed 20 February 2006 (http://water.nv.gov/Water%20Rights/permitdb/permitdb_index.cfm), data for Snake and Hamlin valleys obtained from Utah Division of Water Rights August 2005. Ground water level decline is projected by Schaefer and Harrill (1995) for only parts of South-Central Marshes, Goshute Valley, and Great Salt Lake Desert flow systems, but is anticipated throughout all basins in the other five flow systems.

Flow System	Area (km^2)	# Basins w/ Groundwater Declines	Perennial Yield (acre-ft)	Current Rights (acre-ft)	Current Rights (% PY*)	Rights plus Applications (acre-ft)	Rights plus Applications (% PY)
South-Central Marshes	17,586	4	31,000	41,516	134	44,076	142
Death Valley	40,922	24	86,610	112,590	130	128,619	149
Railroad Valley	10,697	4	91,500	30,792	34	242,407	265
Penoyer Valley	1,813	1	4,000	14,461	362	17,662	442
Colorado	42,217	35	248,800	312,916	126	911,964	367
Goshute Valley	9,428	1	70,000	95,928	137	119,349	170
Mesquite Valley	611	1	2,200	1,099	50	4,407	200
Great Salt Lake Desert	46,620	8	185,500	125,700	68	480,489	259
Total	169,894	78	719,610	735,003	102	1,948,973	271

* % PY = percent perennial yield

Figure 1. Simulated final steady-state groundwater level in valley fill (A), and deep carbonate aquifers (B) in eight major flow systems of Nevada, Utah, and California projected to occur as a consequence of pumping 180,800 acre-feet/year of water from specific well locations in specific quantities as proposed by the Southern Nevada Water Authority. This simulation assumes no groundwater removal other than the 180,800 acre-feet/year projected to be pumped by SNWA from 17 basins of east-central and southern Nevada. The eight major groundwater flow systems affected are numbered as follows: 1-Mesquite Valley, 2- Death Valley Flow System, 3-Colorado Flow System, 4-Penoyer Valley, 5-South-Central Marshes Flow System, 6-Railroad Valley Flow System, 7-Goshute Valley Flow System, 8-Great Salt Lake Desert Flow System. Modified from Schaefer and Harrill 1995, and Harrill and Prudic 1998.

Figure 2. Annual mean discharge (cubic meters per second) from 5 representative springs in Nevada from 1875 to 2005. Data provided by J. Wilson, US Geological Survey, Las Vegas, NV.

Figure 3A. Conceptual diagram of long-term effects of groundwater withdrawal on the variously integrated valley fill and deep carbonate aquifers in Nevada. See text (Groundwater flow system) for further description of the regional aquifer. (A) Near-term: Wells in the valley fill aquifer create a localized cone of depression; wells in the carbonate aquifer produce artesian flow; surface waters and biotic communities are imperceptibly affected.

Figure 3B. Mid-term: Water table in the valley fill aquifer is substantially lowered and local springs supported by this shallow aquifer fail; carbonate aquifer loses its artesian pressure as the deep water table declines and regional springs supported by this deep aquifer decline; groundwater from adjacent basins flows down-gradient toward the reduced pressure caused by the lowering deep water table.

Figure 3C. Late-term: A new steady-state develops in both shallow and deep aquifers within the basin subjected to groundwater withdrawal; the downhill groundwater gradient towards the sites of withdrawal causes lowering of water tables and failure of local and regional springs in adjacent basins.

Figure 4. Changes in single-family residential per capita water consumption in selected southwestern USA cities from 1994 to 2005. Data from Western Resource Advocates (2006).

