



U.S. Department of the Interior
Bureau of Land Management

Las Vegas Field Office
Las Vegas, Nevada

March 2004



Interstate Intertie Centennial Plan Environmental Assessment

Harry Allen-Mead 500kV Transmission Line Project



DOE/EA-1470





United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130-2301



In reply refer to:
N-76327
2800 (NV-056)

Dear Interested Party:

Enclosed is the Environmental Assessment (EA) for the Nevada Power Company's (NPC) proposed right-of-way (ROW) application N-76327 to construct, operate, and maintain a 500KV transmission line from the new Harry Allen Substation to the Mead Substation (Boulder City) for your review and comment.

This proposed Harry Allen – Mead Substation 500kV transmission line would meet several purposes that include:

- Provide a greater reliability and capacity for NPC's transmission system
- Increase the ability to distribute available power to meet existing and future demands
- Increase NPC's ability to import power to meet growing electrical demand in the Las Vegas area

The 48-mile line includes BLM-32 miles, Bureau of Reclamation – 8 miles, Western Area Power Administration – 4 miles and private land – 4 miles.

The proposed alignment crosses the eastern portion of the Las Vegas Wash, a perennial drainage into Lake Mead that bypasses Lake Las Vegas. The line would also cross several unnamed ephemeral washes and unnamed ephemeral flood control channels at locations along the proposed alignment. A floodplain assessment is incorporated into this EA and a statement of findings will be published and distributed as required by DOE floodplain/wetland regulations.

The 30-day public comment period for this document will end on close of business on April 3, 2004. Please identify your comments and reference the case file N-76327 and the Harry Allen – Mead 500kV Transmission Line Project. Please send any comments you may have to **Scott Powers, Project Manager, BLM, Las Vegas Field Office, 4701 N. Torrey Pines Dr., Las Vegas, Nevada 89130-2301** or emailed to scott_powers@mt.blm.gov. If you have any questions, please contact the BLM Project Manager, Scott Powers at (406) 896-5319.

Sincerely,

Mark T. Morse
Field Manager

Chapter 1

Purpose and Need

1.1 Introduction

The construction of new transmission and distribution facilities is required throughout the western United States to meet the increasing demand for power as more people move to many of the fastest growing communities.

According to Executive Order 13212 dated May 18, 2001, “The increased production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people...agencies shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.”

Las Vegas is one of the fastest growing communities in the United States, and the demand for additional power transmission and use continues to increase as more and more people move into the Las Vegas Valley. The population is expected to increase to more than 2 million people in the next 10 years or less, which will put a demand on the existing power transmission system that cannot be met without system upgrades and improvements.

Nevada Power Company (Nevada Power) is proposing to use Federally-administered lands and interconnection requests to the Federal power system. Therefore, the lead agency, Bureau of Land Management (BLM) along with cooperating agencies, Bureau of Reclamation (USBR) and Western Area Power Administration (Western), have prepared this Environmental Assessment (EA) as part of their decision-making process. Through this decision process, the agencies will meet their obligations under the National Environmental Policy Act (NEPA) and respective Department of Interior and Department of Energy implementing regulations. The agencies will use the results of the EA to support a determination of whether or not to prepare an Environmental Impact Statement (EIS).

1.2 Applicant’s Underlying Purpose and Need

Nevada Power has a need to increase transmission capacity between its Harry Allen Substation and Western’s Mead Substation. The increased transmission must be obtained at a reasonable cost and within acceptable engineering design standards while minimizing environmental impacts. To meet this need, Nevada Power proposes to construct 48 miles of new 500kV transmission line running east of the greater Las Vegas area. See Figure 1-1 for the general location of the Harry Allen–Mead 500kV Transmission Line (Proposed Action). Of the 48 miles, 32 miles are within lands managed by the BLM, 8 miles are within lands managed by the USBR, 4 miles are within lands managed by Western and 4 miles are on private land. The increased transmission capacity would meet several purposes that include:

- Providing greater reliability and capacity for Nevada Power’s transmission system

- Increasing the ability to distribute available power to meet existing and future demands
- Meeting Nevada Power’s contractual obligation for transmission with various power producers
- Increasing Nevada Power’s ability to import power to meet growing electrical demand in the Las Vegas area

1.3 Need for Agency Action

The BLM, USBR and Western each have the need to respond to the applications for crossing lands under their jurisdiction. Additionally, Western has a need to respond to two applications for interconnection to the Federal power system and ensure reliability of the Federal power system.

1.4 Conformance with Resource Management Plan

The Proposed Action is subject to the BLM Las Vegas Resource Management Plan (RMP), approved October 5, 1998. The plan has been reviewed and it is determined that the Proposed Action is in conformance with the Las Vegas RMP, specifically decisions RW-1, RW-1-a and RW-1-h, which provide land for rights-of-way for major transmission lines within designated corridors, as well as land outside corridors for rights-of-way at the discretion of the agency. The Proposed Action is also in conformance with all other related Federal, state and local statutes, regulations and plans. Table 1-1 documents the Federal, state and local agencies’ approvals, reviews and permitting requirements for the transmission line.

