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 Council for Environmental Quality (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 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). 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 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

LCWD would be responsible for constructing and operating the proposed groundwater facilities. LCPD would be responsible for constructing and operating the proposed electric utility facilities. LCT would be responsible for installing and operating the fiber optic cable. Coordination is ongoing among the utilities regarding common construction, maintenance access roads and sharing of 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. Initial pump

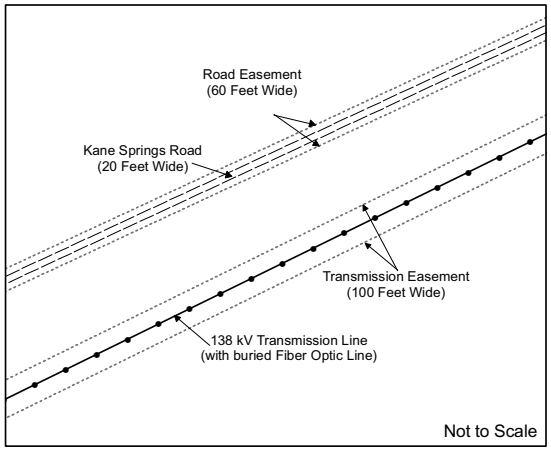


Diagram A: Typical Layout Planview

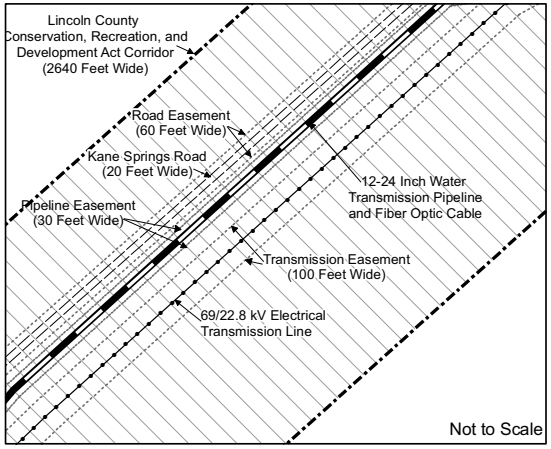
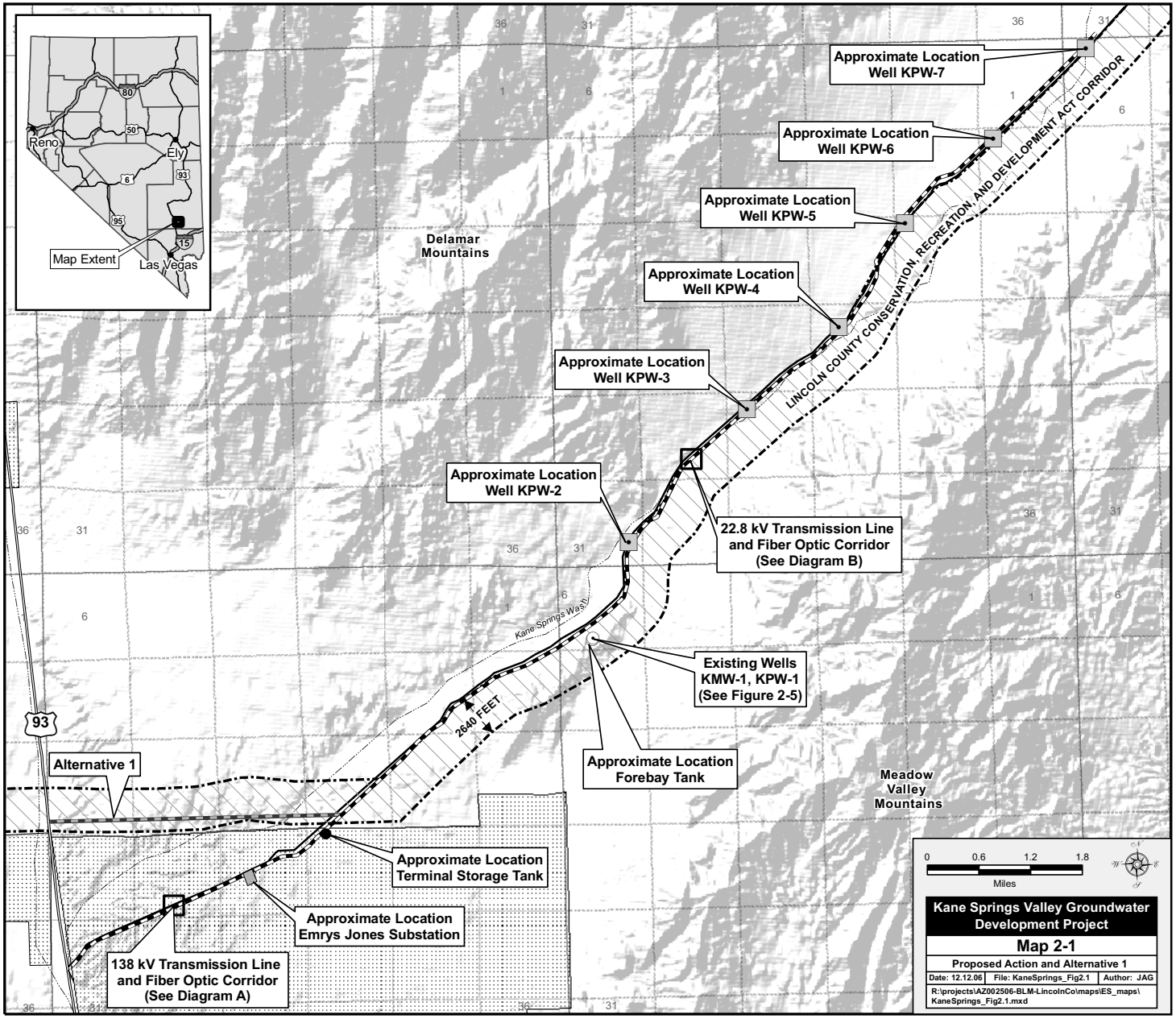