FIG 1A - SIMULATED WATER-LEVEL DRAWDOWNS AT FINAL STEADY-STATE

UPPER LAYER MODEL

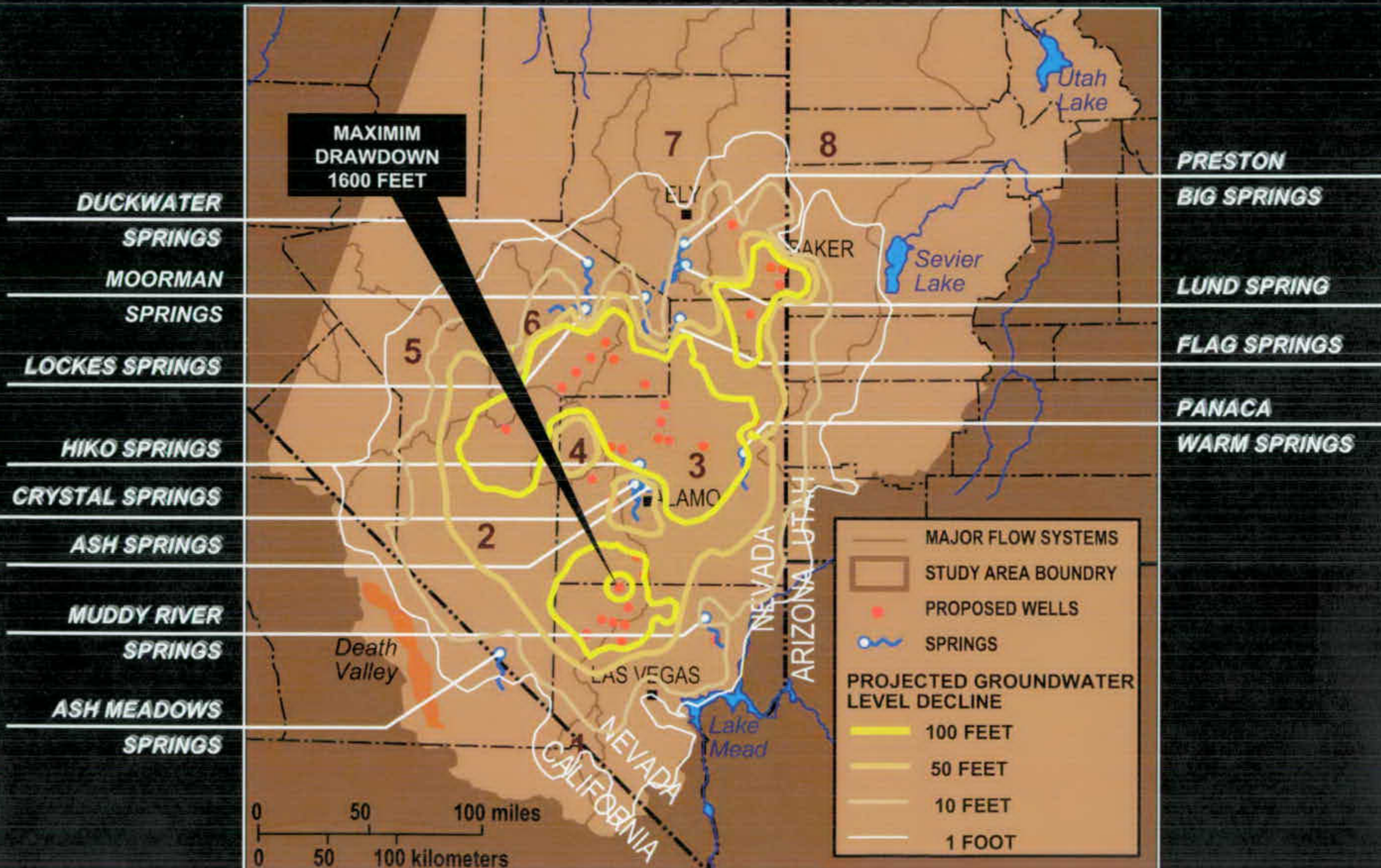


FIG 1B - SIMULATED WATER-LEVEL DRAWDOWNS AT FINAL STEADY-STATE

LOWER LAYER MODEL

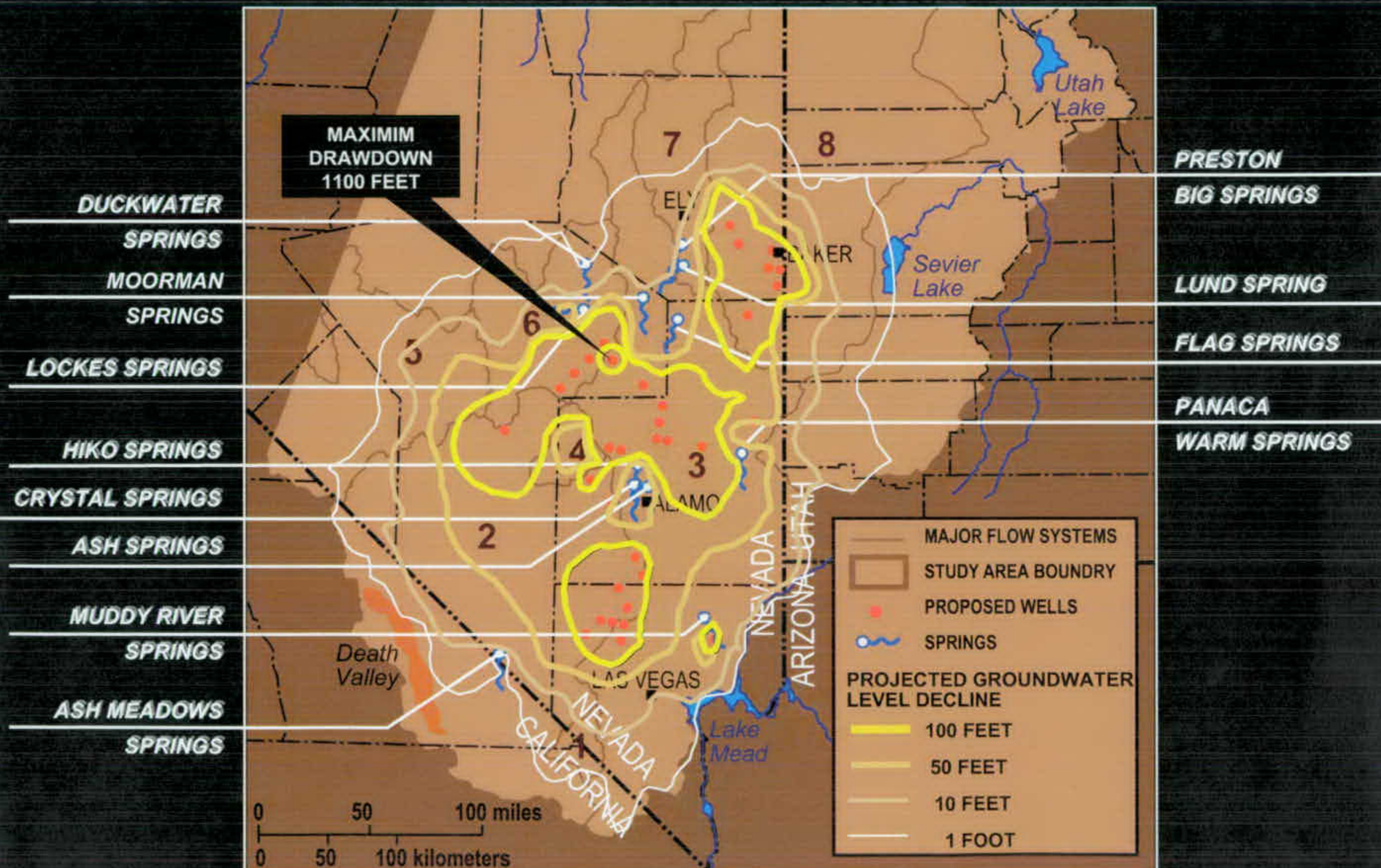


FIG 2 - HISTORICAL CONSEQUENCES

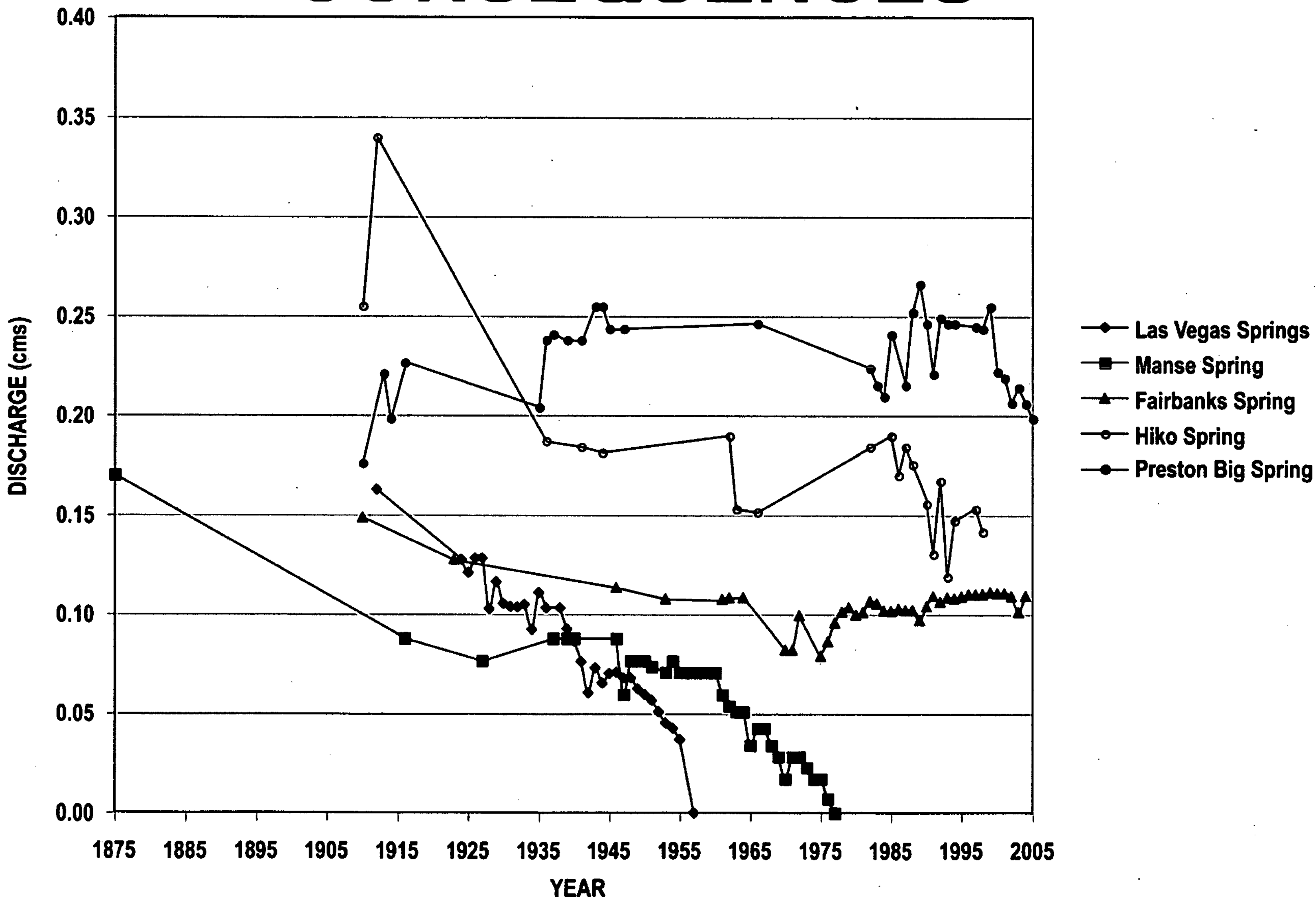


Fig 3A

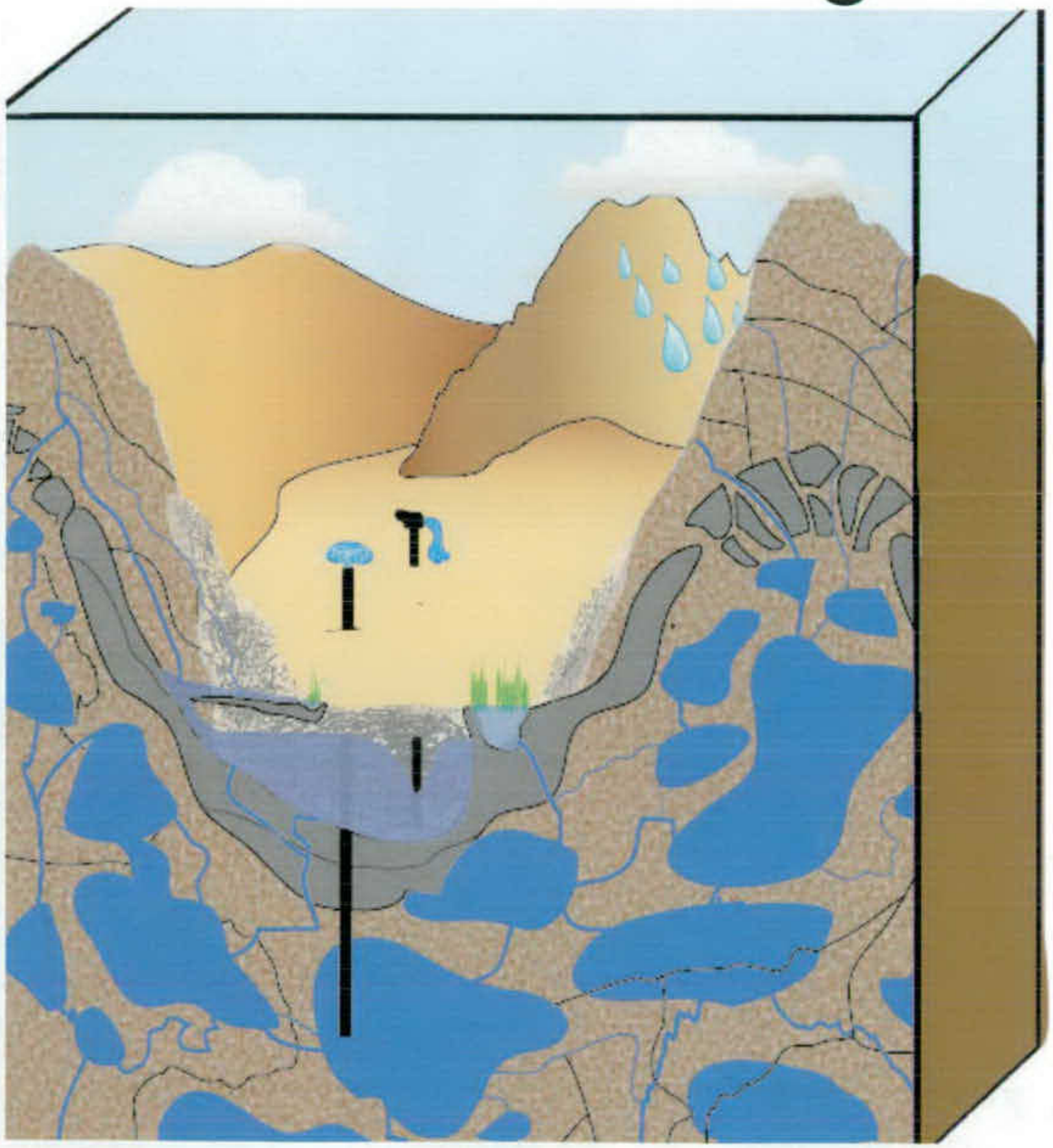


Fig 3b

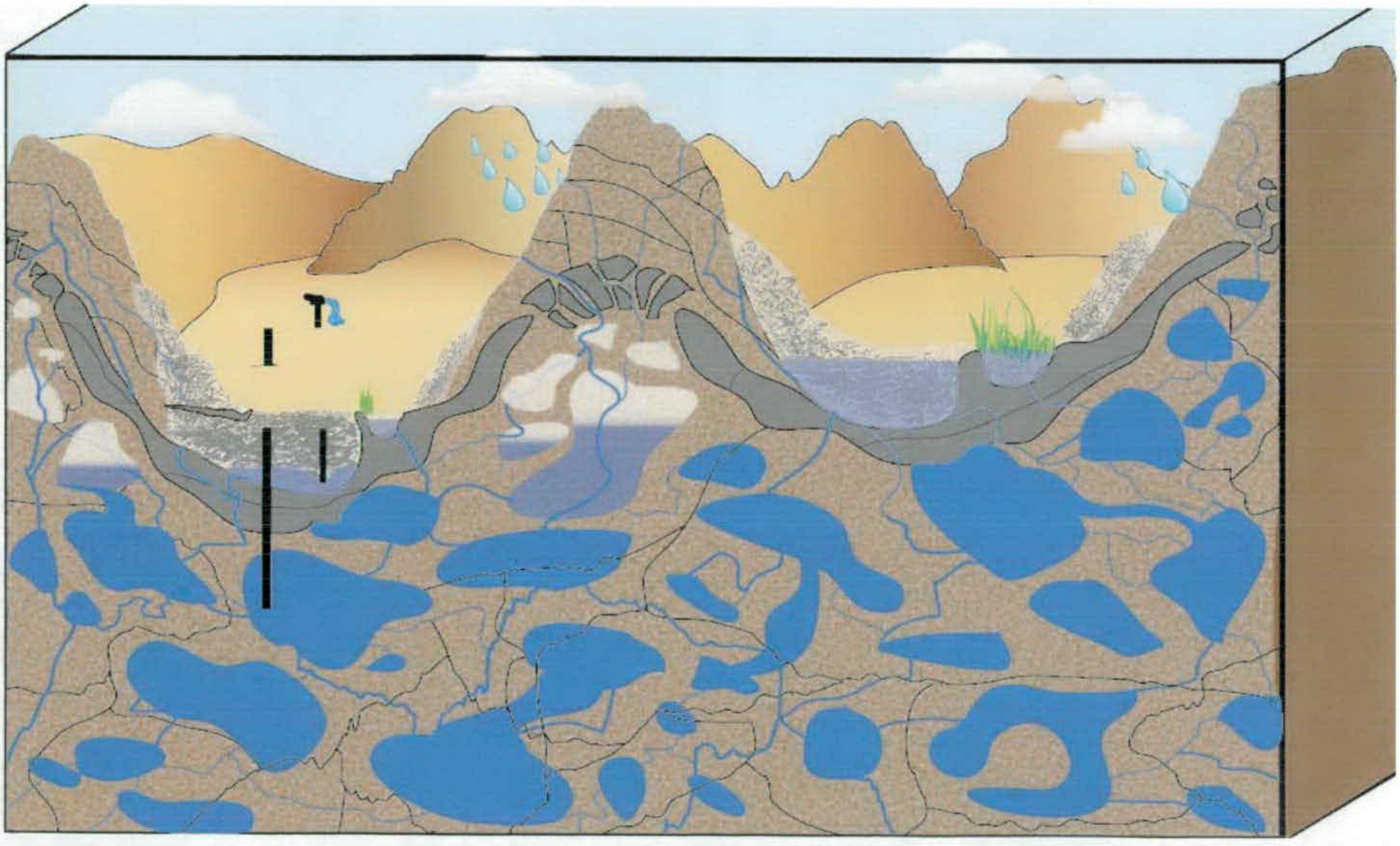


Fig 3c

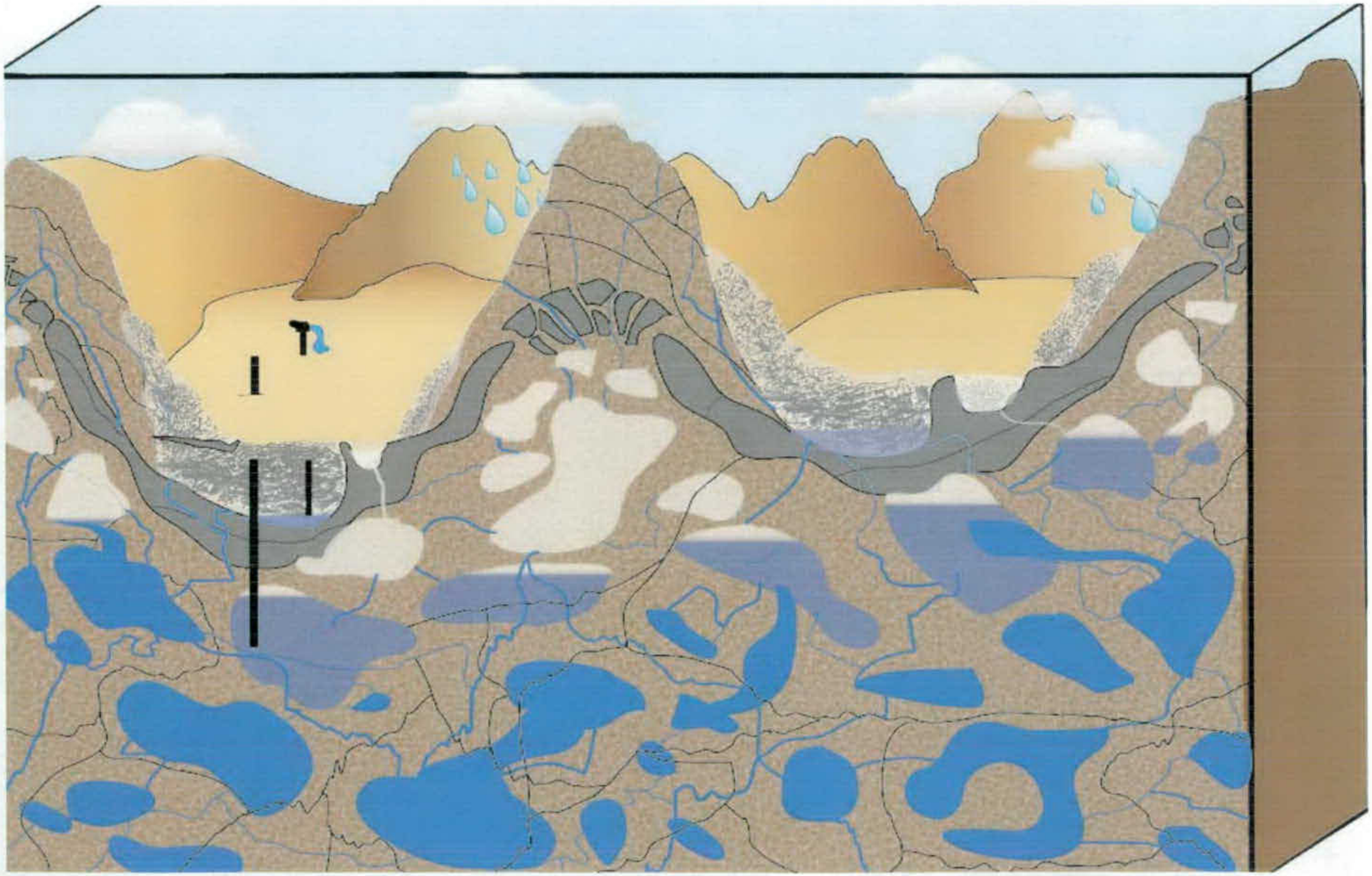
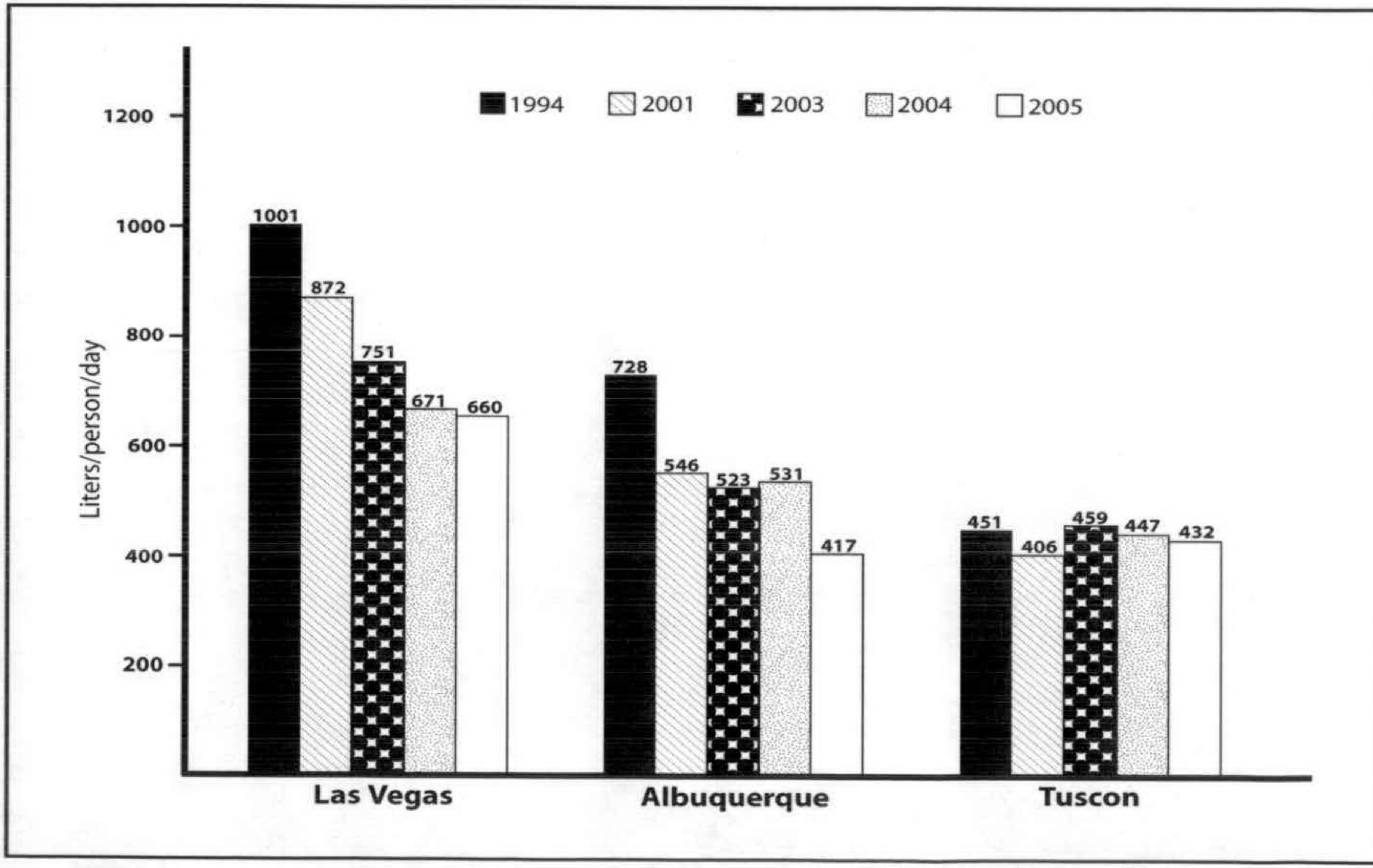


FIG 4 - Water Conservation:
Have We Done Enough?