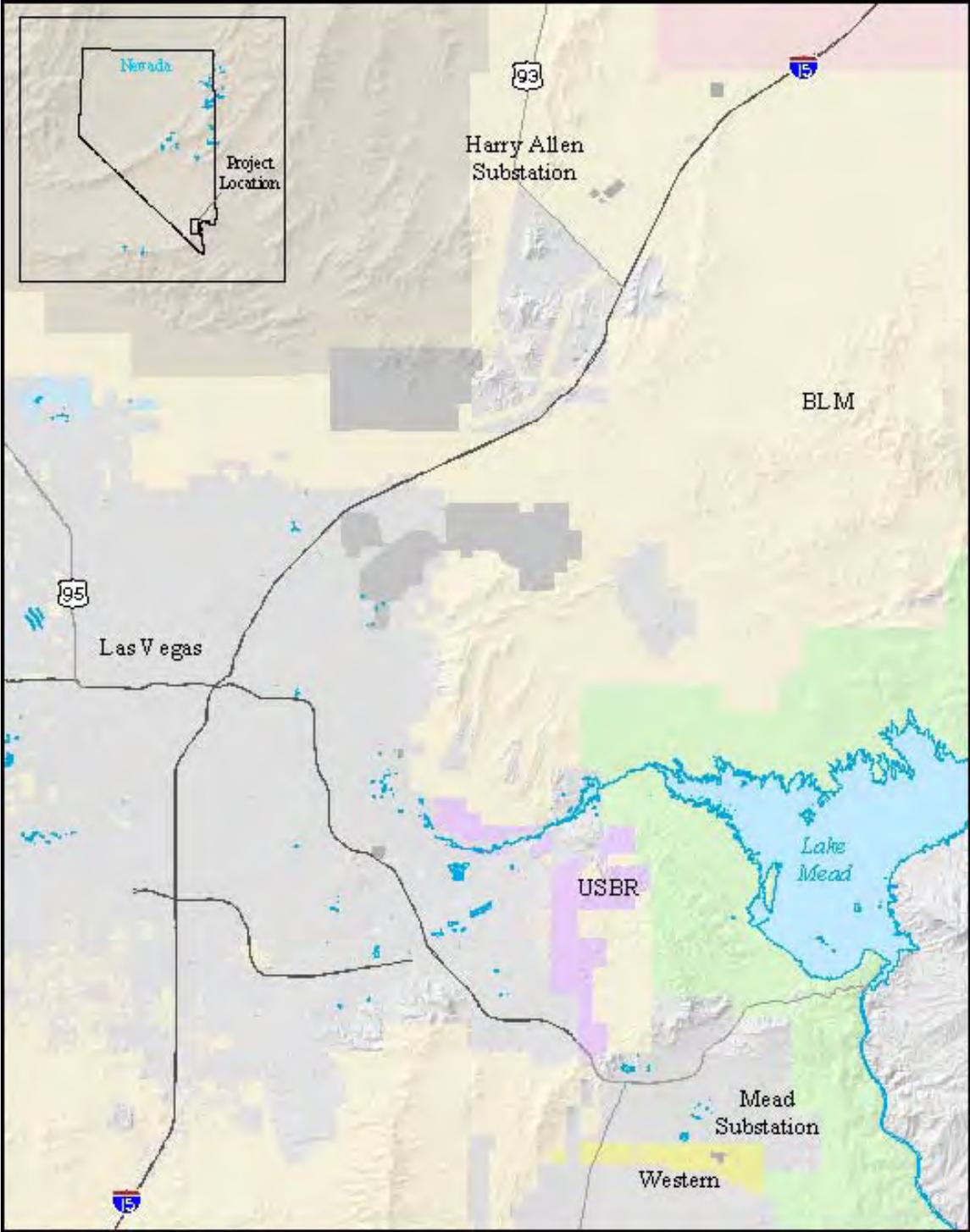


Figure 1-1 General Location of Project Area

1.5 Relationship to Statutes, Regulations & Other Plans

Table 1-1 Authorizations, Permits, Reviews and Approvals

Action Requiring Permit, Approval, or Review	Permit/Approval	Accepting Authority/ Approving Agency	Statutory Reference
FEDERAL			
Right-of-Way over Land Under Federal Management	Right-of-Way Grant	BLM	FLPMA 1976 (PL94-579) USC 1761-1771 and 43 CFR Part 2800
	License	USBR	Acts of June 17, 1902, and August 4, 1939, as amended, and 43 CFR 429
National Environmental Policy Act (NEPA) Compliance to Grant Right-of-Way	Environmental Assessment (EA)	BLM, Western, & USBR	NEPA, CEO 40 CFR Part 1500-et.seq.
Grant of Right-of-Way by BLM Grant of License by USBR Letter of Permission Western	National Historic Preservation Act Compliance (Section 106)	State Historic Preservation Office	National Historic Preservation Act of 1966, 36 CFR Part 800, 16 USC 47
Grant of Right-of Way by BLM Grant of License by USBR Letter of Permission Western	Endangered Species Act Compliance by BLM and by FWS Biological Assessment Biological Opinion	U.S. Fish and Wildlife Service (FWS)	Endangered Species Act of 1973 Section 7 Consultation, 50 CFR, Part 17, 16 USC 1539, as amended
Tower location and height relative to air traffic	“No Hazard Declaration” required if structure is more than 200 feet in designated airport areas	Federal Aviation Administration (FAA)	49 USC 1501 14 CFR Part 77
Dredge or fill activities in waters of the United States	Clean Water Act Section 404 Permit	U.S. Corps of Engineers	33 USC 1344
Crossing Western’s withdrawal lands	Special Use Permit or Right-of-Way Agreement	Western	The Reclamation Act, Act of June 17, 1902, 32 Stat. 388 and Department of Energy Organization Act, Aug.4, 1977, 91 Stat. 565
STATE OF NEVADA			
Construction of Utility Facilities	Utility Environmental Protection Act – Permit to Construct	Nevada Public Utility Commission	NRS704.860 NAC703.420
Conditional permit for disturbance or destruction of critically endangered plants		Nevada Division of Forestry	NAC527. 17
Impacts to water quality associated with discharges of dredged or fill materials in waters of the U.S.	401 Water Quality Certification, Clean Water Act	Nevada Division of Environmental Protection	33 USC 1344
Permits construction activities for the project that would result in the discharge of stormwater to waters of the state	General Discharge Permit for Stormwater Associated with Construction Activity	Nevada Bureau of Water Pollution Control	40 CFR Section 122.26(b)(14)
LOCAL			
Construction and Operation	Special Use	Clark County Board of Commissioners	Clark County Zoning Ordinance

Action Requiring Permit, Approval, or Review	Permit/Approval	Accepting Authority/ Approving Agency	Statutory Reference
Construction and Operation	Special Use	City of Henderson Board of Commissioners	City of Henderson, Development Code
Construction/Fugitive Dust – PM10	Dust Control	Clark County Department of Air Quality Management	Clean Air Act of 1977 and Amendments NRS 321.001, 40 CFR Subpart C, 42 USC 7408, 42 USC 7409

Chapter 2

Alternatives Including the Proposed Action

2.1 Introduction

Five general alternatives including the Proposed Action were evaluated to meet the purpose and need to increase the reliability and capacity of the transmission system to the Las Vegas Valley and the western United States. These alternatives are listed as follows:

- No Action
- Proposed Action
- Siting Alternatives
- Alternative Transmission Technologies
- Energy Conservation and Load Management

The Proposed Action and the no-action alternative are discussed in Section 2.2 as alternatives evaluated in detail. The remaining three alternatives are discussed in Section 2.3, Alternatives Considered but Eliminated.

2.2 Alternatives Evaluated in Detail

2.2.1 No Action

The no-action alternative is required under the National Environmental Policy Act (NEPA) and by the Council of Environmental Quality (CEQ) regulation (40 CFR 1500-1508). Under the no-action alternative, the facilities to increase transmission capacity would not be constructed. The no-action alternative would not meet the purpose and need of the Proposed Action.

If the no-action alternative were selected, Nevada Power would most likely be required to take additional measures to compensate for the anticipated shortfall in the supply of electric power for the Las Vegas Valley. Additionally, Nevada Power is mandated by the Federal Energy Regulatory Commission (FERC) to provide reasonable transmission access to the competing independent power providers in and around the Las Vegas Valley. The no-action alternative would not meet this requirement nor would it fulfill the Refiled 2001 Resource Plan approved by the Public Utility Commission (PUC).