Diagram B: Typical Layout Planview

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



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 be provided to the production wells by the LCPD via a 22.8 kV circuit, which would tie into the proposed overhead 69 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.

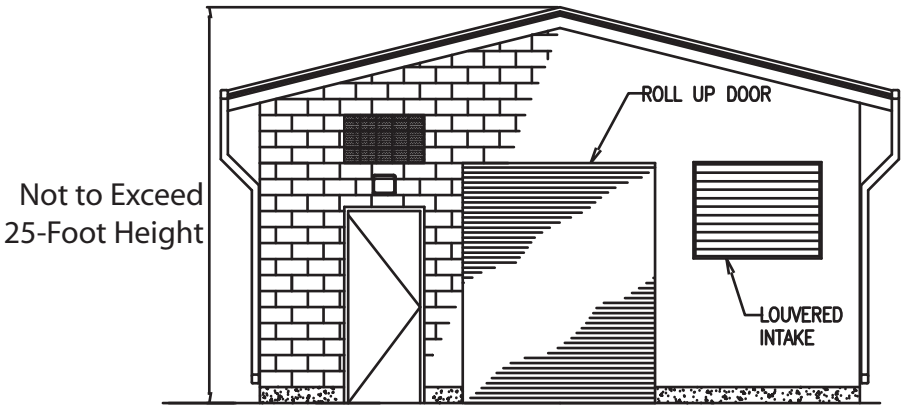
2.1.1.2 Monitoring Wells

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 LCWD and others to monitor groundwater conditions in the area as identified in the LCWD/Vidler Water Company (LCWD/Vidler) and USFWS Stipulation in **Appendix A**.