Penny Woods
Project Manager
BLM/Groundwater Projects Office
PO Box 12000
Reno, NV 89520

In reference to the draft Environmental Impact Statement for the proposed transfer of 1,000 to 5,000 acre-feet annually to Coyote Springs, the Progressive Leadership Alliance of Nevada has the following concerns:

Comment No. 9.1

The Bureau of Land Management has failed to look at the overall impact the Coyote Springs development will have on the region. The water transfer and the development are inherently linked. Without the water, there will be no development; without the pipeline, there will be no water. Thus, the BLM made a decision contrary to years of federal precedent and the clear intent of the National Environmental Policy Act by failing to look at all the associated impacts within the draft EIS.

Comment No. 9.2

The Kane Springs project, additionally, must be considered in the light of the other groundwater development projects going on throughout the region, including the numerous substantial applications for water use coming from the Southern Nevada Water Authority. Failure to broaden the analysis to include the many parallel applications threatens the environment because of a deliberately incomplete analysis.

Comment No. 9.3

PLAN also is concerned that the scientific basis for the draft EIS is seriously flawed. The Nevada State Engineer rejected the same flawed science produced by the project advocates in his ruling on the Kane Springs application. The BLM has a responsibility to be at least as rigorous as the state agency.

Finally, we would argue that the BLM has a statutory responsibility to thoroughly consider all alternatives to the Kane Springs pipeline. We do not believe that has been done.

For these reasons, PLAN urges the BLM to bring the draft EIS back to the agency and conduct a complete, thorough and scientifically sound process.

Thanks you for your consideration of our comments.

Launce Rake
Communications Director
Progressive Leadership Alliance of Nevada
(702) 791-1965
732 S. 6th St., Suite 200
Las Vegas, NV 89101

Response to Comment No. 9-1

The CSI development is a separate action from the Kane Springs Groundwater Development Project. The CSI development would occur in the absence of the Proposed Action. Currently, 35,096 AFY of groundwater has been permitted within the Coyote Springs Basin for a variety of uses. Groundwater from Kane Springs Valley will be used to supplement these uses which include municipal, agricultural and industrial applications. In the interest of understanding reasonable foreseeable future actions in the region of influence, the Final EIS contains an expanded discussion of CSI proposed actions in Clark and Lincoln County. This information has been added to Chapter 4.20.3.3.2.

Response to Comment No. 9-2

Early in the NEPA compliance process, BLM considered whether to include all of the groundwater projects in a single NEPA analysis. For the following reasons, BLM concluded that all of the groundwater projects should not be included in a single NEPA analysis, but rather treated as separate Right-of-Way applications: 1) the projects are located in different geographic areas; 2) they each are drawing water from different hydrographic basins; 3) they are not dependent one upon the other; 4) they are being developed in differing timeframes and the related water is demanded at different times; and 5) the water being developed by each is being used in distinctly different locations.

Response to Comment No. 9-3

Environmental resource data was collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives. The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. However, there is a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved. Uncertainties related to this project are discussed in Incomplete and Unavailable Information section at the beginning of Chapter 4.

Rose Strickland
<rosenreno@sbcglobal.net>
08/20/2007 09:14 PM

To nvgwprojects@blm.gov
cc Penny Woods <penny_woods@blm.gov>
bcc
Subject Fwd: letter plus attachments in body of the message

Toiyabe Chapter
P.O. Box 8096
Reno, NV 89507

August 20, 2007

Penny Woods, Manager
BLM/Nevada Groundwater Projects
PO Box 12000
Reno, NV 89520

Re: draft EIS for the Kane Springs Valley Groundwater Development Project

Dear Manager Woods,

On behalf of the 5,500+ members of the Toiyabe Chapter of the Sierra Club in Nevada and the eastern Sierra, I am submitting comments on the draft Environmental Impact Statement for the Kane Springs Valley Groundwater Development Project (draft EIS). We would like to incorporate herein the comments of the Great Basin Water Network. The Sierra Club is very disappointed at this document because it is essentially unresponsive to the extensive public scoping comments about issues to be studied in this controversial project, fatally flawed in meeting many NEPA requirements and wholly deficient in protecting public lands and resources in eastern Nevada.

We hesitate to provide lengthy comments on the draft EIS, both because BLM has ignored most of our extensive scoping comments, but also because there's so little substantive information and analysis in this document to review. Our specific comments follow:

Comment No. 10.1

1. SCOPING COMMENTS: The Sierra Club submitted (attached) 14 pages of scoping comments on April 20, 2006 and an additional 10 pages of scoping comments on April 24, 2006. The scoping report published by the BLM on its website does not reflect the extensive scoping issues raised by the Sierra Club comments nor by other commenters, nor does the draft EIS address the majority of scoping issues. Instead, the BLM apparently decided to develop "criteria" (p.ES-11) which eliminated consideration of suggested alternatives and eliminated the need for analysis of the majority of scoping issues raised by the public, including most impacts caused by the recipient of the exported water, the Coyote Springs development. This development will radically change the character of this small rural county by supporting over 100,000 additional residents), yet was effectively ignored in the dEIS. Under what authority can BLM define a proposed project so as to eliminate addressing public concerns about the proposal fully described in extensive scoping comments?

Comment No. 10.2

2. RANGE OF ALTERNATIVES: The draft EIS does not meet NEPA requirements to consider a full range of alternatives. The proposed action and a variant of the pipeline route and no action do not constitute a full range of alternatives and do not consider the many alternatives suggested in public scoping comments. Under what authority can BLM define a proposed project so as to eliminate addressing public concerns about the proposal and suggested alternatives fully described in extensive scoping comments?

Comment No. 10.3

3. IMPACTS ANALYSIS: The draft EIS does not meet NEPA requirements to fully analyze the impacts of the proposed federal project. The BLM only analyzes (p. 4-1) some effects of pipeline construction, operation and

Response to Comment No. 10-1

All issues submitted to BLM were addressed in Chapter 1. As explained in Chapter 1.5 - Scoping, the BLM considered comments received through public scoping when developing the scope of issues and alternatives to be analyzed in the Draft EIS. All comments received during scoping were systematically reviewed by an interdisciplinary team of resource specialist from various BLM offices, representatives from cooperating agencies, and the BLM's EIS consultants. Further, the CSI project is already under construction and the Proposed Action analyzed in this EIS would enable construction of infrastructure to provide a small component of the water resources being developed to serve this ongoing development.

Response to Comment No. 10-2

The purpose and need section of this DEIS provides a context and framework for establishing and evaluating the reasonable range of alternatives. There is a need for developing sustainable water supplies as outlined in the 1999 Lincoln County Water Plan: To assist and support the needs of local communities in Lincoln County, including Coyote Spring Valley; To meet the needs of future economic development within Lincoln County; and To produce, purchase, wholesale and transport water from sources inside of Lincoln County to meet customer water needs across the region.

Response to Comment No. 10-3

As part of the water appropriation permit application review and authorization, the Nevada State Engineer has the authority to approve and

Comment No. 10.3 (Cont.)

maintenance, but fails to analyze the environmental and socio-economic impacts of the delivery and use of 1,000 to 5,000 acre feet of groundwater each year to the Coyote Springs (p.4-34) development, fully covered in public scoping comments. Inadequate science (see point #4) apparently lead to BLM's conclusion that the project will cause no significant adverse environmental impacts by the even limited project. How can BLM do an adequate analysis of environmental impacts of a pipeline disconnected with the delivery of the water to its place of use? How can BLM claim (p.4-35) that mitigation for the impacts of 1,000 acre feet project would be adequate for the 5,000 acre feet project (full buildout), a project larger by four orders of magnitude?

Comment No. 10.4

4. SCIENCE: The draft EIS used scientific data and studies in its impacts analysis which was offered by the project proponent and is not peer-reviewed or independent or appropriate to an impacts analysis. In addition, much of the proponent's "science" was rejected by the State Engineer in his ruling on the water applications in Kane Springs Valley as inadequate or flawed (see ruling in Appendix B). The use of inadequate science has lead to significant flaws in the consideration of available water (recharge) as well as the impacts of pumping and removal of groundwater in the dEIS. How did the BLM assess the sufficiency and adequacy of available information to describe and analyze baseline conditions and impacts of alternatives? Additional studies are needed to document baseline conditions and to analyze potential impacts of the proposed project, as fully described in the Sierra Club and Great Basin Water Network scoping comments.

Comment No. 10.5

5. MITIGATION AND MONITORING: The draft EIS mentions mitigation and monitoring project impacts, but proposes only "some" wells to do so while relying on other agencies and the project proponent to monitor and mitigate environmental damage. This entire section is inadequate and violates NEPA requirements. How will the BLM enforce its mitigation promise (p.4-9) that "any water impacts within the system would be controlled and mitigated by ceasing all pumping activities if the water discharged in the Warm Springs area drops below 3.0 cfs?"

Comment No. 10.6

6. CUMULATIVE IMPACTS ANALYSIS: While the draft EIS devotes many pages to what it calls "cumulative impacts analysis," there is no attempt to estimate either the impacts of up to 14 projects which will be pumping and exporting water in eastern Nevada, nor to require any effective mitigation for cumulative impacts. Instead, the draft EIS cites various "stipulated agreements" and "MOAs" (p. 4-10) between the project proponents and federal agencies and other developers to minimize the potential significant adverse environmental impacts on threatened and endangered species and other public resources. Yet BLM is not a party to the agreements and the agreements are uncertain since there is no enforcement mechanism. The draft EIS statements about BLM "coordinating" or "working collaboratively" with agencies with authority to "ensure" no cumulative impacts (pp. 4/63/64) do not meet NEPA requirements.

Comment No. 10.7

There are many other serious flaws in the draft EIS including no actual locations of wells, roads and facilities (subject to "final design"), piecemealing NEPA requirements for analyzing impacts of related projects, failing to protect public lands, national parks and wildlife refuges and biodiversity in eastern NV.

Comment No. 10.8

The Sierra Club finds that the draft EIS is seriously flawed and does not meet NEPA requirements. We strongly urge the BLM to develop an EIS which seriously addresses public scoping comments, which is based on adequate project description and scope, which uses independent and adequate science, which adequate assesses environmental impacts including cumulative impacts and which proposes realistic mitigation and adequate monitoring.

Thank you for considering our comments. Please call us to clarify points or answer questions on our dEIS comments.

Sincerely,

/s/

Rose Strickland
Water Campaign Coordinator
775 329-6118

Response to Comment No. 10-3 (Cont.)

control the amount of groundwater pumped from basins in Nevada. The BLM has the authority to approve or deny the right of way application for use of federal lands.

Response to Comment No. 10-4

Environmental resource data was collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives. The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. These data were reviewed by the cooperating agencies (Chapter 5.2) and accepted by BLM scientists. There is, however, a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved. Uncertainties related to this project are discussed in the Incomplete and Unavailable Information section at the beginning of Chapter 4.

Response to Comment No. 10-5

Applicant proposed environmental protection measures to reduce or minimize construction-related impacts are incorporated in the project design and outlined in Appendix C (Standard Construction and Operating Procedures). Potential impacts associated with implementation of mitigation measures that could be required by BLM for the pipeline right of way, or another permitting agency, are described in section 4.20.4.2 of this Final EIS for each resource. The BLM would monitor the effectiveness of approved mitigation measures (i.e. desert tortoise fencing, installation of perch inhibitors, revegetation). In addition, the Applicant must comply with specific stipulations directed by the NSE for allocation of water supplies and by the USFWS for groundwater pumping and potential impacts to the Muddy River Springs area.

Response to Comment No. 10-6

Chapter 4 (Environmental Consequences) describes potential indirect impacts to regional springs and other sensitive resources within the project region of influence. Chapter 4.20 (Cumulative Impacts) describes potential cumulative impacts to regional springs and other sensitive resources within the cumulative impact region of influence. Applicant proposed Environmental Protection Measures are listed in Appendix C. Monitoring and mitigation program is discussed above. As part of NEPA, BLM is required to disclose all relevant mitigation, even those not within BLM's authority, and has done so in this FEIS..

Response to Comment No. 10-7

See response to comment 10-4 above.

Response to Comment No. 10-8

The BLM uses a comprehensive process to determine whether rights of way on BLM-managed lands should be granted. This process includes compliance with the requirements of the National Environmental Policy Act and the Council for Environmental

2 attachments

ATTACHMENT #1

Toiyabe Chapter
P.O. Box 8096
Reno, NV 89507

April 20, 2006

Penny Woods
BLM State Office
PO Box 12000
Reno, NV 89520

Re: scoping comments for Kane Springs Valley Groundwater Development Project EIS

Dear EIS Manager Woods,

On behalf of the Toiyabe Chapter of the Sierra Club and its over 6,000 members in Nevada and the Eastern Sierra, we are submitting detailed scoping comments for the environmental impact statement on the proposed Kane Springs Valley Groundwater Development Project (EIS). This eastern Nevada groundwater pumping and pipeline proposal is of great concern to the Sierra Club because of our decades of experience with the catastrophic environmental and socio-economic impacts of LADWP's water exportation program from Owens Valley, CA. We incorporate by reference into our comments the scoping comments of the Great Basin Water Network, the Spring-Snake Valleys Citizens Alliance and the Northern Snake Valley Water Alliance. And we request an extension of the deadline for scoping comments, because of the lack of information provided on the proposed project and the lack of a BLM process to assess cumulative impacts of over 8 related pump and pipe project proposals in the carbonate aquifer region of eastern Nevada and western Utah. Our initial procedural and substantive scoping comments follow:

I. PROCEDURAL ISSUES:

A. Project Description :

1. Piecemealing NEPA: NEPA requires that the BLM consider actions that are similar or connected in one EIS. Yet none of the Southern Nevada Water Authority's (SNWA) pipeline projects are included in the project description. Omitted are proposed SNWA pipelines to Las Vegas from 3 Lakes/Tikaboo Valleys in western Nevada, Coyote Springs pipeline for test pumping ordered by the Nevada State Engineer, the Virgin and Muddy Rivers pipelines, and from Railroad Valley in Nye County where SNWA has additional water rights applications. These are the SNWA proposals we know about. In addition, BLM has initiated scoping on a Vidler Water Co./Lincoln County Water District (Vidler/LCWD) pipeline to the LCLA area

Response to Comment No. 10-8 Cont.
Quality regulations, BLM planning regulations, manuals and handbooks, and applicable policy documents. During scoping, and subsequent public comment periods, the BLM considered comments received alternatives to be analyzed in the Draft EIS. All comments received were systematically reviewed by an interdisciplinary team of resource specialists from various BLM offices, representatives from cooperating agencies, and BLM's EIS consultants

north of Mesquite. Coyote Springs Investment (CSI) has applied to transfer nearly 75,000 acre feet per year (AFY) from Geyser Ranch to Coyote Springs, a conveyance which will require the construction of another pipeline or the use of the SNWA pipeline. In addition, there is another pipeline proposal by the Clean Water Coalition at Lake Mead dealing with waste water and a SNWA proposal on the water supply pipeline from Lake Mead. We have asked the BLM how it will do a cumulative impacts analysis of all of these related pipeline projects, but have received no indication of how the agency will comply with this NEPA requirement.