2.2.2 Proposed Action

Nevada Power has developed the Proposed Action scenario to provide the best balance of objectives including 1) needed power capacity, 2) use of existing utility corridors to minimize environmental impacts, and 3) design/construction techniques to avoid unnecessary costs for the proposed project. This balance was conceived to provide an action and transmission route that would be acceptable to local administrative agencies with jurisdiction over the project and the affected public. The Proposed Action meets the

active fibers and 12 inactive fibers reserved for emergency spares. There would be no in-line amplifiers or warning markers. If cable repairs would need to be made, splicing vaults would allow for repairs. Splice vaults probably would be buried at the bottom of the transmission structures, but also could be box-mounted on the side of the structures. Re-generation facilities would not be required. Nevada Power would have sole ownership and use of the fiber optic line.

Right-of-Way Acquisition

New land rights for the transmission line right-of-way, temporary work areas and permanent access roads would be required for the transmission line. Nevada Power is requesting a grant of right-of-way from BLM for transmission line facilities located on BLM-managed public lands, a grant of license for the portion of the transmission line managed by USBR, and a license agreement from Western for those lands under its management. Rights-of-way for transmission line facilities on private lands would be obtained as perpetual easements. Every effort would be made to purchase the land and/or obtain easements on private lands through reasonable negotiations with the landowners. Land rights would be obtained in the name of Nevada Power.

Right-of-Way and Line Crossings

The Proposed Action would require crossing existing transmission lines, railroad tracks and highways owned and/or managed by Nevada Power, Western, Nevada Department of Transportation (NDOT), BMI Basic Management Inc. (BMI), Union Pacific, Colorado River Commission (CRC), Los Angeles Department of Water and Power (LADWP) or Southern California Edison (SCE). Refer to Table 2-2 for information regarding these crossings.

The location of existing transmission facilities relative to final transmission routing, topographical constraints and any utility corridor boundary constraints that may exist would dictate the number and location of crossings. The proposed line crossings have been coordinated with each property owner or manager. Nevada Power would have letters of agreement in place for all crossings.

Table 2-2 Transmission Line, Railroad and Highway Crossings

Configuration	Crossing Type			Crossing Owner/Manager
	Transmission Lines	Railroad Tracks	Highways	
Single Circuit Mileposts 1-19	Harry Allen-Unit #3 230kV			Nevada Power
	Reid Gardner-Harry Allen #2 230kV			Nevada Power
	Reid Gardner-Harry Allen #1 230kV			Nevada Power
	Utah Tie Line 345 kV			Nevada Power
	Crystal-Harry Allen #3&4 230kV			Nevada Power
	Crystal-Harry Allen #1&2 230kV			Nevada Power
			I-15	NDOT
		RR @ MM 3.6		Union Pacific

Configuration	Crossing Type			Crossing Owner/Manager	
	Transmission Lines	Railroad Tracks	Highways		
		RR @ MM 15.4		Union Pacific	
	NCA2 69kV			Nevada Power	
Double Circuit Mileposts 19-37			Lake Mead Hwy 147	NDOT	
	Intermountain DC 500kV			LADWP	
	Navajo-McCullough 500kV			LADWP	
			Lake Mead Hwy 146	NDOT	
	BMI 69kV			BMI	
	Newport-Foothills 69kV			CRC	
	Lindquist-Mead 69kV			Nevada Power	
	Las Vegas #3 69kV			Nevada Power	
	Las Vegas #1 69kV			Nevada Power	
	Newport-Mead #1 230kV			CRC	
	Equestrian-Mead #1 230kV			Nevada Power	
	Hoover-Henderson 230kV			Western	
	Newport-Mead #1 230kV			CRC	
	Equestrian-Mead #1 230kV			Nevada Power	
			Hwy 95	NDOT	
	Henderson-Mead 230kV			Western	
	Single Circuit Mileposts 37-40		RR@ MM 35.5		Union Pacific
		Navajo-McCullough 500kV			LADWP
Intermountain DC 500kV				LADWP	
Mead-Decatur 230kV (2)				Nevada Power	
*Mead-Winterwood 230kV (2)				Nevada Power	
			Hwy 95	NDOT	
Hoover #2 230kV				SCE/Western	
Hoover #3 230kV				SCE/Western	
Newport-Mead #1 230kV				CRC	
Equestrian-Mead #1 230kV				Nevada Power	
Las Vegas #2 69kV				Nevada Power	
Las Vegas #1 69kV				Nevada Power	
Henderson-Mead 230kV			Western		
Hoover #6 230kV			LADWP/Western		
Hoover #7 230kV			LADWP/Western		
Hoover #8 230kV			LADWP/Western		
Marketplace-Mead 500kV			Western		

* No Construction at Mead-Winterwood crossing from January-July to avoid impacts to bighorn sheep.

Lakes Las Vegas Crossing

Topography at the proposed crossing under two existing 500kV lines just south of the Las Vegas Wash would require excavation for an electrical safety clearance between the proposed conductors and the ground of approximately 31 feet as required by national code. The crossing is located at approximately milepost 37, entirely on land that is currently administered by the BLM but is under contract for purchase by the Lakes Las Vegas Resort development. Nevada Power has requested an increase to 400 feet for the right-of-way in this area to accommodate the three poles required for a horizontal crossing under these existing lines.

The land identified for the transmission line crossing is adjacent to ongoing development by the Resort, a major Henderson thoroughfare (Magic Way) and SNWA for their second-source water pipeline. The area is highly disturbed with numerous roads, piles of soil and trails.

BLM has agreed to sell land that had been previously slated for exchange to Lakes Las Vegas Resort. The area required for crossing under the existing lines is included in this land sale. The Resort placed a down payment in October 2003 and plans to close on the property within their allocated 180 days (D. Rainey, Lakes Las Vegas Resort, Personal Communication, October 2003). The Resort plans to install a driving range and other resort amenities and would utilize excess material from grading operations. According to Lakes Las Vegas representatives, the excavation required for the transmission line crossings would be consistent with their planned excavation and would be in place prior to the start of construction to meet the needs of the Resort. The Resort has agreed to incorporate the excavation specifications required by Nevada Power to meet safety clearances in the designs for this area. A Memorandum of Understanding is being developed between the Resort and Nevada Power to ensure the cooperation and understanding of both parties. The Resort would obtain the appropriate permits for the excavation work.

In the unlikely event that the property is not purchased by the Resort, Nevada Power would be required to perform the necessary excavation for the transmission line crossings. Excavation for the 500kV transmission line crossing would consist of grading to remove earth materials underneath the two existing transmission lines within the proposed 400-foot corridor. The general shape of the excavation would follow the profile of the proposed line conductors producing a scalloped shaped depression approximately 750 feet long and 300 feet wide. Impact to the existing natural drainage patterns would be minimal and limited to the periphery of the broad, flat wash east of the site. Appropriate permits would be obtained from Henderson and Clark County to ensure compliance with stormwater and drainage regulations. Refer to Figure 2-5 for a preliminary grading plan created by Nevada Power for the crossing site.