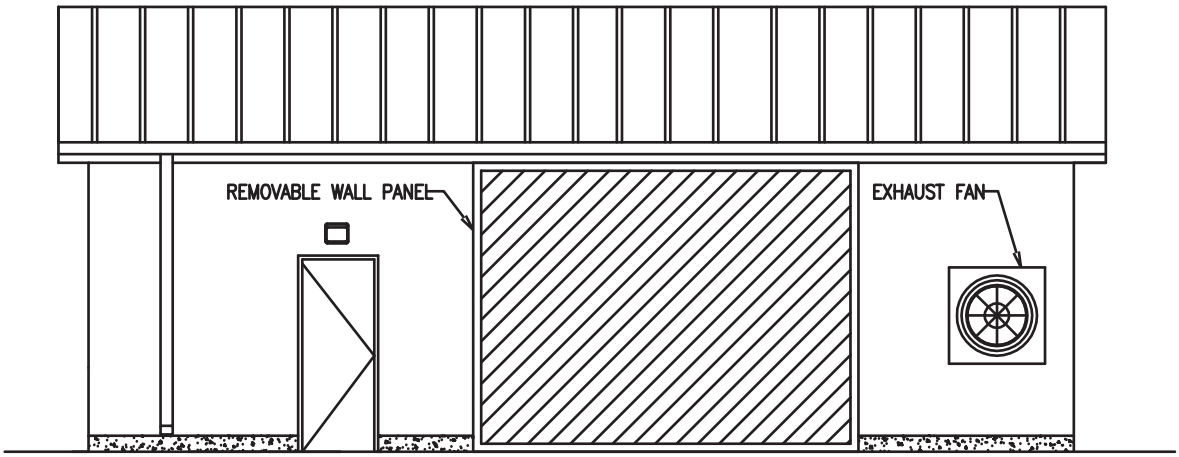
2.1.1.3 Pipelines

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

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



END ELEVATION



SIDE ELEVATION

Figure 2-1
Typical Production
Well House Building

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

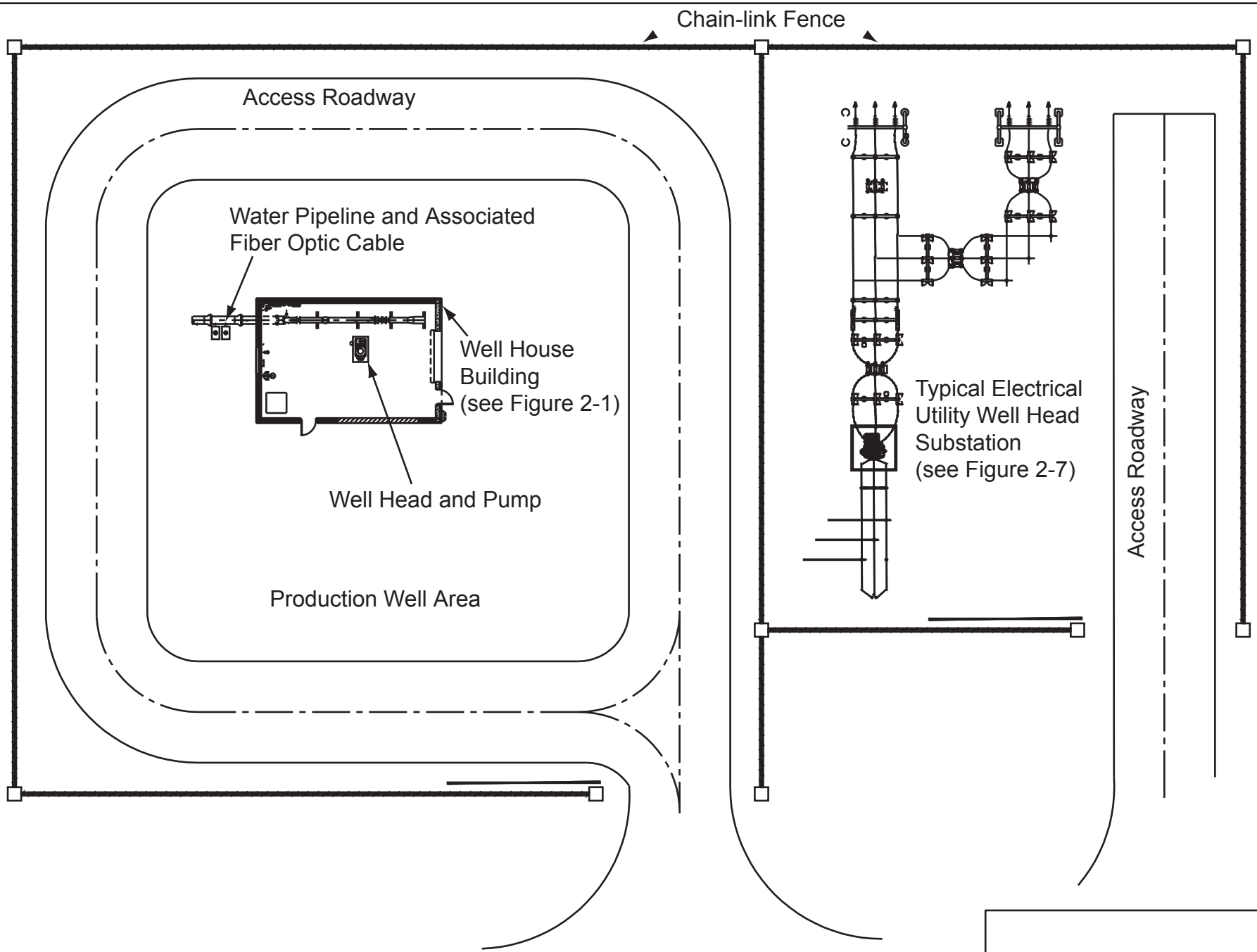


Figure 2-2
Typical Production
Well Facility Site Plan

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

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.