RECOMMENDATION: The BLM must reconsider the project scope and determine whether a programmatic EIS must be prepared on all related water pipeline proposals or disclose the way the BLM will be able to do a cumulative impacts analysis of all the related projects.

2. Missing information on utility corridors: The Lincoln County Act authorized utility corridors in Lincoln and Clark Counties for water pipelines and related facilities. Maps of these utility corridors were not available in the BLM scoping packet nor provided at the scoping open houses in Nevada. The Club nor the public were able to examine the utility corridor maps to determine if the proposed ROWs, alternative pipeline alignments and related facilities are in the corridor or not. Maps available at the BLM website are at a 1:1,000,000 scale with the corridor lines on the map covering hundreds of feet, not comparable to the pipeline routes in the BLM scoping package. A reviewer cannot tell if the Vidler/LCWD ROWs and related facilities are within the utility corridor or not.

RECOMMENDATION: Maps at the same or smaller scale as maps in the BLM scoping package should be available overlaid with the Congressionally designated utility corridors at additional scoping meetings and on a working website, to provide the public full access to this critical information.

3. Missing information on project facilities: The Lincoln County Act states that the Secretary of Interior shall grant to the Lincoln County Water District nonexclusive rights-of-way to federal land in Lincoln County, Nevada, for any roads, wells, well fields, pipes, pipelines, pump stations, storage facilities, or other facilities and systems that are necessary for the construction and operation of a water conveyance system. Such facilities would include arterial water pipelines and secondary feeders and transmission lines. But all other permitted facilities are not included in the project description, so how can their impacts be analyzed in this EIS?

4. Project description: What is the footprint of the CSI project supported by the exported ground water? At full build-out? at 50% buildout? at buildout supported by 5000 af/y of (unapproved) ground water from Kane Springs Valley? How many units of residential, commercial and other development are projected by CSI? Golf courses? Very little information about the CSI development proposal, the recipient of the exported groundwater was provided during the scoping process by the BLM.

RECOMMENDATION: BLM must re-issue the project description and re-initiate the scoping process with more complete project information.

5. Project area: The scoping package appears to limit the "project area" to Kane Springs Valley. This is not acceptable. Pumping from the carbonate aquifer may affect all areas

downsystem as well as upsystem areas in NV and Utah. The project area should include southern White Pine County, Utah counties along the NV/UT border, and all of Lincoln County as well as eastern Clark County.

B. Project Timing:

1. While Congress in the 11/30/04 Lincoln County Act required the USGS study of the carbonate aquifer to be completed in 30 months and the BLM to comply with NEPA requirements before issuing any ROWs for pipelines and related facilities, it did not set a timeframe for BLM to complete its environmental analyses. Yet BLM has initiated scoping and is planning on completing this EIS before the USGS can complete the Congressionally mandated water study. We question why BLM is rushing the EIS process in the absence of the USGS BARCASS information? Does the BLM and the project proponent want the environmental analysis to be done without the best possible information mandated by Congress? Does BLM intend to duplicate the USGS efforts in collecting existing hydrological information on the carbonate aquifer in White Pine, Lincoln, and Clark Counties, as well as other affected counties in Nevada and Utah?

RECOMMENDATION: BLM should use the 36 months of the BARCASS study, which is well underway, to collect baseline hydrologic and other resource information, in cooperation with the USGS and cooperating agencies, of the total project area, including data from pump tests if such tests can be agreed on by Nevada and Utah counties as well as the Nevada and Utah State Engineers. Scoping should be reinitiated when this data is available.

C. Technical Data/Model Use:

1. In the absence of the hydrological data mandated by Congress in the Lincoln County Act, the BLM must rely on published data on water and biological resources as well as on the proponent's groundwater data and models which we understand are not intended or suitable for the analysis of environmental impacts required by NEPA. Has the project proponent collected data on hydrology and biological resources and developed a groundwater model on which the EIS analyses will be based? Have the data and models been published or peer reviewed? Are the data and models available for public review? Has the groundwater model ever been calibrated or ground-truthed? EISs are public documents which must disclose the environmental impacts of proposed actions. BLM cannot use unpublished and unreviewed data in the very public EIS process.

RECOMMENDATIONS: The BLM must assemble a science team which evaluates the schedule currently envisioned to determine if it is scientifically feasible to answer critical questions of impacts from water export on people and wildlife. The BLM must disclose the names and qualifications of government, private and contractor scientific reviewers so that the public can determine the independence of the panel assembled to review the science of the EIS. The BLM must provide for complete disclosure of all hydrologic and other resource data used in the preparation of the EIS, using the web for public review as data and model results become available. The BLM must provide for a peer review of all data and methods for collecting the data as well as for all models used in the EIS. The BLM must provide a peer reviewed, scientific evaluation of the uncertainty in both the data used and models and scientific methods used to calibrate the models. The BLM must include a peer reviewed, scientific evaluation of the impacts of the proposed groundwater pumping for at least 100 years, as impacts of groundwater pumping and export over such a large area of the carbonate aquifer may take time to become evident.

D. Project Alternatives:

1. NEPA requires a full range of alternatives to be analyzed in the EIS. The No Action must be more than pro forma and simply dismissed by BLM. One alternative should include all of the current related water projects in the carbonate aquifer (See I.A.1 above). Another should take a hard look at the other water supply options for the proposed Coyote Springs development. These should include: groundwater from other sources than Kane Springs Valley. The range of alternatives should include full build-out, 50% buildout and a development limited by actual water rights approved by the NV State Engineer.

E. Cumulative Impacts Analysis:

1. NEPA requires a cumulative impacts analysis in EISs. There are at least nine current pipeline proposals in eastern and southern Nevada. See I.A.1. above for the detailed list. Impacts on the downsystem as well as upsystem areas of the carbonate aquifer could occur in northern Nevada and Utah, as well as other Colorado River states. When we have asked the BLM how it intends to do a cumulative impacts analysis in 9 individual EISs of these related projects, most pumping and exporting groundwater from the carbonate aquifer, we have received no information on how such an analysis is even possible.

RECOMMENDATION: The BLM must reconsider its piecemeal approach to NEPA in preparing individual EISs for water pipeline projects in the carbonate aquifer and related pipeline projects in eastern and southern Nevada. One programatic EIS which looks at the potential impacts of all of the projects in the entire carbonate aquifer system is necessary, with individual EISs which study environmental impacts of pumping and exportation in specific basins would comply with NEPA far better than the current fragmented approach.

F. Open and Public Process:

1. We applaud the BLM for its public commitments to an open and public EIS process for these controversial and highly technical project proposals which could seriously affect so many rural and urban residents as well as dozens of TES species dependent on carbonate aquifer springs. Adding a scoping open house in Baker is commendable. Unfortunately, the BLM website may be down through the EIS process, through no fault of the NV or Ely BLM offices. In addition, this EIS involves highly technical hydrological issues associated with the carbonate aquifer about which little is scientifically known. And much hydrological and other resource data as well as the hydrologic model have been collected and developed by the project proponent, has not been peer reviewed, and is not accessible to the public. It is not clear how the BLM will coordinate protection of federal interests in public lands and resources among BLM field offices in Nevada as well as in Utah.

RECOMMENDATIONS: The BLM should use only public data and models in the EIS preparation. All data and models used in the EIS should be peer-reviewed and disclosed on a working website for public review, long before the draft EIS is written and released. Additional science briefing meetings should be held for the public after the BLM's science team (see I.C. recommendations above) has examined existing data and models and made its recommendations on their adequacy, reliability and usefulness to the EIS as well as on the proper schedule for EIS completion. The public should be allowed to present its input to the BLM on these technical issues after review of the science team's recommendations. The EIS contractor should be closely supervised by the BLM and remain totally neutral throughout the EIS process. The BLM must set up a coordinating process with both NV and UT state and field offices.

G. BLM Supervision of EIS contractors: The Ely BLM is currently preparing 7 EISs, a heavy workload. And other EISs are soon to be initiated. This EIS being rushed, without the benefit of the USGS BARCASS study of the carbonate aquifer. The EIS contractors are paid by the project proponent, not the BLM, and are under no obligation to comply with NEPA requirements, as is the BLM. But EIS contractors will be under considerable pressure to keep to the published EIS schedule regardless of the adequacy of the scientific data and necessary impacts models.

RECOMMENDATION: The BLM must consider the recommendations of the science team and make the decision, after another opportunity for public review and input, on whether to incorporate the USGS BARCASS data into the EIS, even if the schedule for completion is delayed.

II. SUBSTANTIVE ISSUES:

A. Water Resources:

1. What are the current surface and groundwater uses for irrigation, domestic and municipal uses, and springs, seeps, creeks, rivers, and wetlands in the project area and how much water is used?

2. What are the sources of water for these uses?

3. What are the private and tribal water rights in the project area? What are the federal and state water rights in the project area?

4. What are the vested water rights in the project area?

5. How much groundwater is stored in the carbonate and alluvial aquifers in the basins in the project area?

6. What are the recharge and discharge areas and rates for alluvial and carbonate aquifers in the project area?

7. What are the connections between the carbonate and alluvial aquifers in the project area?

8. How does groundwater flow through the carbonate aquifer, where, and at what rates in the project area?

9. How does geology, including faults, impervious layers, and other factors, affect the groundwater flow through the carbonate and alluvial aquifers, recharge and discharge areas and rates in the project area?

10. How much groundwater flows from Nevada into Utah and at what rates and locations in the project area?

11. How much groundwater flows from Utah into Nevada and at what rates and locations in the project area?

12. What will the drawdowns of the groundwater table and existing wells and springs be from various levels of groundwater pumping and exportation by Vidler/LCWD in the project area and the entire carbonate aquifer area)?

13. How much of the Kane Springs Valley ground water flows into the Colorado River?

14 How long will it take for Vidler/LCWD pumping/exporting impacts to occur to existing users and springs in the project area and the entire carbonate aquifer? At 5, 10, 25, 50, and 100 year intervals?

15. What are the effects of proposed groundwater pumping on upsystem areas? How will pumping affect the head and storage of water upsystem? At what pumping rates will flows be reversed? Where?

16. What are the effects of Vidler/LCWD pumping/exporting of groundwater on the quantity and distribution of surface water? On existing users of surface water?

17. What are the effects of Vidler/LCWD pumping/exporting of groundwater on surface water quality?

18. What is the current water quality of groundwater in the project area? At what pumping rates will saltwater incursions occur? Where?

19. Will pumped groundwater need to be treated by Vidler/LCWD or CSI to meet water quality standards for M&I uses in Coyote Springs Valley?

20. How will exported groundwater be introduced into CSI's existing water delivery system?

21. What baseline information is available on spring flows in the project area and what additional information is needed before the Vidler/LCWD pipeline project is implemented?

22. What are the current sources of water for urban M&I uses in Coyote Springs?

23. What are the anticipated water conservation programs in Coyote Springs and how much water will be conserved?

24. What other water supply options for Coyote Springs Valley are being currently pursued by CSI?

B. Socio-economic issues:

1. What impacts will the proposed project including at full build-out have on rural communities, businesses, families and lifestyles, values, populations, and economies, both current and future in Lincoln, White Pine, Nye, Clark Counties, Nevada, and Tooele, Juab, Millard, Iron, Beaver, and Washington Counties in Utah?

2. Do these rural counties and areas have adequate financial resources to protect their interests in the EIS process?

3. What impacts will the proposed project have on these rural county and area governments, budgets, services needed and ability to deliver, revenues and costs, schools, courts, fire and public safety services, emergency services, health care, roads, parks, taxes, real estate values, hospital overall quality of life, etc. for the very remote Coyote Spring Valley development?

4. What impacts will the proposed project have on aesthetic values of these rural areas?

5. What impacts will the proposed project have on rural tourism and recreational opportunities?

6. What impacts will the proposed project have on rural air quality?

7. What impacts will the proposed project have on current and future growth in rural Nevada and Utah counties?

8. What impacts will the proposed project construction and the new residents who would be supported by exported water have on rural counties, on traffic impacts on Hwy. 93 and I-15?

9. How much will the proposed Vidler/LCWD project cost? Costs should include any financing costs and the time period for repayment.

10. Who will pay these costs?

11. What impacts will the proposed project and its new residents have on Nevada urban county and city governments, budgets, services needed and ability to deliver, revenues and costs, schools, courts, fire and public safety services, emergency services, health care, roads, parks, taxes, real estate values, crime, traffic problems, overall quality of life, etc.

12. What impacts will the proposed project have on the aesthetic values of Nevada rural areas?

13. What impacts will the proposed project have on urban tourism and recreational opportunities? Many Las Vegans currently hunt, fish, camp, and hike in Lincoln and White Pine Counties, but may lose these recreational opportunities if state and federal parks and wildlife areas are dried up or damaged by falling water tables from Vidler/LCWD pumping/exporting.

14. What impacts will the project have on urban air quality? Las Vegas is already out of compliance with many federal and state air quality requirements. Will air pollution be worse with commute traffic from Las Vegas to Coyote Springs during construction and afterwards?

15. What impacts will the proposed project have on current and future growth in urban Nevada and Utah? Will ground water for the Coyote Springs development reduce potential water supplies for Las Vegas and other Clark County communities?

16. Does Vidler/LCWD's need for additional M&I water to support leapfrog growth in Coyote Springs Valley outweigh rural values and ways of life currently supported by rural water supplies from the carbonate and alluvial aquifers in eastern Nevada and western Utah?

17. What impacts will the proposed project have on Native American tribes in eastern and southern Nevada, and west Utah?

C. Wildlife/Wildlife Habitat

1. What impacts will the proposed project have on resident wildlife species populations and habitats?

2. Lincoln County provides excellent habitat for Sage Grouse, a declining species in the west. Sage Grouse Conservation Plans have been developed for Population Management Unit areas in Lincoln County. What impacts will the proposed project have on Sage Grouse and on its habitat in NV?

3. Sage Grouse also live in sagebrush areas in west Utah. What impacts will the proposed project have on Utah Sage Grouse and its habitat?

4. What impacts will the proposed project have on fish species, populations, and their habitats in the project area?

5. NDOW is currently developing a comprehensive conservation strategy for wildlife in Nevada. How will the proposed project affect the conservation strategy, especially on the need to provide water-based habitats for Nevada fish and wildlife, in eastern and southern Nevada?

6. Fishing, hunting, birdwatching, camping, touring, and nature photography are popular recreational uses in eastern and southern Nevada, with campgrounds at state parks, wildlife areas, and BLM rec. areas filled nearly every weekend. What impacts will the proposed project have on these recreational uses?

7. Migratory bird species rely on watered areas in eastern and southern Nevada for resting and refueling. What are the migration corridors and oasis areas? What impacts will the proposed project have on migratory birds there?

8. Resident bird species also depend on habitat in eastern and southern Nevada. What areas are important for birds? What impacts will the proposed project have on important bird areas?

9. Riparian areas are critical to the survival of wildlife in the project area. What impacts will the proposed project have on riparian areas?