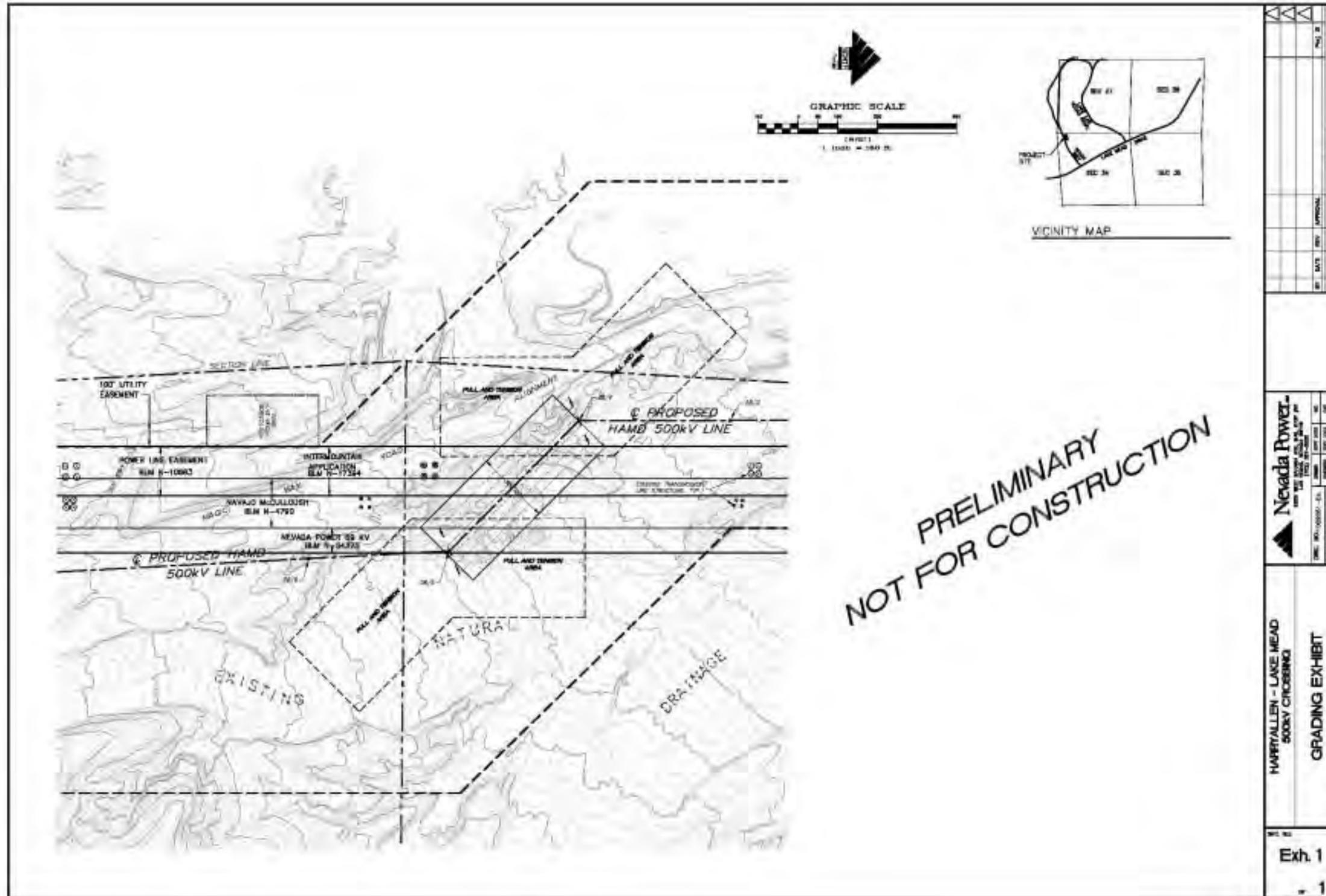


Figure 2-5 Lakes Las Vegas Crossing Site

Harry Allen Generation Interconnection

In order to obtain sufficient clearance for the Harry Allen–Mead 500kV circuits to cross over the existing 230kV transmission lines that connect the Harry Allen Generation Station to the existing Harry Allen 230kV Substation, Nevada Power would have to remove one double circuit 230kV structure and install two, single circuit, H-frame structures and associated hardware. The area around this structure is highly disturbed from previous work around the Harry Allen Generation Station and the Harry Allen Substation. The work would need to be completed prior to start of construction on the Proposed Action, anticipated to be mid-2005.

Nevada Power would apply to amend the right-of-way grant for this 230kV transmission line (N12873) and follow the mitigation and stipulations identified with that right-of-way grant. All work would be confined to the existing 100-foot right-of-way and the proposed Harry Allen–Mead right-of-way.

Equestrian-Mead/Newport-Mead 230kV

These two 230kV transmission lines are supported on double circuit lattice towers, with the Equestrian-Mead line owned and operated by Nevada Power and the Newport-Mead line owned and operated by the Colorado River Commission (CRC)/Southern Nevada Water Authority (SNWA). The Harry Allen–Mead 500kV circuits would cross over the 230kV circuits. In order to meet required code clearances, the double circuit 230kV line must be lowered. Nevada Power proposes to remove one 230kV double circuit lattice tower and install four shorter, single-circuit 230kV tubular steel structures.

All work would be confined to the 230kV Equestrian-Mead/Newport-Mead 130 foot right-of-way and the expanded right-of-way proposed for the Harry Allen–Mead crossing at this location. The crossing would be coordinated with CRC/SNWA.

The work would need to be completed prior to start of construction on the Proposed Action, anticipated to be mid-2005. Nevada Power would apply for an amendment to the Contract and Grant of Easement from USBR, No. 9-07-30-L0493. Nevada Power would comply with the mitigation and grant stipulations identified with that document.

Management Practices for Safety and Environmental Protection

Linear electric infrastructure projects typically traverse multiple jurisdictional boundaries, natural resource features and wildlife habitat types. Until final design and in some cases until installation, utility projects necessarily remain more flexible in the definition of their ultimate configuration and placement than most non-linear projects. The majority of the Proposed Action is within BLM jurisdictional boundaries and would encounter unique geographical and natural features along the route, such as valuable natural and wildlife resources, soil conditions and engineering hurdles. These unique features often require utility projects to modify or adjust final design during the installation phase in order to maximize overall project feasibility, while avoiding or minimizing impacts to sensitive environmental resources. This flexibility is part of the reason linear utility projects have, in general, the potential to result in far fewer impacts to the environment than most non-linear projects.