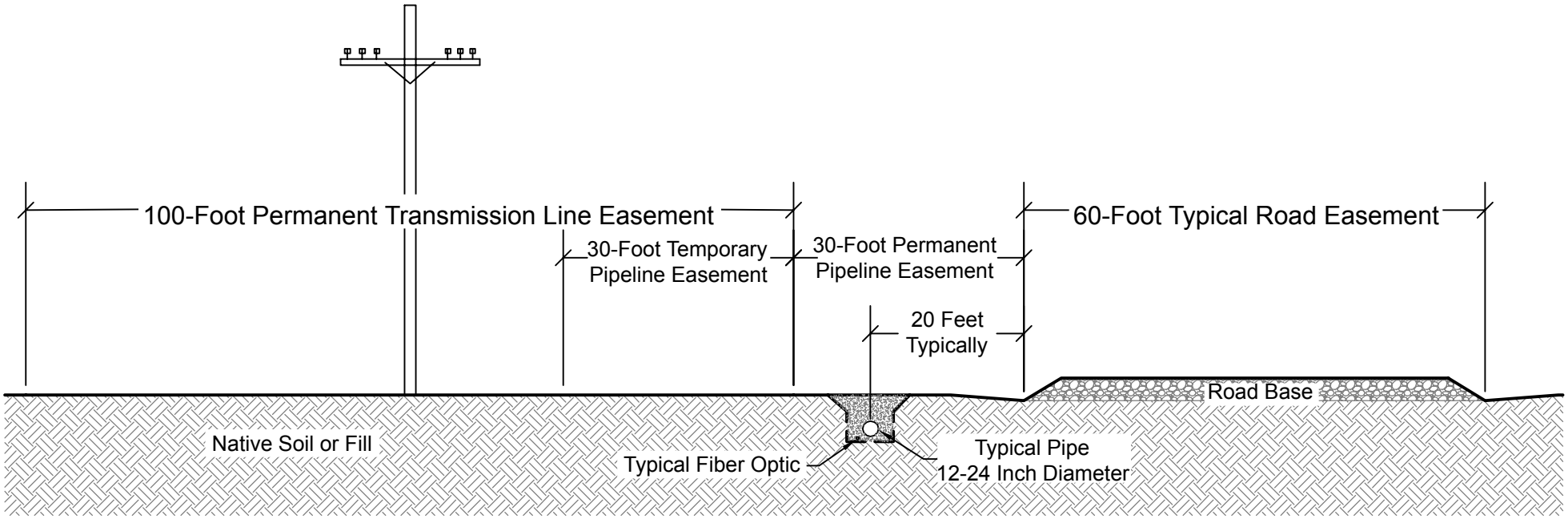


Figure 2-3
Typical Parallel Road Alignment
Right-of-Way Easement

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

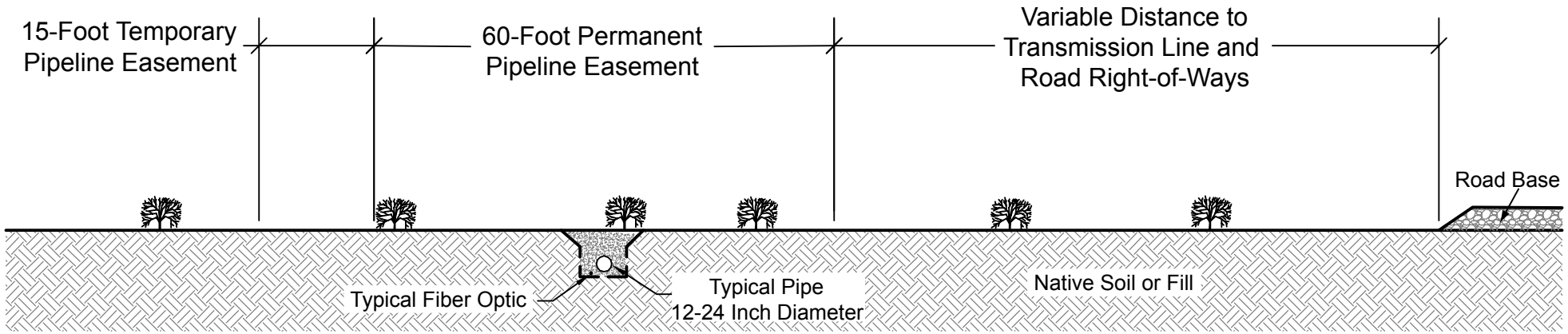


Figure 2-4
Typical Cross-Country
Construction Right-of-Way

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

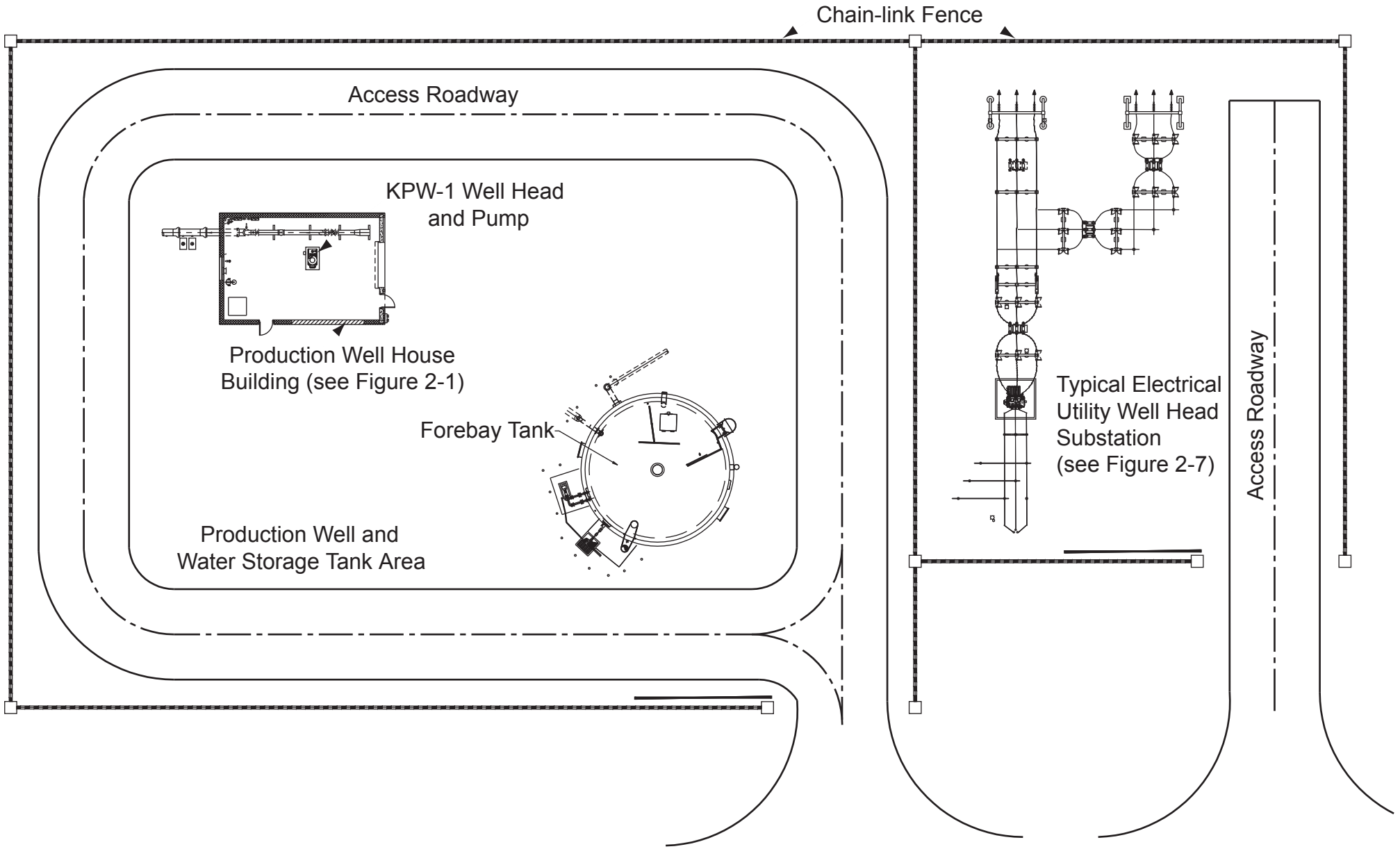


Figure 2-5
KPW-1
Well Facility Site Plan

Kane Springs Valley
Groundwater Development Project

Not To Scale
Source: LCWD, 2007

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, LCPD would construct and operate approximately 2.7 miles of 138 kV overhead transmission line east of Highway 93 and south of Kane Springs Road from LCPD's existing transmission line, currently located west of Highway 93. LCPD would construct a step-down substation (the Emrys Jones Substation) approximately 2.7 miles east of Highway 93 and south of Kane Springs Road. From this substation, an overhead transmission line with a 69 kV/22.8 kV distribution circuit would be routed along Kane Springs Road to the proposed well fields, a total distance of 14.0 miles. At each well location, a 69 kV/22.8 kV to 4.16 kV pad-mounted