10. The use of key species in the EIS is not acceptable, as it omits environmental impacts analysis of the vast majority of fish and wildlife species, all of whom are at risk from the loss of

habitat from large-scale, regional groundwater pumping and exportation.

RECOMMENDATION: The BLM must conduct a thorough analysis of environmental impacts to fish and wildlife in the project area instead of using the inadequate "key" species approach.

11. What alternative would have the least negative impacts on fish and wildlife and their habitats in eastern and southern Nevada and western Utah?

D. Special Status Species

1. Eastern and southern Nevada have the highest biodiversity in the state and Nevada ranks second in biodiversity in the US. Much of this biodiversity is linked to springs, creeks, lakes, wetlands, and rivers, most of which scientists believe are supported by the carbonate aquifer in this arid desert region. What impacts will the proposed project have on the region's biodiversity?

2. There are dozens of federally listed, proposed and candidate species and BLM and State sensitive species, along with their habitats, in the project area, especially the threatened Desert Tortoise. See www.heritage.nv.gov for the entire list. What impacts will the proposed project have on each of the TES species in the project area in Nevada and Utah?

3. What impacts will the proposed project have on the ecological integrity of ecosystems in eastern and southern Nevada, and west Utah?

E. Other Environmental Impacts

1. What impacts will the project have on fire frequency and occurrence as groundwater pumping dries up vegetation over large areas of desert valleys in eastern and southern Nevada and in Utah?

2. What impacts will the proposed project have on soils, crusts and vegetation communities in the project area, including west Utah?

3. What impacts will the proposed project have on the invasion and spread of noxious weeds, especially from soil-disturbing construction activities and long-term vehicle and road use in maintaining facilities, in the project area?

4. What impacts will the proposed project have on livestock grazing and ranching operations?

5. What impacts will the proposed project have on the health of watersheds in the project area in Nevada and Utah?

6. What impacts will the proposed project have on air quality in the project area? Will toxic dust storms similar to those on Owens Lake, California, be created in areas of vegetation dying from groundwater table decline?

7. Will the proposed project, especially in the construction phase, mobilize radioactive dust in disturbed soils deposited by above-ground nuclear testing at the Nevada Test Site and elsewhere

in Nevada decades ago? Will cancer rates increase in downwind areas from the proposed project construction activities?

8. How will the proposed project impact wild horses and their habitat areas, including scarce desert watering holes and springs on which horse survival depends?

9. How will the proposed project impacts existing rights-of-way uses (other pipelines, telephone and power lines, etc)?

10. Eastern Nevada and western Utah are rich in caves, especially in the widespread limestone formations. What impacts will the proposed project have on existing caves and cave formations in the project areas? On bat species utilizing caves?

F. Cultural Resources

1. Native Americans occupied eastern and southern Nevada and west Utah for thousands of years. How will the proposed project impact Native American cultural resources and sites?

2. What impacts will the project have on paleontological resources?

3. What impacts will the project have on petroglyphs and pictographs in the project area (e.g. increased vandalism of cultural sites)?

G. Special Land Areas

1. There are a number of National Parks in the project area. What impacts will the proposed project have on Great Basin and Death Valley National Parks, and on Lake Mead National Recreation Area? What are current and projected levels of park visitors? What impacts will the proposed project have on each national park area, including loss of water, increasing erosion, and increased or decreased visitor use, need for and cost of park management and facilities, etc.?

2. State Parks in the project area include Cathedral Gorge, Beaver Dam, Echo Canyon Reservoir, and Kershaw Ryan, and in southern Nevada include Valley of Fire, Floyd Lamb, Spring Mountain Ranch. What impacts will the proposed project have on each state park, including loss of water, increasing erosion, and increased or decreased visitor use, need for and cost of park management and facilities, etc.?

3. Eastern and southern Nevada and west Utah are the sites for some unique and valuable National Wildlife Refuges, including Ash Meadows, Fish Springs, Desert, Pahranagat and Moapa Valley NWRs. Most are water-based and contain a large number of endemic species. What impacts will the proposed project have on each refuge?

4. Nevada has established a number of State Wildlife Management Areas in the project area, including Key Pittman, Wayne C. Kirch, Railroad Valley and Overton WMAs. What impacts will the proposed project have on each WMA?

5. BLM has some outstanding natural areas, ACECs, and recreational areas on public lands in the project area: 3 Desert Tortoise ACECs, the swamp cedars in Spring Valley, Red Rock

National Conservation Area, mesquite natural area near Pahrump, and a number of wilderness areas and wilderness study areas. What impacts will the proposed project have on each special BLM areas?

H. Public Access

1. The proposed pipeline will follow the main road into Kane Springs Valley, access to public lands used lightly or very heavily for a number of purposes. Access will be disrupted during the construction period and perhaps afterwards by security needs. What impacts will the proposed project have on public access to public and private lands during and after pipeline construction?

J. Security Issues

1. The proposed pipeline and related facilities, such as well-fields, pump stations, etc. have security needs in this post-911 era. Yet no such security measures were disclosed in the scoping process. Will large areas be fenced? Will the buried pipeline be fenced? Surveillance cameras? Armed security patrols of the pipeline corridor and other facilities? Closed areas? Closed roads? What impacts will security measures for the proposed project have on public use and enjoyment of public lands?

K. Monitoring

1. What monitoring is necessary to determine impacts from Vidler/LCWD groundwater pumping on public lands and resources? On existing water users? On TES species? On national and state parks, wildlife areas, and BLM special areas?

2. How often must monitoring be done?

3. What kinds of monitoring must be done? Electronic? Site visits?

4. Who will be responsible for monitoring?

5. Who will pay monitoring costs?

6. How will monitoring data be published for public review?

7. Who will evaluate monitoring data to determine the severity of impacts?

8. Will the BLM set impact thresholds beyond which pumping must be reduced or stopped?

9. What are acceptable and unacceptable impacts?

10. What happens if monitoring is not done by the responsible parties?

11. Can BLM withdraw the ROW permit for the pipeline if monitoring indicates unacceptable impacts in the basins losing water?

12. Who is responsible for monitoring impacts on TES species?

13. What are acceptable and non-acceptable impacts for TES species?

L. Mitigation

1. What is acceptable mitigation for declining water tables which affect wells, springs, wetlands, creeks, lakes, rivers?

2. What is acceptable mitigation for the loss of vegetation, increased erosion and air pollution from dust storms?

3. What is acceptable mitigation for economic losses by ranchers, farmers, small businesses, local and tribal governments?

4. What is acceptable mitigation for loss of population, opportunities for growth in rural communities, and rural quality of life?

5. What is acceptable mitigation for urban impacts of additional residents on urban and rural schools, parks, health and safety, crime, infrastructure and other government costs, employment/unemployment, taxes, real estate values, and quality of life?

6. What is acceptable mitigation for the loss of wildlife populations and habitats from project impacts?

7. What is acceptable mitigation for the loss of or severe impacts to TES species and their habitats?

8. Who sets mitigation requirements?

9. What are the costs of required mitigation?

10. Who pays mitigation costs?

11. Who enforces mitigation requirements?

12. How will mitigation be triggered?

13. How will adverse impacts on affected springs from pumping in Kane Springs Valley be determined when other carbonate aquifer wells will also be operating in the same part of the flow system?

M. Other: the Lincoln County Land Act Development and Wilderness Act of 2004 required an agreement be reached between Nevada and Utah on shared carbonate aquifer water before any groundwater would be transported through pipelines on public lands. Why is this EIS being started before there is any discussion or agreement between the two states on shared ground water?

In conclusion, the Sierra Club requests the BLM extend the scoping period while developing a more accurate and comprehensive project description including all related pipeline projects, while establishing a science team, while the science team reviews existing data and models to be used in the EIS and makes recommendations on the adequacy and/or need for additional hydrological, biological, and other data and/or models for the impacts analysis and cumulative analysis, while the public reviews these science team recommendations, and while BLM determines whether the initial EIS scoping schedule is too short for the public to be able to adequately provide scoping issues and for the BLM to do a credible job of studying the environmental impacts, especially the cumulative impacts of related water exportation project proposals.

Thank you for considering our initial scoping comments. We will submit additional comments as more information becomes available on this controversial project proposal.

Sincerely,

/s/

Rose Strickland
Toiyabe Chapter of the Sierra Club

ATTACHMENT #2

Toiyabe Chapter
P.O. Box 8096
Reno, NV 89507

April 24, 2006

Penny Woods
BLM/NV State Office
PO Box 12000
Reno, NV 89520

Re: additional scoping comments for Kane Springs Valley Groundwater Development Project EIS

Dear Ms. Woods,

These are additional scoping comments for the environmental impact statement on the proposed Kane Springs Valley Groundwater Development Project (EIS), supplementing the initial written comments of April 20, 2006 and oral comments at scoping meetings. We again request a 309 day extension of time for scoping comments. There is much missing information on this project which has not been supplied by the BLM including our requests for additional information on the vague project description, for hydrological and biological data and models to be used in the EIS and any idea of how BLM will be able to conduct a cumulative impacts analysis on this and other related water pipeline proposals in the carbonate aquifer area.

We do not know if the Bureau is setting up a technical team to review existing data, or a "science team" to address the complex hydrological and biological issues involved in these multiple pumping projects in the carbonate aquifer area.

Will the Nevada Department of Wildlife be a cooperating agency in the EIS process? Without NDOW, the BLM and its technical team will be greatly impacted in its ability to address wildlife impact issues. We urge the BLM to negotiate an agreement with the State of Nevada, so that NDOW can fully participate on the technical team for the EIS.

The Sierra Club does have additional scoping comments, however, and submit the following to supplement our initial letter.

I. ADDITIONAL PROCEDURAL ISSUES

A. Project Description

1. Additional information needed:

a. What is the timing of the groundwater pumping? Different levels of pumping annually may have different environmental impacts, both in amount and timing. Pumping during a drought may exacerbate impacts.

b. The project description should identify the regional flow systems and the groundwater basins from which water would be pumped, as well as the source of water - alluvial, carbonate or other aquifers or surface water.

c. The project description should identify the dates and locations of well applications and af/y amounts of water expected, as well as the status of any other water rights in the project area, whether Vidler Water Co./Lincoln County water District (Vidler/LCWD) has any certificated water rights, etc. in each groundwater basin in the project area.

d. What is the estimated perennial yield in each of the groundwater basins in the project area? What is the estimated sustainable or safe water use in each basin? Who would determine safe water use in each basin? Will the hydrological model used in the EIS assume that the regional flow systems and groundwater basins are currently "in-balance" where "input equals output?"

e. What are the vested water rights in the project area? Will they be harmed by the pumping proposal?

2. Inadequately defined project area: Why were hydrological basins adjacent to those planned for direct groundwater development, but within the larger regional flow systems (Death Valley, White River, and Great Salt Lake Regional Flow Systems) not included in the project area? We challenge the implied assumption that neighboring basins will not be affected, either hydrologically or biologically, by proposed groundwater pumping and exportation.

RECOMMENDATIONS: All groundwater basins within the 3 larger regional flow systems be included as a part of the project study area. In addition, since many basins in White Pine County and Lincoln County and Utah are in the adjacent Colorado River Regional Flow System and targeted for groundwater development by other water purveyors in the near future, we strongly urge that the project area be expanded to include all basins in the Colorado River Flow System in both states. And, lastly, the EIS should examine why Las Vegas cannot obtain more Colorado River water - the "rationale" for the proposed in-state groundwater development proposal.

3. Missing NEPA requirements: Additional NEPA rules were published in the Federal Register of March 8, 2004, requiring the BLM to use consensus-based management and community-based NEPA training in the EIS process. These were not included in the BLM scoping package for the EIS. The purpose of the new rules is to maximize public participation in the NEPA process, especially early public input.

40 CFR 1501.2) "It is imperative that bureaus enlist the participation of all interested parties as early as possible and provide any necessary community-based training in order to reduce costs, prevent delays, and to promote efficiency in the NEPA process. It is the intent of these procedures to achieve early consensus on the scope of NEPA compliance and the methodologies for collecting needed baseline data...Further, it is the intent of these procedures to facilitate environmental analyses that avoid the late introduction of issues and alternatives that should have been identified initially during scoping."

RECOMMENDATIONS: We urge the BLM to continue scoping for this EIS while vigorously implementing 40 CFR 1501.2. The inclusion of NDOW in the EIS process is essential, so BLM should resolve any administrative issues preventing NDOW's participation.

B. Project Timing

1. BARCASS STUDY: We have recently learned that Phase II of the BARCASS study would take an additional three years and $6M to complete. This study would utilize the groundwork being laid in the Phase I study to develop a predictive model of impacts from pumping from the carbonate aquifer.

RECOMMENDATION: BLM should use the predictive model developed in the BARCASS Phase II study for assessing impacts of the proposed federal action. It is the only third-party, independent model which will be available on which BLM can base the critical impacts assessment.

2. Baseline Data Needs: BLM cannot conduct an impacts assessment or a cumulative impacts analysis without adequate baseline data on existing conditions, before groundwater pumping is initiated.

RECOMMENDATIONS: Using independent and peer-reviewed data collection methods, the BLM and other local, state, and federal government agencies, private

water users, and the project proponents should collect the following baseline data in the project area in Nevada and Utah:

- **water rights status, including recorded water rights, vested water rights, applications for water rights in the project area,**
- **water rights needed for reasonable expectations of local growth,**
- **historical and current water uses,**
- **mapped locations of all springs and seeps, on both public and private lands,**
- **mapped locations of wet meadows and other areas with water-dependent flora and fauna,**
- **test wells for assessing the connectivity between alluvial groundwater and the deeper carbonate-rock aquifer groundwater and for assessing the recharge rates of both aquifers.**

C. Technical Data/Model Use

1. Public participation in technical issues: The Sierra Club endorses the 3 recommendations made by the Northeastern Great Basin Resource Advisory Committee regarding public participation in the pipeline EIS:

RECOMMENDATIONS:

a. The BLM should base its EIS on the hydrological data results from the USGS BARCASS study of the carbonate aquifer before judging NEPA disclosure and analysis to be adequate and complete.

b. The BLM should provide for regular public update and comment on technical issues deliberated in closed sessions of the "technical team." Public outreach could include by:

1. **providing web-enabled interactive public discussion on technical topics**
2. **maintaining a website containing technical documents and transcripts of closed meetings**
3. **hosting open public meetings on technical issues shortly after each closed technical meeting**

c. The BLM should implement a mechanism for meaningful involvement by local governments denied Cooperating Agency Status.

2. Model: BLM should disclose, ASAP, the hydrological and biological data and the assumptions underlying any models used in the EIS process.

D. Project Alternatives

1. There are no alternatives proposed in the scoping documents, unlike other BLM scoping packets on proposed projects. This is a deficiency in BLM compliance with NEPA requirements.

RECOMMENDATION: The EIS must contain a range of actual alternatives to the

proposed action. These should include a no action alternative and alternatives with various levels of Coyote Springs development buildout. Minimization and mitigation strategies and best management practices should be included in each alternative.