The Proposed Action incorporates certain management practices to minimize impacts to the environment and improve safety conditions, as described in Table 2-3, below. Management practices and any mitigation measures determined necessary would be detailed in the Final Plan of Development and included in the agency authorization documents.

Table 2-3 Proposed Management Practices for Safety and Environmental Protection

1.	An independent third-party contractor would be hired to oversee compliance with the stipulations of this project. All questions or concerns regarding compliance shall be directed to the BLM as the lead agency through this third-party compliance contractor.
2.	All construction vehicle movement outside the right-of-way on dirt roads normally would be restricted to predesignated access or contractor-approved access. Should unforeseeable circumstances occur during construction that require more road access than initially requested, permission must be granted by the land manager prior to disturbance and appropriate remuneration fees would be assessed.
3.	The aerial limits of construction activities normally would be predetermined with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.
4.	In construction areas where recontouring is not required, vegetation would be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.
5.	In temporary construction areas (e.g., pull and tension sites, structure sites) where ground disturbance is substantial or where recontouring is required, surface restoration would occur as required by the land management agency. The method of restoration normally would consist of removing and stockpiling topsoil and large rocks from disturbed areas to return temporarily disturbed areas back to original contours. Other methods include reseeding (if required), installing cross drains for erosion control, placing water bars in the road and filling ditches.
6.	Existing improvements would be repaired or replaced if they are damaged or destroyed by construction activities to their condition prior to disturbance as agreed to by the parties involved.
7.	Structures and/or ground wire would be marked with highly visible devices where required by governmental agencies (e.g., Federal Aviation Administration).
8.	Prior to construction, all supervisory construction personnel would be instructed on the protection of cultural, paleontological and ecological resources. To assist in this effort, the construction contract would address: (a) Federal, state and tribal laws regarding antiquities, fossils, plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.
9.	Cultural resources would continue to be considered during post-environmental assessment (EA) phases of plan implementation. In consultation with appropriate land managing agencies and state historic preservation officers, specific mitigation measures would be developed and implemented to mitigate any identified adverse impacts. These may include plan modifications to avoid adverse impacts, monitoring of construction activities and data recovery studies.
10.	Nevada Power would respond to complaints of radio or television interference generated by the transmission line by investigating the complaints and implementing appropriate mitigation measures. The transmission line would be patrolled on a regular basis (generally twice annually, once by air and once by ground), so that damaged insulators or other transmission line materials, which could cause interference, are repaired or replaced.
11.	Nevada Power would apply mitigation needed to eliminate problems of induced currents and voltages onto conductive objects sharing a right-of-way to the mutual satisfaction of the parties involved.
12.	Nevada Power would continue to monitor studies performed to determine the effects of audible noise and electrostatic, electric and magnetic fields.
13.	Roads would be built at right angles to the washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation and drainage channels. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.

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14. 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 would not be allowed.

 15. Fences and gates would be repaired or replaced to their original condition prior to disturbance as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land management agency and, if required, would be restored to original condition prior to disturbance following construction.

 16. A bundle configuration and large diameter conductors would be used to limit the audible noise, radio interference and television interference due to corona. Tension would be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution would be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.

 17. No nonbiodegradable debris would be left in the right-of-way.

 18. Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage and other solid waste, petroleum products and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials by the proponent or their agent.

 19. Fueling of vehicles would take place outside of the 500kV transmission line right-of-way.

 20. Workers would be instructed not to drive or park vehicles where catalytic converters can ignite dry vegetation and to exhibit care when smoking in natural areas. Fire protective mats or shields would be used during grinding or welding. Vehicles would carry water and shovels or fire extinguishers during times of high fire hazards.

 21. Non-specular conductors would be used to reduce visual impacts.

 22. The contractor would use weed-free, native seed mixes if revegetation were required. No species on the "state noxious weed list" would be included in the revegetation seed mixes.

 23. All vehicles brought in from out of state would go through high pressure washing prior to arriving on site and before they can be used on the project.

 24. In compliance with Clark County and the Federal Clean Water Act, all necessary permits relating to water resources would be obtained.

 25. In compliance with the Clark County Department of Air Quality Management (DAQM) dust permit, all roads and structure pads would be watered prior to and during all construction activities. All project personnel would be educated on the site dust mitigation plan.

 26. Construction and operation vehicles would be properly maintained to reduce emissions.

 27. A speed limit of 25 mph is required on the project site at all times.

 28. All appropriate NDOW and FWS permits must be obtained prior to initiation of the project

 29. In observance of NRS 503.597 and other applicable NRS and Nevada Administrative Codes, measures, and actions (including mitigation) concerning wildlife not under joint purview of the FWS and Nevada Division of Wildlife, would be reviewed by the Nevada Division of Wildlife.
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Construction

Construction of a transmission line follows the sequence of surveying the centerline, access road construction, installing foundations, assembling and erecting the structures, installing ground wires and conductors, installing ground rods/counterpoise, and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process and in some cases at the same time at different locations. Typical transmission line construction activities are depicted in Figure 2-6. The estimated number of workers and types of equipment required to construct the proposed transmission line is shown in Table 2-4, at the end of the construction discussion.

Surveying Activities

Construction survey work would consist of identifying the centerline location, structure center hub and right-of-way boundaries, where dictated by the Federal land manager. These activities normally would begin prior to the start of construction but after approval from Federal land managers.