step-down transformer located at each substation site (approximately 115 feet by 95 feet) would be constructed to serve the planned pump motor and ancillary equipment. Each of the proposed facilities is described in more detail in the following sections.

2.1.1.5.1 138-kV Transmission Line

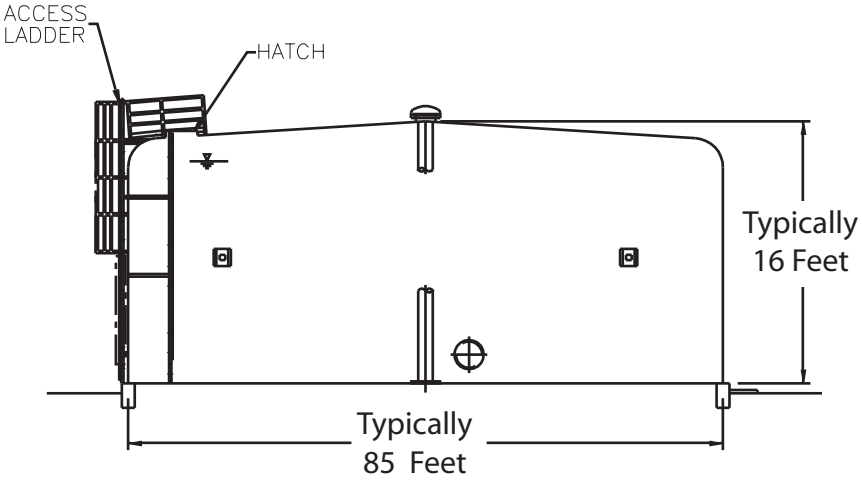
A new, 2.7-mile long, 138 kV transmission line would be constructed from LCPD's existing transmission line to the new Emrys Jones Substation. The 138 kV transmission line would be located on private property east of Highway 93 and south of Kane Springs Road. The 138 kV transmission line would be double-circuit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

The span length between structures would vary between 300 feet and 700 feet, depending on terrain (seven to nine poles per mile). Shield wire would be installed to protect the transmission line from direct lightning strikes. The entire proposed transmission line would parallel Kane Springs Road. 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 BLM and county specifications. LCPD would coordinate with LCPD and LCT to provide common access for construction and maintenance.