2. Water conservation alternative: Enclosed is a report from the Rocky Mountain Institute of a conference in Las Vegas in which methods to achieve per capita use levels of 50 gal/person/day were discussed with developers. A water conservation alternative in the EIS for the Coyote Springs development should include all reasonable and implementable practices and policies to achieve reduced water demand, including indoor conservation (toilet retrofit programs, increased appliance efficiencies, and programs directed at tourists staying in motels and hotels and visiting casinos, restaurants, golf courses, and other water-using facilities.

3. Reduced groundwater pumping alternative: What is the minimum amount of groundwater necessary to make the proposed project economically feasible?

II. SUBSTANTIVE ISSUES:

A. Water Resources

1. Utah: What water resources in Utah could be impacted by groundwater pumping in Nevada? Please quantify the impacts, including amounts and timing.

2. National Forest Lands: What water resources on National Forest lands in Nevada and in Utah could be impacted by groundwater pumping in the project area, including springs, wetlands, riparian areas, creeks, and caves, especially those dependent on seeping groundwater to create or maintain cave formations?

3. Recharge Rates: Will recharge rates for the carbonate alluvial aquifers be affected by changes in vegetation cover, i.e., losses of vegetation due to declining water tables from groundwater pumping and exportation?

4. Water quality: What impacts on water quality will the proposed pumping cause?

B. Socio-economic issues

1. Project costs: Estimates of project costs should include all costs, not just construction costs. These would include financing costs, monitoring and mitigation costs.

2. Takings: Consider whether the effects of project pumping which result in direct effects to existing water rights - lowering water levels in wells and creasing flows in springs and creeks - constitute a taking of individual property rights. Can Vidler/LCWD effectively condemn and take individual water rights in Nevada? outside Nevada in Utah?

C. Wildlife/Wildlife Habitat

1. Recommendations: The BLM should use wildlife conservation plans developed in Nevada and Utah for specific species, including Nevada's Comprehensive Wildlife Conservation Strategy, the Nevada Partners in Flight Bird Conservation Plan, and specific Sage Grouse Population Management Unit conservation plans in White Pine and Lincoln Counties, in the EIS process to assess the wildlife values, assess project wildlife impacts, and develop monitoring and mitigation in the project area.

D. Other Environmental Impacts

1. Ecosystem impacts: Pumping and removing groundwater from groundwater basins in the project area will have enormous impacts on ecosystems and ecosystem functions in both the Great Basin and in the Mojave Deserts, since current levels of water use are resulting in declining spring flows and levels in domestic and irrigation wells in the project areas.

a. Great Basin Restoration Initiative: The BLM has proposed actions to reverse declining ecosystem health in the Great Basin. How will the proposed action affect BLM's program goals and objectives?

b. RVDE: The USGS has announced a project, entitled RECOVERABILITY AND VULNERABILITY OF DESERT ECOSYSTEMS, which is designed to conduct basic scientific research on ecological processes within the Mojave Desert Ecosystem and to use this knowledge to provide land managers with scientific understanding and tools needed to conserve and restore threatened desert landscapes in the Mojave Desert. We request that the BLM incorporate this USGS project into the pipeline EIS process for the affected Mojave Desert groundwater basins.

E. Other Issues

1. Environmental Justice: The project area includes many low-income families both in rural areas and in urban areas.

a. Rural communities: A decrease in agricultural income from declining water levels in irrigation wells and springs and surface water and resulting increases in costs for deepening wells and/or pumping costs may have drastic effects on local county school district budgets and provision of community services and infrastructure. Please consider these impacts over the next 50 years if the proposed action is implemented.

b. Urban areas: Creating a new town in this remote area will require huge amounts of water. How much water will be needed at full buildout? 50% buildout and at a development level supported by actual approved water rights? How much will the water cost? Who will bear the costs? What water rates will be charged at Coyote Springs to purchase and transport water? To operate and maintain water systems?

2. Bonds:

RECOMMENDATION: With the uncertainty over the economic and environmental impacts of massive groundwater pumping and removal from Lincoln, White Pine and Utah counties as well as the costs of monitoring and mitigation over 50 years, the Sierra Club recommends that BLM require a bond in a substantial amount to cover these costs.

3. Nevada State Water Plan: How will the proposed project comply with or violate Nevada State Water Plan policies?

F. Mitigation

1. Interim plans for mitigation: Will mitigation for declining flows in springs which support TES species be immediate, rather than held hostage to lengthy legal proceedings about exactly whose groundwater pumping is causing the environmental harm?

2. Multiple state monitoring and mitigation: How will monitoring and mitigation be coordinated across 3 states potentially affected by the proposed groundwater pumping and exportation?

3. Public notification: How will BLM make public up-to-date reports on monitoring and mitigation for the proposed project?

Thank you for considering these additional scoping comments.

Sincerely,

/s/

Rose Strickland
Toiyabe Chapter of the Sierra Club

attachment

Rocky Mountain Institute Summer 2004

Green Development in the Desert
A Green Oasis of Refrigerated Plenty

by Will Clift

Whether one arrives in Las Vegas by plane or by car, one is struck by a stark contrast between the lushness of the city and the dryness of the desert that stretches in all directions.

Las Vegas is world-renowned as a city of fantasy, flaunting its reputation for excess—a green oasis of refrigerated plenty in the midst of a blazing desert. But dig a little deeper, and a harsh reality becomes evident: this is not an oasis, but rather a region that is exceeding its human carrying capacity. This is evidenced by the city's congested traffic, severe water shortages, expensive power, and dwindling amounts of developable land.

And yet, people keep coming. The real estate market is staggering; Las Vegas has consistently been ranked as one of the fastest-growing cities in the country for much of the last decade. Certain recently-completed developments have nearly sold out before a single house was finished. Area officials are now faced with two challenges. The first is how to reduce the rate at which Las Vegas consumes resources. The second is to create a model for development that allows the city to continue to grow, without increasing its burden on the area's resources.

Planners in the city's Comprehensive Planning Department are hoping to create this model in the Kyle Canyon Gateway development project, a 1,600-acre parcel of BLM land, seventeen miles northeast of downtown and the Strip, which will be auctioned to developers later this year. The city plans to place restrictions on its sale that will require the developers to address issues of sustainability. Multiple stakeholders, from developers to the Sierra Club, applauded this innovative approach. If the effort is successful, the city hopes to apply similar restrictions to all future developments.

Last November, RMI was asked to hold a *charrette* 1 to inform the city about what sustainable development in Las Vegas would look like, and how to make it achievable within the economics of the real estate market. In this project, RMI saw a potentially unique opportunity to address the thorny challenges faced in the Southwest.

"Addressing imminent growth in resource-overburdened regions is a real challenge for GDS." says Green Development Services team leader Alexis Karolides AIA, who led the charrette. "Is it possible to develop in a whole-system way that has an overwhelmingly positive, even a restorative, effect on the region? Could we create a community plan that not only avoided exacerbating the standard sprawl-and-waste pattern of development, but could instigate restorative retrofits (addressing such issues as water and energy efficiency, xeriscaped landscaping, waste reduction, etc.) *throughout the greater community* and start to heal the city's overall development pattern?"

Overburdened Natural Resources

Whether one arrives in Las Vegas by plane or by car, one is struck by a stark contrast between the lushness of the city and the dryness of the desert that stretches in all directions. While this contrast creates part of Las Vegas's allure, it also reveals the artificiality of its seeming abundance of life-sustaining resources.

Las Vegas has one of the highest per-capita rates of water consumption in the nation, at over 240 gallons per day. Last year the city's water supply, Lake Mead (itself artificial, created by Hoover Dam), dropped to its lowest level in more than three decades. Though appearances might suggest otherwise, the resort casinos are not the worst water wasters. Rather, the main culprits are private residences, which frequently have water-intensive amenities such as turf lawns and swimming pools.

Nevada's energy demand has greatly exceeded its production for many years, forcing it to purchase electricity from outside the state. Nevada's electricity users now often pay premium prices, especially during afternoon hours when the state is consuming electricity at the highest rates and every air-conditioner is on, creating an infamously sharp "needle peak." The inherent cost of that loadshape, plus exposure to the volatile power market during the California power crisis, recently forced the local utility, Nevada Power, to the edge of bankruptcy.

Developable parcels of land are in short supply in the Las Vegas area, as the suburbs have begun to run into the mountains, protected land, and other undevelopable areas. The Kyle Canyon Gateway development, for instance, is nestled between the Red Rock Canyon National Conservation Area, Floyd Lamb State Park, and the Paiute Indian Reservation. The limits to growth are readily apparent.

RMI's Whole-System Approach

RMI brought a multi-disciplinary team to Las Vegas, including experts in energy, water, transportation, green buildings, and urban and landscape design, explicitly to look across boundaries. Nearly seventy participants from the Las Vegas area joined them, including utility representatives, real estate agents, developers, and city officials. During the charrette, discussion cycled between specific topics and general ideas, as well as the connections between them.

Development with Minimal Resource Consumption

The immediate goal of a green development approach was to identify design methodologies that would allow growth (buildings and people) without increasing resource consumption. Because new development necessarily consumes resources, the development must either create enough of its own resources to cover the increase, or offset it with savings nearby. The participants applied this concept differently for different resources.

Energy: By installing renewable energy and distributed generation systems within Kyle Canyon Gateway, as much electricity can be generated as the development consumes over the course of a year. This would result in net-zero electricity consumption. In particular, charrette participants discussed the installation of a large solar photovoltaic (PV) array on a berm along a depressed arterial roadway. Such a PV system would have the advantage of generating the most power during the mid- to late-afternoon hours (the shoulder peak) when the area must import the most power.

Charrette participants also discussed energy efficiency opportunities, which are generally the least expensive way to reduce power imports and approach net-zero electricity consumption. Careful building design and the installation of energy efficient appliances such as washers, dryers, air conditioners, and light fixtures can cut peak electric loads and annual usage by upwards of 80 percent, as compared to a typical utility-certified "energy-efficient" house design. These savings can result in a win-win situation for both the utility and the customer. As RMI's Amory Lovins testified to the Public Service Commission of Nevada in 1985, such improvements could cut customer energy bills in half, at no extra construction cost, while saving the utility over $10,000 in capacity investments.

Water: Rather than focus on ways to offset new water consumption by reducing it elsewhere, charrette participants looked at ways to minimize water use in the development in the first place. The discussion spelled out practical ways to reduce the amount of water drawn from Lake Mead to a remarkable fifty gallons per person, per day—a nearly 80 percent reduction from the Las Vegas area average. Proven opportunities included capturing and using stormwater, allowing only native and drought-resistant plants in landscaping, and installing a dual-distribution water system. This system, akin to the fresh/brackish system already used in Salt Lake City which has two separate sets of piping, one for fresh water and one for recycled. All water for indoor use comes from the fresh water pipe. After it has been used in sinks, showers, washing machines and the like, it is cleaned in a nearby recycling plant and put into the second set of pipes. This recycled water is for the development's outdoor requirements, such as landscaping. This makes nearly 100 gallons per person per day available while drawing only fifty from Lake Mead. Another significant component of the reduction stems from the wide availability of water-efficient but high-performance plumbing fixtures, whose spread was in part catalyzed by RMI's 1980s publication of two influential industry-wide catalogues showcasing then little-known water-saving technologies that were becoming available.

Land: Building on any open land is ultimately an unsustainable practice, but good design can mitigate its negative effects. Views and access to nearby mountains and protected areas can be preserved by limiting building height and placement, maintaining open space within the development, and including an extensive network of trails to maintain links between surrounding areas. Additionally, by maintaining natural contours instead of leveling and filling them, natural water channels and animal pathways can be preserved, along with the distinctive character of the original landscape.

Creating Connections

During the charrette, RMI's multidisciplinary approach revealed several ways that a single element of green design could multiply value in ways often overlooked by traditional slice-and-dice design and budgeting processes. For example, every gallon of water saved is a gallon that does not need to be pumped 2,000 vertical feet and several miles from Lake Mead. This, in turn, will save significant pumping energy, whose value could offset the cost of efficient equipment or dual distribution systems.

Another example of compounding benefits arises by integrating transportation infrastructure from the start. By mixing residences with commercial buildings, developing a public transportation system, and building trails designated for alternative transportation (like bicycles and small electric vehicles), Kyle Canyon Gateway can realize diverse benefits. Fewer trips by car will mean less air pollution and less money spent on gas, as well as safer streets for pedestrians. Giving residents an opportunity to run errands and hold jobs locally will reduce traffic congestion there and in downtown Las Vegas, retain more money within Kyle Canyon Gateway's neighborhoods, and encourage interaction between residents, strengthening the development's sense of community.

What's Next

While RMI's work with Las Vegas and the Kyle Canyon Gateway development might seem a minor highlight in a long saga that mixes public- and private-sector interests, the underlying implications are much greater. Settlements in the desert Southwest are growing at an astounding rate. During 1990–2000, Nevada, at 66 percent, was the fastest-growing state in the nation, adding nearly a million people to the already heavily burdened desert. More citizens demand more housing, more roads, more energy, and more food—more than the overburdened environment and the aging infrastructure can provide.

Moreover, the western part of North America, from British Columbia to Chihuahua, has been experiencing a major seven-year drought that shows no sign of abating. The conflict between growth and preserving the natural environment has reached a critical juncture. How our society—the government, public and private firms, NGOs, and academic institutions—designs and governs growth in arid regions is of vital importance.

RMI's role is to define whole-system solutions that can cost-effectively reduce the impact of new growth to the level where it is sustainable—and then go beyond this to understand how we can restore our damaged environment. The public-private-NGO collaboration around Kyle Canyon Gateway may, we hope, become part of that emerging blueprint.

1Charrette: an intensive, interdisciplinary workshop that brings together stakeholders and experts at the very outset of a design or problem-solving process.

About the Author
Will Clift (wclift@rmi.org) is an associate with RMI's Research & Consulting group.

Jim and Mary Dale Deacon
<deaconj@unlv.nevada.edu>
07/08/2007 04:01 PM

To nvgwprojects@blm.gov
cc
bcc
Subject groundwater EIS

These comments are pertinent to both the SNWA Pipeline EIS and the Kane Springs EIS.

Comment No. 11-1

In my scoping comments regarding the SNWA Pipeline EIS, I emphasized the importance of evaluating cumulative effects of the project. Water to be conveyed by the SNWA pipeline project will be pumped from a number of valleys throughout eastern, central, and southern Nevada. Groundwater throughout the entire area is integrated to a considerable degree by a regional aquifer referred to as the Deep Carbonate Aquifer. The recent study completed by USGS referred to as the BARCAS study reports that the degree of integration throughout the area investigated is even greater than previously understood. By implication, that result suggests that integration of the Deep Carbonate Aquifer with the many valley fill aquifers throughout the region is also likely to be greater than previously understood. For that reason it is essential that both the SNWA Pipeline EIS and the Kane Springs Pipeline EIS evaluate cumulative effects that both of those projects are likely to have on the regional aquifer and the regional springs, wetlands, and phreatophyte communities supported by that aquifer. In order to assist you with that evaluation, I attach herewith a manuscript (Word document) recently accepted for publication in Bioscience, and illustrations to be published along with that manuscript (PowerPoint file) in their September issue. While the publication will be available to you before completion of your draft EIS, I submit it now for your consideration in order for you to have a couple of months head start on its use. Should you find it useful, I would also be happy to supply you with lists of species likely to be adversely affected as a consequence of the cumulative effects of the many proposed groundwater pumping projects in the region.