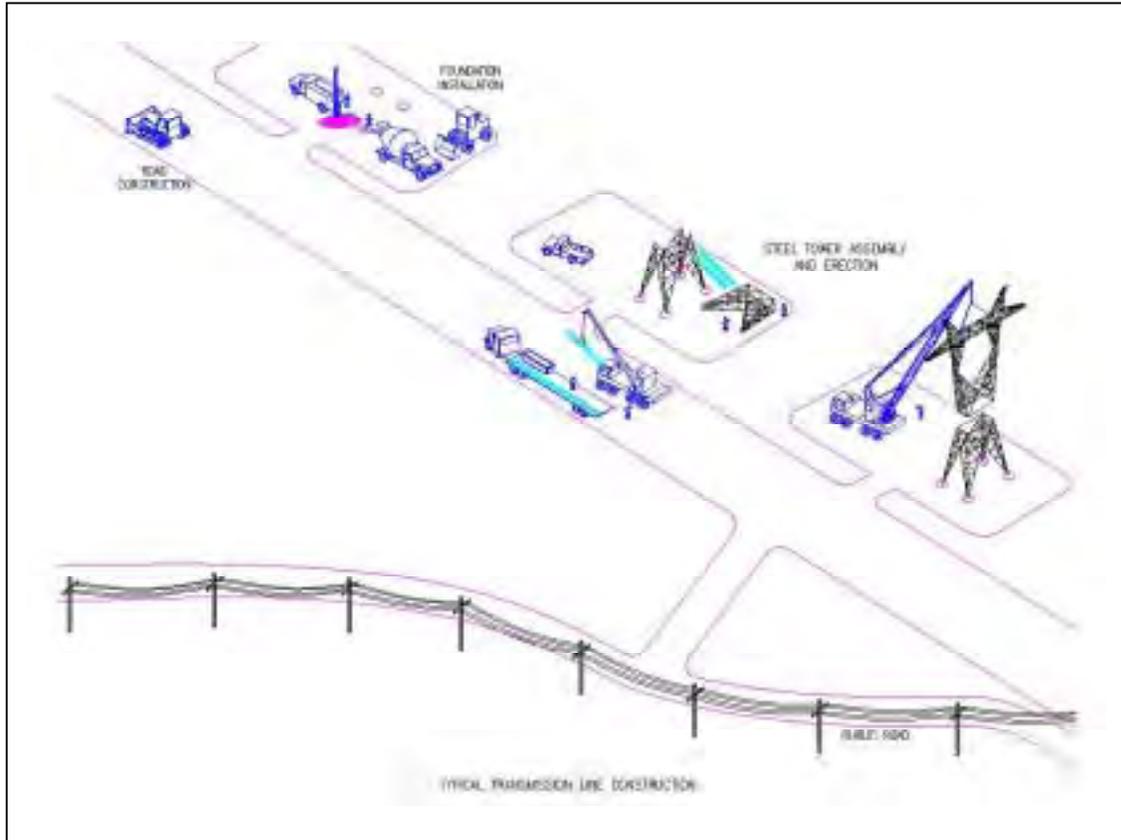


Figure 2-6 Typical Transmission Line Construction Activities

Access Road Construction

Surface access is required to each transmission structure. Because the Proposed Action falls mostly within a transmission corridor, existing transmission line access roads are readily available and would be utilized wherever practical, thus keeping new access roads to a minimum. Where access roads currently exist, short roads would be graded from existing transmission line roads to the structure locations. Approximately one mile of new or improved road would be required for each mile of transmission line where no access roads currently exist.

Some portion of the existing road network would likely require maintenance or upgrading. This maintenance or upgrading may involve clearing overgrown vegetation, re-grading and/or installation of drainage structures. Typically, access roads would be constructed or improved to a 20-foot-wide travel area with two feet of berm on each side. New roads would meander to avoid sensitive plants and wildlife habitat features. In some steeper terrains, existing roads cannot be widened. Therefore, to avoid creating additional

disturbance, turnout and passing of vehicles/equipment would occur in previously disturbed areas along the roadways or at structure sites.

The number of new roads would be consistent with their intended use and would be part of the permanent right-of-way for maintenance. Because the exact location of roads cannot be determined until final design of the transmission line, the specific information on total miles and location of new and improved roads would be provided as part of the Final Plan of Development.

Work Areas

A temporary work area approximately 200 by 200 feet (right-of-way width) would be required for the location and assembly of structures, the necessary crane maneuvers and to facilitate the safe operation of equipment at most structure sites. Within these temporary work areas, an area of 100 by 100 feet (0.2 acres) would be retained as a permanent structure location for future maintenance access. The work area would only be cleared of vegetation as necessary. In general, existing brush and vegetation would be crushed rather than cleared in order to foster its regeneration.

A larger permanent work area would be required for approximately 30 structure locations that are located in steep terrain. These steeper areas would require a 250 by 200 feet work area to accommodate the necessary grading and crane equipment for construction and maintenance.

The transmission line crossing sites would require larger temporary work areas to accommodate construction of the two- and three-pole structures. The temporary work areas would be up to 400 by 200 feet and the permanent structure locations would be 300 by 100 feet.

After line construction, all work areas not needed for normal transmission line maintenance would be recontoured as necessary to blend with the natural slopes.

Clearing Right-of-Way

The clearing of natural vegetation is not anticipated for the transmission line but may be required in some specific cases. Selective clearing would be performed only when necessary to provide for surveying, electrical clearance, line reliability and construction and maintenance operations. Rights-of-way would not be chemically treated unless necessary to comply with requirements of a permitting agency.

Foundation Installation

Excavations for foundations would be made with power auger and backhoe-type equipment. Where the soil permits, a vehicle-mounted power auger or backhoe would be used. Spoil material would be used for fill where suitable. The foundation excavation and installation requires equipment access to the foundation sites. In rocky areas, foundations may be excavated by drilling and blasting and may require special rock anchors to be installed.

Where blasting is required, safeguards such as blasting mats would be employed when needed to protect the adjacent property. All applicable state, local and Federal laws would be followed and copies of required permits would be forwarded to the land

managers. Stipulations would be followed relating to protection of desert tortoise as well as notification to appropriate fire officials at BLM, USBR, Western and Clark County.

In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation. After excavations are completed, cast-in-place concrete footings would be installed by placing reinforcing steel in the excavated foundation hole and encasing it in concrete. Concrete for use in constructing foundations would be obtained commercially.

Foundation holes left open or unguarded would be covered and/or fenced where practical to protect the public and wildlife. Soil removed from foundation holes would be stockpiled on the work area. These piles would be used to backfill holes and the topmost layer would be distributed over the work area. To wash concrete chutes, a hole would be dug in the center of the permanently disturbed 100 by 100-foot structure location site. The first six inches of topsoil would be placed on one side of the hole and the remainder of the soil on the other side. The chute would be washed into the hole and the soil would be replaced in the same order it was removed, thereby salvaging the seed bank

Construction Yards

Existing fenced and graded Nevada Power property would be used to the maximum extent for construction staging and personnel reporting. Temporary construction yards would be located at the existing substations, pulling and tensioning sites, other previously disturbed areas or private property areas, depending on which is more feasible. Because the location of these sites cannot be determined until final transmission line design is completed, they would be identified on the Final Plan of Development prior to the start of construction. Concrete for use in constructing foundations would be available from commercial sources in the Las Vegas area; therefore, no remote batch plants would be anticipated.

Tower Assembly and Erection

Bundles of lattice steel members or pole sections and associated hardware would be shipped to each structure site by truck. Structures would be assembled into subsections of convenient size and weight. The assembled subsections would be hoisted into place by a large crane and then fastened together to form a complete structure. Table 2-4 estimates the typical equipment and personnel necessary to assemble and erect transmission structures.

Guard Structures

For public safety and property protection during wire installation, temporary guard structures would be erected over highways, railroads, power lines, structures and other obstacles. Guard structures normally consist of H-frame structures placed on either side of an obstacle. Construction would require a temporary work area of 100 by 100 feet. These structures are designed to prevent ground wire or conductor from contacting an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers and cranes. Guard structures may not be required for small roads. On such occasions, other safety measures such as barriers, flagmen or other traffic control would be used.