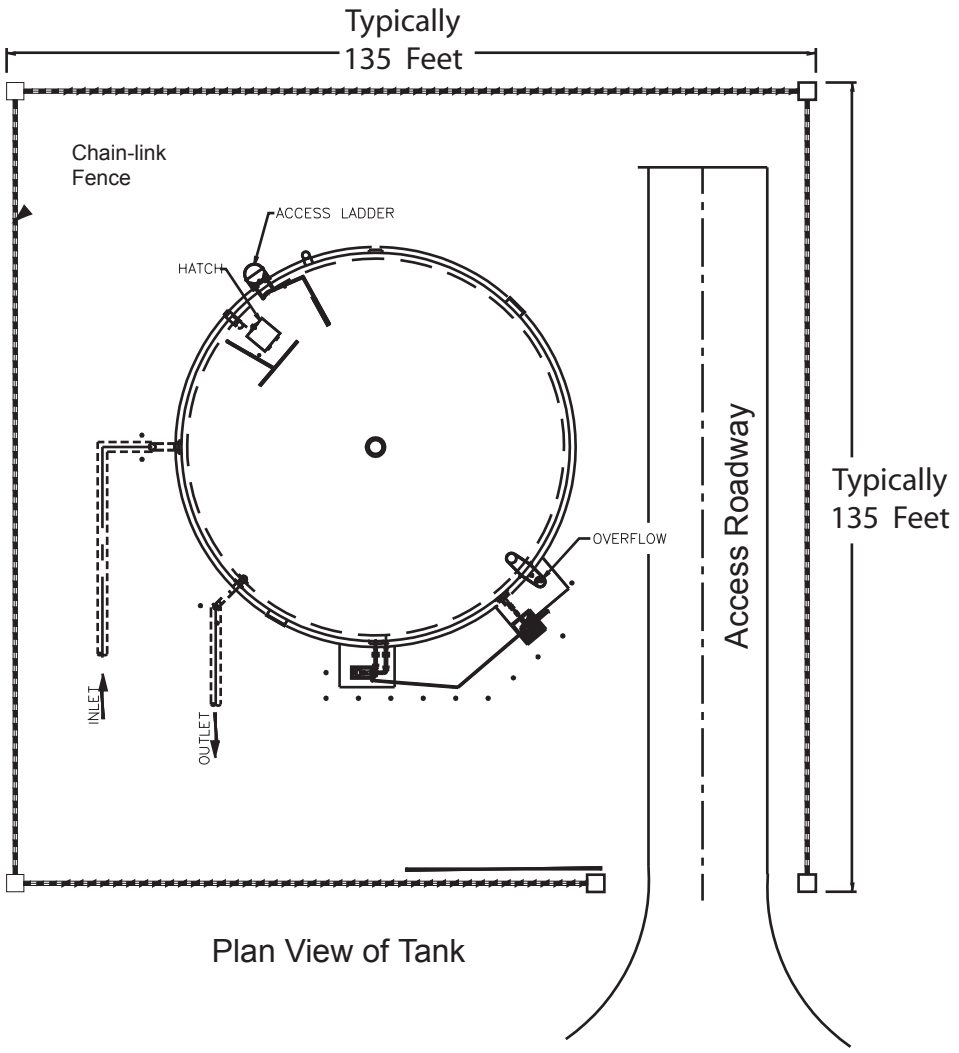
2.1.1.5.2 Emrys Jones Substation

A new substation, occupying a fenced area of 420 feet by 360 feet (approximately 3.47 acres), would be constructed on private property approximately 2.7 miles east of Highway 93 and south of Kane Springs Road. The Emrys Jones Substation would be constructed at the end of the 138 kV transmission line in order to provide service to the well fields. The substation would be planned and sized for future electrical needs in the northern Coyote Spring Valley area.

Not To Scale



Side View of Tank



Plan View of Tank

Figure 2-6
Conceptual Terminal Storage Tank Layout

Kane Springs Valley Groundwater Development Project

Source: LCWD, 2007

The new facility would transform voltage from 138 kV to 69 kV/22.8 kV and would provide means for switching among primary transmission lines. The fenced substation yard would contain circuit breakers, air break switches, one 138 kV to 69 kV/22.8 kV power transformer with oil containment facilities, bussing, steel structures, foundations and a grounding system. Protective relaying devices would be located within a control building.

2.1.1.5.3 69 kV/22.8 kV Transmission Line

A new 69 kV/22.8 kV overhead transmission line would be constructed from LCPD's proposed Emrys Jones Substation to each LCWD proposed well site; a total maximum distance of 14.0 miles. The transmission line would primarily be located on public lands managed by the BLM, with a short section near the Emrys Jones Substation located on private property. The 69 kV/22.8 kV transmission line would be a single-circuit line supported by wood pole structures. Angle and dead-end structures may be guyed wood poles or galvanized steel structures as determined by site-specific engineering.

Depending on terrain, pole heights would vary between 50 feet to 70 feet above ground level. Base diameters of the structures would vary from 3 to 7 feet. Each structure would require a temporary construction easement of 0.07 acre (60 feet by 50 feet). After construction, each structure would occupy 0.02 acre (30 feet by 30 feet).