It is important to understand that this evaluation represents a very conservative evaluation of probable long-term effects of the several projects to which I refer. Specifically in making the evaluation, we circumscribed the potential area of impact by reference to a USGS water resources paper by Schaefer and Harrill (1995) which made the basic assumption that the SNWA water project would be the ONLY source of groundwater removal in the region! That assumption is obviously excessively conservative. Our analysis demonstrates that if water rights in the region that existed as of February 2006 were to be maintained and the SNWA project were added to those rights, and no other rights are granted subsequent to February 2006, the SNWA project would be responsible for approximately 25% of the total groundwater removed from the region. On the other hand, if all of the applications submitted as of February 2006 were granted, and the SNWA applications were limited to 180,800 acre-feet per year, SNWA would be responsible for removing approximately 10% of the total groundwater removed from the region.

I hope you find these comments, and this manuscript useful in your analysis of probable impacts.

James E. Deacon

Response to Comment No. 11-1

BLM appreciates your comment. The manuscript and illustrations that you provided will be included in the administrative record.

Jim and Mary Dale Deacon
<deaconj@unlv.nevada.edu>

08/20/2007 11:30 AM

To nvgwprojects@blm.gov
cc
bcc
Subject comments regarding Kane Springs draft EIS

The following comments are submitted as my response to the Kane Springs draft EIS.

Comment No. 11-2

1. Scoping comments requested that BLM examine all impacts of the proposed transfer of 1000-5000 acre feet of ground water from Kane Springs Valley to Coyote Springs Valley. The draft EIS examines only potential to environmental effects of pipeline construction. You have not examined the effects of groundwater withdrawal or of construction of the city made possible by importation of that groundwater. In view of the fact that both groundwater withdrawal and city construction have a high probability of adversely affecting the endangered Moapa Dace, the threatened desert tortoise, and potentially other species, this failure is probably a violation of the National Environmental Policy Act.

Comment No. 11-3

2. This proposed project is only one of many proposals to develop groundwater from an integrated regional deep carbonate aquifer. Integration of that aquifer has been demonstrated by numerous scientific studies by USGS and other competent hydrologists. These numerous studies develop a consistent, generally accepted consensus that the regional aquifer is integrated, and that groundwater development in one segment of the aquifer is likely to have effects (some of which may be delayed for decades or even centuries) over long geographic distances. Failure to examine the relative contribution of this project to groundwater depletion in the regional aquifer causes this EIS to ignore some of its most probable adverse affects to endangered species.

Comment No. 11-4

3. To some degree this draft EIS relies upon data and studies completed by the project proponent (Vidler/Lincoln County Water District) to assess probable impacts. Conclusions from these studies were rejected by the Nevada State Engineer in his ruling on applications for groundwater from Kane Springs Valley by Vidler/Lincoln County Water District. The fact that those conclusions were rejected by the regulatory agency directly responsible for administering groundwater rights, means there is no justification for relying upon those data in the EIS.

Comment No. 11-5

In view of the deficiencies noted above, it is incumbent upon the BLM to rewrite the draft EIS, analyzing the full range of alternatives, the probable impacts of groundwater pumping, and the cumulative impacts of all proposals to pump and export groundwater from the regional carbonate aquifer. Furthermore BLM must rely on peer-reviewed independent scientific literature, not unacceptable, non-peer-reviewed conclusions presented by the project proponent.

James E. Deacon
968 Camelia Drive
Henderson, NV 89011

Response to Comment No. 11-2

The effects of groundwater withdrawal are discussed in the EIS in Section 4.3, 4.5, and 4.20.3.3.2.

Response to Comment No. 11-3

Cumulative effects of existing and reasonably foreseeable projects on groundwater depletion of the regional aquifer are discussed in the cumulative impact section 4.20.4.2. Several studies presented in this section untilized large-scale modeling to analyze cumulative impacts from groundwater pumping on regional aquifer. These studies include Schaefer and Harrill 1995, LVVWD 2001, GeoTrans 2001, and USFWS 2006 (see section 4.20.4.2). Cumulative impacts to endangered species are described in section 4.20.4.4.

Response to Comment No. 11-4

The preparation of an EIS follows an established process. Data is provided by the proponent, BLM carefully considers the data and accepts or rejects it. Technical information provided by the Proponent is reviewed by the BLM and its contractor. The BLM then deploys a team of specialists within sister agencies to review the data. Also see responses to comments 5-4 and 8-2-1.

Response to Comment No. 11-5

Chapter 4 (Environmental Consequences) describes potential indirect impacts to regional springs and other sensitive resources within the project region of influence. Chapter 4.20 (Cumulative Impacts) describes potential cumulative impacts to regional springs and other sensitive resources within the cumulative impact region of influence. Applicant proposed Environmental Protection Measures are listed in Appendix C. Monitoring and mitigation program is discussed above.

"Jo Anne Garrett"
<joagarrett@surfbest.net>
08/20/2007 10:23 PM

To <nvgwprojects@blm.gov>
cc
bcc
Subject Comments on Kane Springs Draft EIS

To: BLM/Groundwater Projects Office
Reno, NV 89520

From: Jo Anne Garrett
Baker, NV 89311

Re: Kane Springs Draft EIS

The above-named Draft EIS is amazingly disappointing! I trust that another document will be crafted in order to address all of the deficiencies that will surely be pointed out by other more knowledgeable people than myself.

The proposal to transfer thousands of gallons of desert water to construct an unsustainable luxury development indicates ignorance or total disregard, or both, on the part of the developer. A project of this magnitude is a dire threat the the fragile Great Basin ecosystem, and requires the most thorough study of environmental impacts, rather than the cursory and partial approach of this Draft. The new Draft should address at least the following:

Comment No. 12.1

1) A complete range of alternatives needs to be studied.

Comment No. 12.2

2) A complete study of ***all impacts*** needs to be done, including first of all the impact of pumping these quantities of water.

Comment No. 12.3

3) The cumulative impacts of the growing number of proposals targeting the groundwater of interconnected basins in counties of both Nevada and Utah must be thoroughly studied and included in the new Draft.

Comment No. 12.4

4) The Public Scoping Comments must be honored by a careful review and response for every valid concern

Comment No. 12.5

5) Scientific and technical information and data must include valid, peer-reviewed sources! The proponent's info and data must be validated, or it is meaningless.

Thanks for your careful reconsideration and rectifying of this important DEIS !!

Jo Anne Garrett
775-234-7205
P.O.Box 130
Baker NV 89311

Response to Comment No. 12-1

As explained in Chapter 1.5 - Scoping, the BLM considered comments received through public scoping when developing the scope of issues and alternatives to be analyzed in the Draft EIS. All comments received during scoping were systematically reviewed by an interdisciplinary team of resource specialist from various BLM offices, representatives from cooperating agencies, and the BLM's EIS consultants.

Response to Comment No. 12-2

Section 4.20.4 specifically addresses potential impacts from this project including the effects of pumping 1,000 af/y and 5,000 af/y of groundwater in the Kane Springs Valley.

Response to Comment No. 12-3

Each of the areas mentioned involve separate projects with their own unique issues and timelines. Each represents a discreet hydrographic basin for which the allocation of water rights is under the authority of the Nevada State Engineer. The cumulative resource analysis area for water resources includes the following Hydrographic Areas: Kane Springs Valley (No. 206), Coyote Springs Valley (No. 210), and Muddy River Springs Area (No. 219). Projects occurring within these areas were evaluated for cumulative impacts (Chapter 4.20.4.2).

Response to Comment No. 12-4

See response to comment 12-1

Response to Comment No. 12-5

Environmental resource data was collected and analyzed to the level of detail necessary to understand potential impacts and to distinguish project effects (both beneficial and adverse) among the Proposed Action and alternatives. The data analyzed in this EIS are the best available representation of current and predicted conditions at this time. However, there is a level of uncertainty associated with any set of data in terms of predicting impacts, especially where natural systems are involved. See also responses to comments 5-4, 8-2-1, and 11-4.

RECEIVED
... LAND MANAGEMENT
... STATE OFFICE

07 JUN 28 AM 9:00

2340 W 1620 N Circle
Saint George, UT 84770

June 23, 2007

Penny Woods, Nevada Groundwater Project Manager
U.S. Bureau of Land Management, Nevada State Office
PO Box 12000
Reno, NV 89520-0006

Re: N 1793 (Kane Springs Valley)

I am a mineral exploration geologist employed by a public corporation which is developing resources in Lincoln County. I was formerly a Nevada resident engaged in geological work in Nevada for over 40 years.

I oppose the proposed Kane Springs Valley Groundwater Development Project for the following reasons:

Comment No. 13-1

A. The project will overdraw groundwater basins in Lincoln County and western Utah for the purpose of building an unnecessary "new city" in the desert, including golf courses, swimming pools, lawns and other water-wasteful uses for which the desert environment is unsuited. I believe that these water uses will deprive current agricultural and stockraising businesses of water necessary for their livelihood, and adversely affect natural wildlife.

Comment No. 13-2

B. In particular, I oppose exportation of water from Lincoln County and surrounding rural areas for the ultimate benefit of overdevelopment and wasteful water consumers in the Las Vegas area, which is clearly the ultimate intention of the several planned water schemes currently being reviewed.

Thank you for the opportunity to comment.

Peter H. Hahn, C.P.G.

Response to comment 13-1

As described in Chapter 1.2 – Purpose and Need, the purpose of LCWD's application to the BLM is to construct and operate infrastructure to convey groundwater resources permitted by the Nevada State Engineer across federal lands managed by the BLM. The CSI development in Lincoln and Clark County are separate actions from the Proposed Action. CSI development in both counties would occur in the absence of the Proposed Action. The NSE is the governing entity that has the authority to approve and control the amount of groundwater pumped from basins in Nevada. No impacts are expected to agriculture or stock raising (Chapter 4.6.1.2).

Response to comment 13-2

Comment noted.

Kane Springs Valley Groundwater Development Project
Draft Environmental Impact Statement
Comment Form

Public participation is critical to helping ensure BLM has considered the views of the public in the decision on this groundwater development project. BLM encourages you to get involved. Please take a few minutes to complete this form and provide any comments or questions you would like addressed. **The comment period ends on Monday, August 20, 2007.** Written comments can be sent via mail, fax, or e-mail to the BLM Nevada Groundwater Projects Office or submitted in person at the public meetings (see details below). Please contact the Groundwater Projects Office if you wish to receive a paper copy or CD of the Draft EIS.

Groundwater Projects Office Contact Info:

Phone: 775-861-6681 Fax: 775-861-6689 E-mail: nvgwprojects@blm.gov

Mailing Address:	Fed-Ex/Physical Address:
P.O. Box 12000	1340 Financial Blvd
Reno, NV 89520	Reno, NV 89502

Public Meeting Info:

Carson City, NV:	Monday, July 30, 2007, 4-6pm, Plaza Hotel (Sierra Room)
Pioche, NV:	Tuesday, July 31, 2007, 6-8pm, Pioche Town Hall
Alamo, NV:	Wednesday, August 1, 2007, 6-8pm, Ambulance Barn
Las Vegas, NV:	Thursday, August 2, 2007, 6-8pm, Atrium Suites Hotel (conference room F)

Name: Bruce Holloway E-mail: bholloway9@cox.net

Organization: Title:

Mailing Address: 1505 FRANDOSA LN

City: LAS VEGAS State: NV Zip: 89117

☒ Add my name to the mailing list ☐ Withhold my name and address from public review**

***Before including your address or other personal identifying information, you should be aware that this information may be made publicly available at any time. While you can ask us to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.*

Comment No. 14.1

COMMENT (continue on separate sheet if necessary)

There are several petroglyph sites in the area. You need to be aware of where they are.

B Holloway 7/2/07

Response to Comment No. 14-1

A cultural resources study, including field surveys to identify sites, was completed for the KSV DEIS. No sites were identified that would be impacted by this project.

Abigail C. Johnson
P.O. Box 183
Baker, NV 89311

August 19, 2007

RE: Kane Springs Draft EIS

The Kane Springs Draft EIS does not conform to the letter or spirit of the National Environmental Policy Act and its implementing regulations. Please make this letter and my comments part of the record.

Comment No. 15.1

1. The BLM did not adequately respond to the public scoping comments, specifically the outcry from many commenters for a thorough study of all the impacts of the proposed transfer of 1000-5000 acre feet to Coyote Springs. However, in the DEIS only pipeline construction impacts were studied. This is inadequate and unacceptable.

Comment No. 15.2

2. The draft EIS does not study a full range of alternatives.

Comment No15.3

3. The draft EIS does not fully analyze the impacts of the proposed project.

4. The draft EIS does not analyze the cumulative impacts of the many proposals to pump and export groundwater from the carbonate aquifer area in Lincoln, White Pine and Clark Counties in Nevada, and Utah counties bordering Nevada.

Comment No. 15.4

The BLM should re-write the draft EIS and analyze a full range of alternatives, the full range of impacts from pumping 1000-5000 acre feet to support the Coyote Springs development, the cumulative impacts of all of the current proposals to pump and export carbonate aquifer water in eastern Nevada, and to use only peer-reviewed independent science in the new (rewritten) draft EIS.

Thank you for considering my comments and making them part of the official administrative record for this project.

Sincerely,

Abigail C. Johnson

Response to Comment No. 15-1

As explained in Chapter 1.5 - Scoping, the BLM considered comments received through public scoping when developing the scope of issues and alternatives to be analyzed in the Draft EIS. All comments received during scoping were systematically reviewed by an interdisciplinary team of resource specialist from various BLM offices, representatives from cooperating agencies, and the BLM's EIS consultants. See also response to comment 15-1.

Response to Comment No. 15-2

As described in Chapter 1.2 – Purpose and Need, the purpose of LCWD's application to the BLM is to construct and operate infrastructure to convey groundwater resources permitted by the Nevada State Engineer across federal lands managed by the BLM. The NSE is the governing entity that has the authority to approve and control the amount of groundwater pumped from basins in Nevada.

Response to Comment No. 15-3

The EIS, as written, complies with the Council for Environmental Quality regulations for implementing NEPA (40 CFR § 1500-1508). Potential impacts of the proposed project are fully disclosed in Chapter 4.0

Response to Comment No. 15-4

Early in the NEPA compliance process, BLM considered whether to include all of the groundwater projects in a single NEPA analysis. For the following reasons, BLM concluded that all of the groundwater projects should not be included in a single NEPA analysis, but rather treated as separate Right-of-Way applications: 1) the projects are located in different geographic areas; 2) they each are drawing water from different hydrographic basins; 3) they are not dependent one upon the other; 4) they are being developed in differing timeframes and the related water is demanded at different times; and 5) the water being developed by each is being used in distinctly different locations.

Cumulative impacts are discussed for all resources in Chapter 4.20.4. The geographic scope for the analysis is referred to as the cumulative resource analysis area and varies by resource. The timeframe for the cumulative impact analysis encompasses past and present activities in the areas described above, and future activities that may extend up to 20 years in the future and is described in Chapter 4.20.2. Other actions affecting resources, ecosystems, and/or human communities of concern are described in Section 4.20.3 Cumulative Projects Considered.