Conductor Installation

After the structures are erected, insulators, hardware and stringing sheaves would be delivered and installed at each structure site to accommodate the installation of conductor and/or ground wire.

Pilot lines would be pulled (strung) from structure to structure and threaded through the stringing sheaves. A large diameter pulling line is then attached to the pilot line and strung. The pulling line would be attached to the conductor/ground wire and used to pull the conductor and ground wire through the sheave. This process would be repeated until the ground wire or conductor would be pulled through all sheaves.

Ground wire and conductor would be installed under controlled tension using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. The tensioner in concert with the puller would maintain tension on the ground wire or conductor. Maintaining tension maintains ground clearance and would be necessary to avoid damage to ground wire, conductor or any objects below them during the stringing operation.

Sites for tensioning equipment and pulling equipment would require an area of approximately the right-of-way width by 700 feet. A tensioner, line trucks, wire trailers and tractors would be needed for stringing and anchoring the ground wire or conductor at the tensioning site. Pullers, trucks and tractors would be needed for pulling and for temporarily anchoring the ground wire and conductor at the pulling site (as shown in Figure 2-7). When construction occurs in steep and rough terrain, these sites would require larger, less symmetrical pulling and tensioning sites. These sites would be identified on the structure location drawings submitted with the Final Plan of Development.

Helicopter Use

Helicopters would be used to move personnel and equipment (e.g., pulling lines, assembling structures, installing marker balls, etc.). Helicopters would set down only in previously surveyed areas identified as temporary work areas.

Spill protection measures would be in place and all Federal Aviation Administration regulations would be followed. Notification would be made to coordinate the air space with other possible helicopters in the area being used for seeding, fire support, military maneuvers or other use.

Counterpoise

Structure footing resistance along the route would be measured as part of standard construction practices prior to wire installation. When the resistance to remote earth for each transmission structure would be greater than 25 ohms, counterpoise (grounds) would be installed to lower the resistance to 25 ohms or less. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of lattice towers) for approximately 200 feet within the right-of-way.

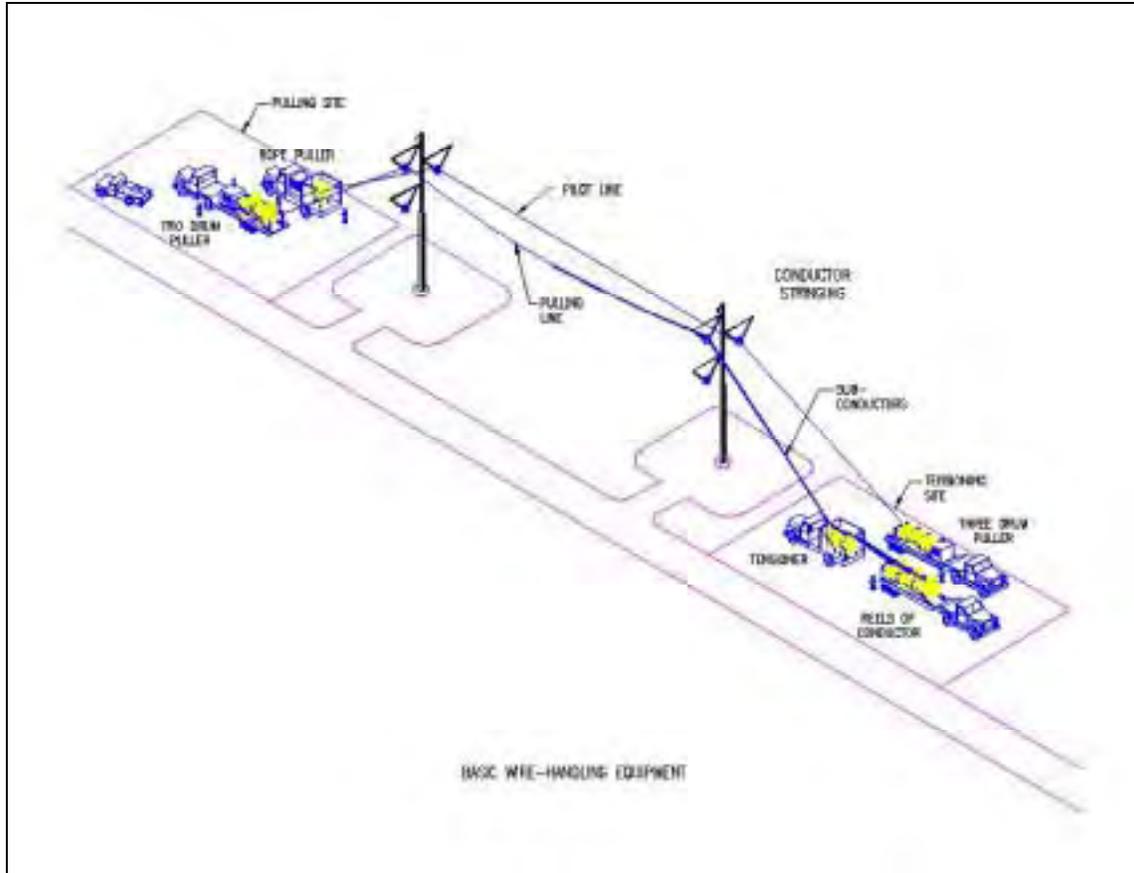


Figure 2-7 Basic Wire Handling Equipment

Cleanup and Reclamation

Construction sites, material storage yards and access roads would be kept in an orderly condition and free of trash throughout the construction period for the Proposed Action. Refuse and trash would be collected at the temporary construction yards in a closed container and would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the construction areas. Waste oils or chemicals would be hauled to an approved site for disposal. No open burning of construction trash would occur. The right-of-way for the Proposed Action would be restored as identified in an agency-approved Restoration Plan submitted as part of the Final Plan of Development.

Hazardous Materials Handling

Petroleum products such as gasoline, diesel fuel, helicopter fuel, crankcase oil, lubricants and cleaning solvents would be present within the right-of-way during construction activities. These products would be used to fuel, lubricate and clean vehicles and equipment. These products would be stored in fuel trucks or approved containers. When not in use, hazardous materials would be properly stored to prevent accidental releases.

Totally enclosed containment would be provided for all trash. Spill kits would be on site and diapers would be placed under leaking equipment immediately to prevent ground contamination. All construction waste, including trash and litter, garbage or solid waste,

petroleum products and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.

All construction, operation and maintenance activities would comply with all applicable Federal, state and local laws and regulations regarding the use of hazardous substances. The construction or maintenance crew foreman would be responsible for maintaining compliance with all applicable laws and regulations. In addition, an onsite inspector would be present during construction to make sure all hazardous materials are used and stored properly. A handling plan would be developed as part of the Plan of Development during the engineering and pre-construction phase of the transmission line.