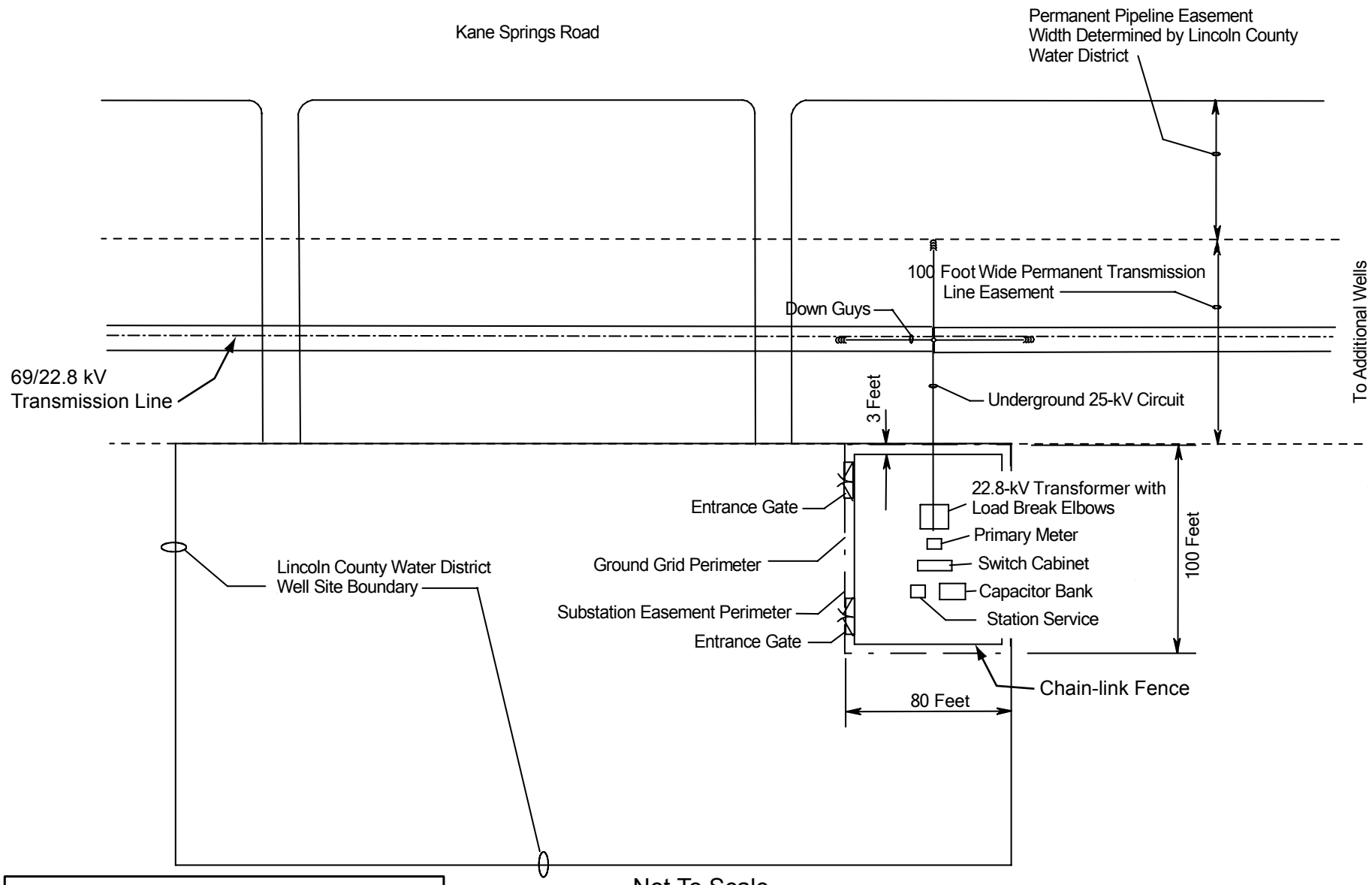
The span length between structures would vary between 200 feet and 400 feet depending on terrain (13 to 26 poles per mile). Shield wire would be installed to protect the transmission line from direct lightning strikes. The entire proposed transmission line would parallel Kane Springs Road. Access roads may be needed to access some locations. Spur roads 16 feet wide may be needed to access some locations. Access roads would be constructed within the permitted ROW in accordance with BLM and county specifications. LCPD would coordinate with adjacent utilities to provide common access for construction and maintenance.

2.1.1.5.4 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 69 kV/22.8 kV circuit on the transmission line. The fenced substation yards would consist of a 69 kV/22.8 kV to 4.16 kV pad-mounted step-down transformer, primary metering, switch cabinet, capacitor bank and a station service transformer. 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.



Legend

- Road
- Easement Boundary
- 69/22.8-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

2.1.1.7 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. LCWD would provide a fire hydrant within the locked enclosure at KPW-1/forebay site and a key(s) would be provided to BLM's designated representative for access and use 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.

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 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 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

- Power Lines: approximately 2.7 miles of 138 kV overhead power lines located on private land and 14 miles of 69 kV/22.8 kV overhead power lines located primarily on public land
- Electrical Substations: Emrys Jones Substation located on private land and up to four smaller substations to serve each well
- Ancillary Facilities: access roads, temporary workspace, and a storage yard located on private land

Ancillary Project Components

- Fiber optic line
- Monitoring Wells: nine existing monitoring wells are currently being used to monitor groundwater conditions in the area

- 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

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

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

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

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 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	24.0	6.0
Total	191.0	23.0

* 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, LCWD, LCPD, and 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 that LCPD would be the first utility agency to begin construction after all approvals have been acquired.