"Abigail Johnson"
<saged183@gmail.com>
08/20/2007 10:23 PM

To nvgwprojects@blm.gov
cc
bcc
Subject Kane Springs EIS comments

Please find attached comments in Word document and make them part of the record of comments on the Kane Springs DEIS. Thank you.

Abigail Johnson
PO Box 183
Baker NV 89311 Kane Springs DEIS.doc

Information
Washington/WO/BLM/DOI
Sent by: Peggy S Britell

07/05/2007 08:09 AM

To bk1492@aol.com
cc nvgwprojects@blm.gov
bcc
Subject Re: Fwd: public comment on kane spring valley groundwater development project deis

Your email has been forwarded to our Nevada State Office.

bk1492@aol.com

bk1492@aol.com
07/05/2007 11:01 AM

To woinfo@blm.gov
cc
Subject Fwd: public comment on kane spring valley groundwater development project deis

what is wrong with the e mail address that was listed in this kane valley project? it is not working. please forward

b sachau

-----Original Message-----
From: Bk1492@aol.com
To: nygwproject@blm.gov; americanvoices@mail.house.gov; comments@whitehouse.gov; vicepresident@whitehouse.gov
Sent: Thu, 5 Jul 2007 7:16 am
Subject: public comment on kane spring valley groundwater development project deis

Comment No. 16.1

i am concerned about the effect of this development on animal and bird life, who previously had water access. what specific steps are you taking to keep the wildlife and birds that live in this area alive. i know that developers care very little about wildlife and birds, but it is important to the national owners of this land to save their lives and we want action to do so. please do not go in and kill them BEFORE developmetn which also happens far too often and is never punished by our laws.

Response to Comment No. 16-1
Access to surface water for wildlife would not be impaired by the Proposed Action or Alternative 1.

Comment No. 16.2

what has management done to stop the sale of invasive species by nursery profiteers in this area? national taxpayers should NOT be taxed to clean our invasive species purposefully sold by profiteers in the area. this needs to be stopped completely. stop every single nursery profiteer from selling these plants and get the word out that nobody should trade in these plants at any time. they are a problem. they need to be wiped out. they are not native.

Response to Comment No. 16-2
The sale of invasive species by nurseries is beyond the scope of this EIS. The comment has been noted and will be included in the administrative record for this EIS.

Comment No. 16.3

comments on specific pages - es14 - it is not "temporary" disturbance when its a couple of years or even a year, which wipes out food source, water source for wildlife and birds. they die. can you go without water or food for a year - let's get real here about the deaths that will be caused in the animal community and stop lying with these deceptive words "temporary disturbance". these plans are death to wildlife. we cannot take the continued assault of mankind and developers--they are wiping out the natural world. this is wrong..

Response to Comment No. 16-3
The comment has been noted and will be included in the administrative record for this EIS.

Comment No. 16.4 es15 - the meager funds for the tortoise show the horror of wildlife killing --trying to be made up by paying a few cheap bucks - why arent the grazing areas used for this project instead? get rid of the cattle ranchers with their assaults on the environment makes much more sense.

Comment No. 16.5 pg 4-21 - please make sure no bird or wildlife is EVER impacted by any negligently designed power line structures. make these power lines build environmentally instead of accomplishing bird and wildlife death as they presently do. why are we allowing hese profiteers to get away with this kind of horror anyway?

Comment No. 16.6 pg 4-40 why isnt the "utility use" on private land bought and paid for by the utility profiteers?

Comment No. 16.7 4-41 i do not agree or believe the statement that it is "unlikely" individual tortoises would be destroyed. that seems like a deceptive statement in my opinion.

Comment No. 16.8 5-2 - consults with other agencies is certainly not always what the american public wants done with their land that they own. politicians are being bought every day by fat cat lobbyists and working for their own interests and not public interest. or the poliicians pander to special interests or developers and exercise power over these agencies. the stiuation emanating from the corruption in washington dc these days is bringing about agencies who FORGET the general public interest and indeed work against the general public good. we need the general public more involved. we dont need agencies making choices on alternatives for us - that is outrageous.

appendix c losses are too great. the whole plan needs replanning.

b. sachau
15 elm st
florham park nj 07932

Response to Comment No. 16-4

A remuneration fee will be determined by and paid to the USFWS for potential impacts to the desert tortoise. This fee will be determined in the Biological Opinion that is expected to be issued by February 10, 2008. The fee will be used for habitat enhancement and future studies for the purpose of ensuring the continued existence of the species. As explained in Chapter 3.6.1, the project area crosses two range allotments - Delamar and Grapevine, both of which are cow/calf operations.

Response to Comment No. 16-5

As described in Chapter 4.5.1.2.3, Migratory Birds, the transmission lines associated with the Proposed Action follows recommendations by the Avian Power Line Interation Committee to minimize electrocution and collision mortality.

Response to Comment No. 16-6

The text of this FEIS has been changed in Chapter 4.5.1.1.1 to reflect the possibility that individual desert tortoise may be harmed as a result of the Proposed Action and Alternative 1.

Response to Comment No. 16-7

An ESA Section 7 incidental take permit for desert tortoise will be required for the Proposed Action and Alternative 1.

Response to Comment No. 16-8

The NEPA and ESA require the BLM to consult with the USFWS, tribes, state, and local agencies. A list of these agencies is provided in Chapter 5.2.

jean public
<jeanpublic@yahoo.com>
06/22/2007 08:21 AM

To nvgwprojects@blm.gov, comments@whitehouse.gov, americanvoices@mail.house.gov
cc vicepresident@whitehouse.gov, nytnews@nytimes.com, foe@foe.org, info@defenders.org
bcc
Subject public comment on federal register of 6/22/07 vol 72 #120

Comment No. 16.9

fed reg doc e7 11807 ground water development facilities in kane springs valley nevada

please send me a paper copy of the ea on this project as well as extend time to comment by 60 days.

nevada is growing at a rapid pace but i want to know what arrangements have been made in the taking of all of this water so that birds, animals can have water to drink and that they are not sucked dry by this taking. i need the details on this please becaause if i dont see that arrangements are made for birds and wildlife to have water, i say can and ban the project.

it is time that we co exist with god's creatures on this earth and not suck them dry and kill them with projects like these.

.b sachau
15 elm st
florham park nj 07932

<u>*Response to Comment No. 16-9*</u>
Comment noted.

"Carl Savely"
<Carl.Savely@WingfieldNevadaGroup.com>
08/14/2007 07:29 AM

To <nvgwprojects@blm.gov>
cc "Don Pattalock" <dpattalock@nlrc.com>
bcc
Subject Comments to Kane Springs Valley Groundwater Development Project Draft EIS

Penny Woods,
Nevada Groundwater Project Manager

Comment No. 17.1

I am providing this comment on behalf of Coyote Springs Investment LLC ("CSI"), the master planner of the Coyote Springs Development – Lincoln County. The first sentence of the last paragraph of Section 4.20.3.3.2 on page 4-54 states "CSI anticipates 55,000 AFY would be needed to serve the development's water needs at build out." Please replace the number "55,000" with the number "70,000" in this sentence. This change needs to be made to ensure consistency with the EIS being prepared in support of CSI's 404 permit and ESA Sec. 10 permit applications associated with the Coyote Springs Development – Lincoln County.

Please let me know if you have any questions.

Carl Savely

Carl D. Savely
General Counsel
Wingfield Nevada Group Management Company
6600 N. Wingfield Parkway
Sparks, Nevada 89436
Direct Line: 775-321-5940
Main Line: 775-626-6000
Fax: 775-626-8925

Response to Comment No. 17-1

The DEIS separates CSI water requirements by county - Clark County approximately 15,000 AFY (Chapter 4.20.3.2.1) and Lincoln County approximately 55,000 AFY (Chapter 4.20.3.3.2).

Email to nvgwprojects@blm.gov

Penny Woods,
Project Manager
BLM Nevada Groundwater Projects Office

Comment on Kane Springs Valley Groundwater Development Project Draft Environmental Impact Statement

Comment:
Map 4-1, Interrelated Projects, indicates the location of Mineral Survey 1905 incorrectly.

Comment No. 18.1

Explanation:
Mineral Survey 1905 is located generally between Jacks Mountain and Mud Springs in one or more of the unsurveyed sections 29, 32, and/or 33, T6S R70E. Correspondence from the BLM Nevada State Office (9600 (NV-952)MS Position dated Aug 11, 2004) indicates the location as depicted on the Master Title Plat is in error. Following this correspondence the following note was added to the Master Title Plats:

> 9/2/04 "MS 1905 location uncertain: Natural calls in the mineral survey record when referenced to U.S.G.S. quadrangle maps "Jacks Mountain and Bunker Peak" indicates the mining claim is approximately one mile northeasterly of the location shown on this plat (unsurveyed T. 6S. R. 70 E. secs 23 and 33)."

Although not within the immediate area of the Kane Springs Valley Groundwater Development Project there has been almost three years for the correct location information to be included in new map products. Other BLM activities are planned in the area of MS 1905 in the near future and it would be appropriate to see MS 1905 correctly located on those maps as well as in the current document.

I believe funds made available through the Lincoln County Lands Act (LCLA) and/or Lincoln County Conservation, Recreation and Development Act (LCCRDA) could be appropriately and legitimately applied to the survey of this Mineral Survey.

Thanks

Tim Vogt
timv@earthlink.net

Response to Comment No. 18-1
Comment noted.

"Tim Vogt"
<timv@earthlink.net>
08/19/2007 05:56 PM

To <nvgwprojects@blm.gov>
cc <timv@earthlink.net>
bcc
Subject Comment: Kane Springs Valley Groundwater Development Project DEIS

Email to nvgwprojects@blm.gov

Penny Woods,

Project Manager

BLM Nevada Groundwater Projects Office

Comment on Kane Springs Valley Groundwater Development Project Draft Environmental Impact Statement

Comment:

Map 4-1, Interrelated Projects, indicates the location of Mineral Survey 1905 incorrectly.

Explanation:

Mineral Survey 1905 is located generally between Jacks Mountain and Mud Springs in one or more of the unsurveyed sections 29, 32, and/or 33, T6S R70E. Correspondence from the BLM Nevada State Office (9600 (NV-952)MS Position dated Aug 11, 2004) indicates the location as depicted on the Master Title Plat is in error. Following this correspondence the following note was added to the Master Title Plats:

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I believe funds made available through the Lincoln County Lands Act (LCLA) and/or Lincoln County Conservation, Recreation and Development Act (LCCRDA) could be appropriately and legitimately applied to the survey of this Mineral Survey.

Thanks

"Peter G Williamson" <petergw@pacbell.net>
07/14/2007 11:51 AM

To <nvgwprojects@blm.gov>
cc
bcc
Subject Comments on Kane Springs Valley Groundwater Development Project Draft EIS

To Whom It May Concern:

Comment No. 19.1

I have two questions regarding this EIS. First, how has the determination of number of monitoring wells been made? And second, as I understand it, the reference level for the monitoring wells is proposed to be at the time the project is complete prior to extraction. This is a single point in time – is there any evidence that this reference level and timing are representative of groundwater levels throughout the year? Or, do these levels fluctuate relative to the timing of spring runoff? If this were the case, it should be taken into consideration in establishing reference levels.

Peter

Peter Williamson

Response to Comment No. 19-1

The LCWD and USFWS Stipulated Agreement and the associated Mitigation, Monitoring, and Management Plan are described in Chapter 1.4.2.1. Key components of the agreement have been summarized and added to this section as a bulleted list. The Kane Springs Valley Groundwater Development project would be constructed and operated in accordance with the stipulated agreement, and monitoring plan directed by the Nevada State Engineer. Currently eight wells, in the project region of influence, are being monitored. The final number of wells to be monitored and the frequency of data collection will be determined by the Nevada State Engineer, in consultation with the US Fish and Wildlife Service.

ABBREVIATIONS AND ACRONYMS

AADT	Annual Average Daily Traffic
ACEC	Area of Critical Environmental Concern
AFY	acre-feet per year
AIRFA	American Indian Religious Freedom Act
AMI	Area Median Income
amsl	above mean sea level
ANFO	ammonium nitrate and fuel oil
Applicant	Lincoln County Water District
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ATR	Automatic Traffic Reader
AUM	animal unit month
BARCASS	Basin and Range Carbonate Aquifer System Study
BCCRT	Basic City-County Relief Tax
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMPs	best management practices
CCDAQM	Clark County Department of Air Quality Management
CEDS	Comprehensive Economic Development Strategy
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
CO_2	carbon dioxide
CTX	consolidated tax
CSI	Coyote Spring Investment, LLC
dB	decibel
dBA	A-weighted decibels
DRI	Desert Research Institute
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
ft/day	feet per day
FY	fiscal year
GID	General Improvement District
gpd/ft	gallons per day per foot
gpm	gallons per minute
hp	horsepower
I-15	Interstate 15
ID	interdisciplinary
IPCC	Intergovernmental Panel on Climate Change
KOP	Key Observation Point
kV	kilovolt

LCCRDA	Lincoln County Conservation, Recreation, and Development Act of 2004
LCLA	Lincoln County Land Act
LCPD	Lincoln County Power District No. 1
LCT	Lincoln County Telephone Company
LCWD	Lincoln County Water District
L_{dn}	Day/Night Average Sound Level
L_{dnmr}	Onset Rate Adjusted Monthly Day-Night Average Sound Levels
LS Power	LS Power Electrical Transmission Project
Ma	million years ago
MBTA	Migratory Bird Treaty Act
MFP	management framework plan
mg/L	milligrams per liter
mi^2	square miles
MOA	memorandum of agreement
MSHCP	Multiple Species Habitat Conservation Plan
MVPT	Motor Vehicle Privilege Tax
MVWD	Moapa Valley Water District
MW	megawatt
NAC	Nevada Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NWR	National Wildlife Refuge
OEDP	Overall Economic Development Plan
OHV	off-highway vehicle
O_2	Oxygen
O_3	Ozone
$PM_{2.5}$	particulate matter with mean aerometric diameter smaller than 2.5 microns
PM_{10}	particulate matter with mean aerometric diameter smaller then 10 microns
POD	Plan of Development
PVVFPD	Pahranagat Valley Volunteer Fire Protection District
RFFA	reasonably foreseeable future action
RMP	Resource Management Plan
ROI	Region of Influence
ROW	right-of-way
RPTT	Real Property Transfer Tax
RV	recreational vehicle

SCCRT	Supplemental City/County Relief Tax
SHPO	State Historic Preservation Office
SNWA	Southern Nevada Water Authority
SO_2	sulfur dioxide
SOP	standard operating procedure
SR	State Route
SPCCC	Spill Prevention, Containment, Countermeasure, and Cleanup
SWIP	Southwest Inter-tie Project
SWPPP	Storm Water Pollution Prevention Plan
TDS	total dissolved solids
TMDL	Total Maximum Daily Loads
ug/L	micrograms per liter
ug/m^3	micrograms per cubic meter
UP	Union Pacific
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
Vidler	Vidler Water Company, LLC
VOC	vaolatile organic compound
VRM	Visual Resource Management
WMA	Wildlife Management Area

R

S

V

W

Y