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

- Engineering surveys and staking 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. 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.**

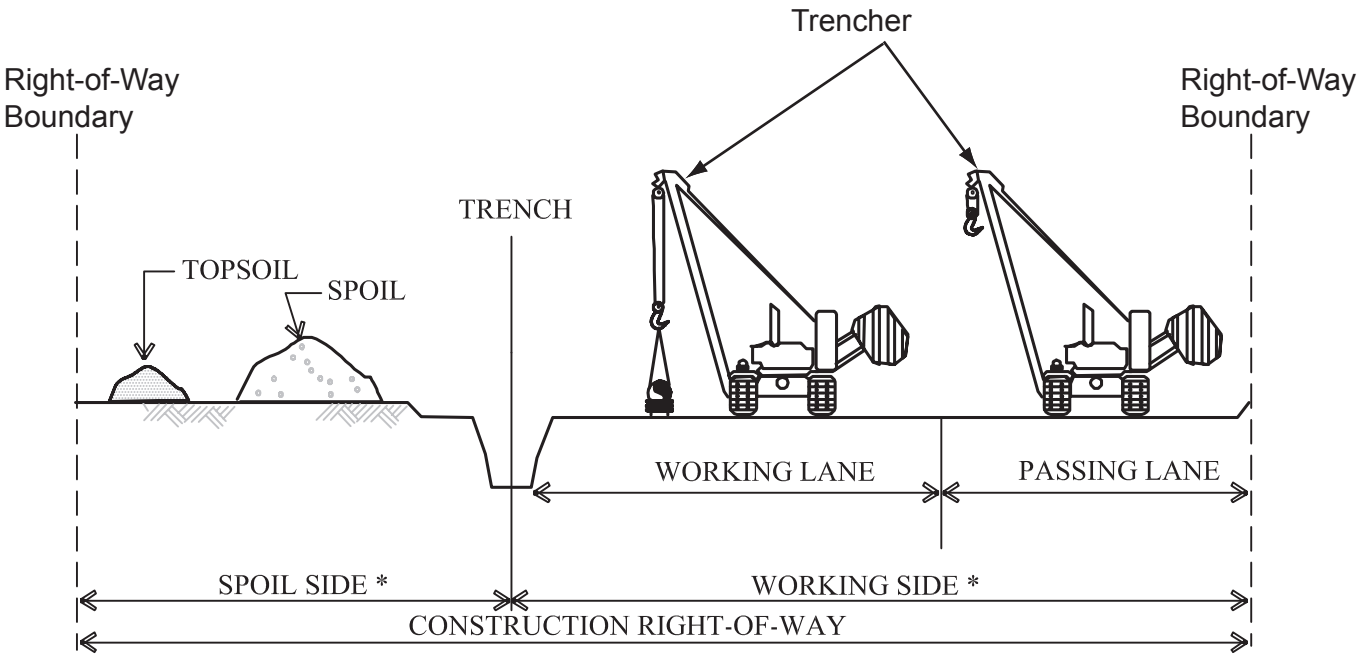
2.1.3.1.3 Clearing and Grading

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. 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.**



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

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

2.1.3.4 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 BLM requirements in effect at the time.

The electric utility facilities would become a permanent portion of LCPD's utility system. Facilities are planned for a 50- to 60-year life with anticipated indefinite extension 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 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 (ROD). 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**.

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. • 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

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

Plan[1]	Description Summary/Highlights	Resource Element
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
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 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 LCWD and its construction and reclamation contractors would implement during project construction in accordance with local regulations. • Designed to comply with 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.

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

Plan[1]	Description Summary/Highlights	Resource Element
Noxious Weed Management Plan	• Includes site-specific measures LCWD and its contractors would implement to control noxious weeds including, but not limited to, the use of cleaned, weed-free equipment; pressure washing of all vehicles and equipment prior to arrival at the work site; and the use of certified weed-free straw/hay bales to control erosion. • A key element of the Noxious Weed Management Plan is to identify and treat existing weed infestations prior to construction.	Includes measures to reduce the spread of noxious weed and impacts to vegetation communities and wildlife habitats.
Access Road Plan	• Describes measures to be taken by LCWD or its contractors to access project facilities and the ROW, reclaim temporary access roads, and prevent unauthorized vehicle use of the project ROW. • Includes descriptions of access routes and transportation-related activities.	Includes measures to minimize the use of access roads, thereby reducing potential impacts to vegetation communities 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, BLM would not approve 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 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 field 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 DEIS. 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 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 DEIS 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 DEIS because, while it is technically feasible to bury both the 138 kV and 69 kV/22.8 kV 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. 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 DEIS 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 191 acres of surface disturbance from construction of project facilities, of which 167 acres are BLM-managed lands. Approximately 23 acres would remain permanently impacted by project components (well yards, access roads, and overhead poles); of these approximately 17 acres would be on BLM-managed lands and approximately 6 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 that may occur 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 (continued)
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
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 191 acres, and permanent disturbance would be 23 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. 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.	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 habitat would be permanently disturbed by construction of Alternative 1. Approximately 191 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	No project-related impacts to wildlife resources would occur on public lands.

Table 2-3 (continued)
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
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 191 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. 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 DEIS. 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.	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.	
Land Use – Sections 3.6 and 4.6		
Approximately 191 acres (167 acres public, 24 acres private). Following construction 23 acres (17 acres public, 6 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	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.

Table 2-3 (continued)
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
impacts on traffic flows and volumes and also may contribute to roadway deterioration of Kane Springs Road during construction. LCWD has prepared an Access Road Plan which describes environmental protection measures and standard operating procedures for transportation-related activities.		
Areas of Critical Environmental Concern, Wilderness, and Other Special Use Areas – Sections 3.7 and 4.7		
Potential 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.
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.

Table 2-3 (continued)
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
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.
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 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.

Table 2-3 (continued)
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
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.
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.