Fire Protection

All applicable fire laws and regulations would be observed during the construction period. All personnel would be advised of their responsibilities under the applicable fire laws and regulations.

Construction Monitoring

A resource compliance program would be developed with appropriate agencies to address mitigation requirements associated with the avoidance of sensitive plant and animal species, cultural sites or other sensitive features located within or adjacent to the Proposed Action. Resource protection measures committed to by Nevada Power for this Proposed Action are described in Table 2-3. Prior to construction, these measures would be described in detail, as required and included in the Final Plan of Development.

Operation, Maintenance and Abandonment

Operational Characteristics

The nominal voltage for the Proposed Action would be 500kV AC. There may be minor variations of up to 5 percent above the nominal level, depending upon load flow.

Permitted Uses

After the transmission line has been energized, land uses compatible with safety and local regulations would be permitted in and adjacent to the right-of-way. Existing land uses such as agriculture and grazing are generally permitted within the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Compatible uses of the right-of-way on public lands would have to be approved by the managing Federal agency. Permission to use the right-of-way on private lands would have to be obtained from Nevada Power.

Safety

Safety is a primary concern in the design of this 500kV transmission line. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the substation would be

grounded. All fences, metal gates, pipelines, etc. that cross or are within the transmission line right-of-way would be grounded to prevent electrical shock. If applicable, grounding outside the right-of-way may also occur.

Right-of-Way Maintenance

Nevada Power would maintain the right-of-way in accordance with Federal land managers' stipulations. The Harry Allen–Mead 500kV Transmission Line would be inspected semi-annually by ground and air patrols. Maintenance would be performed as needed. When access is required for non-emergency maintenance and repairs, Nevada Power would adhere to the same precautions taken during the original construction.

Emergency maintenance would involve prompt movement of crews to repair or replace any damage. Crews would be instructed to protect plants, wildlife and other environmental resources. Restoration procedures following completion of repair work would be similar to those prescribed for normal construction. Limiting noise, dust and the danger caused by maintenance vehicle traffic provide for the comfort and safety of local residents.

Abandonment

At the end of the useful life of the line, if the facility were no longer required, the transmission line would be abandoned. Subsequently, conductors, insulators and hardware would be dismantled and removed from the right-of-way. Structures would be removed and foundations broken off below the ground surface. If the line and associated right-of-way were abandoned at some future date, the right-of-way would be available for the same uses that existed prior to construction of the line.

Following abandonment and removal of the transmission line from the right-of-way, any areas disturbed to dismantle the line would be restored and rehabilitated as near as possible to their original condition.

Construction Work Force and Schedule

The maximum total work force required to complete the phases of construction described above would be 125 people. Table 2-4 lists the personnel and equipment that would be needed to support the construction activities.

The target date for commercial operation of the Harry Allen–Mead 500kV Transmission Line is January 2007. Right-of-way procurement would begin in 2004 and construction would be scheduled to commence in mid 2005 through 2006.

Table 2-4 500kV Transmission Line Construction – Estimated Personnel and Equipment

Activity	People	Quantity of Equipment	
Survey	4	2	pickup trucks
Road Construction	4-8	1	bulldozers (D-8 Cat)
		2	motor graders

Chapter 2--Alternatives Including the Proposed Action

Activity	People	Quantity of Equipment	
		2	pickup trucks
		2	water trucks (for construction and maintenance)
Footing Installation	28	6	hole diggers
		2	bulldozers
		1	truck
		6	concrete trucks
		2	water trucks
		4	pickup trucks
		1	carry all
		1	hydro crane
		1	wagon drill
Structure Steel Haul	6	4	steel haul trucks
		2	water trucks
		2	yard and field cranes
		1	fork lift
Structure Assembly Per crew HA-Mead= 4 Crews	8/crew	1	pickup truck
		2	carry alls
		1	cranes (rubber tired)
		2	water trucks
		1	truck (2 ton)
Structure Erection Per crew HA-Mead= 1 Crew	6-8	1	cranes (120 Ton)
		1	truck (2 ton)
		2	pickup trucks
		2	water trucks
		1	carry all
Wire Installation	36	6	wire reel trailers
		6	diesel tractors
		4	cranes (2 19-Ton, 2 30-Ton)
		2	trucks (5 ton)
		4	pickup trucks
		2	splicing trucks
		2	water trucks
		4	3-drum pullers (2 medium, 2 heavy)
		1	single Drum Puller (large)
		1	double bull-wheel tensioner (heavy)

Activity	People	Quantity of Equipment	
		2	sagging equipment (D-8 Cat)
		4	carry all
		2	static wire reel trailer
Wire Clean Up	4	3	trucks
		1	pickup truck
		2	water trucks
		1	(D-6 Cat)
Road Rehabilitation (Right-of-Way Restoration)	4	1	bulldozer
		1	motor grader
		2	pickup trucks
		2	water trucks

Maximum total personnel required considering all tasks (actual personnel at any one time would be less)
= 125

Note: Depending on schedule requirements, multiple crews may be required.

2.3 Alternatives Considered But Eliminated

2.3.1 Siting Alternatives

From May to July 2001, a siting study was conducted in the Las Vegas area to determine reasonable and feasible transmission line alignments connecting the Harry Allen Substation to the Mead Substation. Approximately 70 miles of potential links were identified. Each of the links was examined for environmental issues, public acceptability and engineering constraints. Nevada Power met with planning staff from Las Vegas, Henderson, Boulder City and Clark County to discuss issues, concerns and opportunities. Those discussions focused on the respective agencies’ policies and concerns about new or expanded transmission line rights-of-way.

A major concern identified in discussions with agency personnel was avoiding the proliferation of new transmission line rights-of-way by paralleling existing transmission lines and using designated utility corridors as much as feasible. Federal legislation was required to allow the Centennial Plan to utilize a portion of the BLM-designated utility corridor that would cross through the Sunrise Mountain Interim Study Area.

Nevada Division of Wildlife (NDOW) identified another concern regarding the impact to bighorn sheep around the McCullough Mountains in the southwestern portion of the route. This portion of the route is outside the designated corridor. A field visit was conducted with NDOW to identify routing in this area that would minimize impacts to the areas of concern.

Input from the public was gathered at community open house workshops and other formal and informal discussions and presentations (refer to Chapter 5 for details of

meetings/discussions). Data was also obtained from existing informational sources such as:

- Master plan documents from each of the political subdivisions within the study area
- Federal, state and county agency management plans and documents
- GIS data and maps from Clark County, BLM and Nevada Power

Based on information, data and comments collected, criteria were developed to help determine opportunities and constraints for siting alternatives for the 500kV transmission line.

The route was intended to optimize the use of existing utility corridors, minimize environmental impacts and minimize engineering and constructability expense as is defined in Chapter 1, Purpose and Need. Refer to Figure 2-1 for a map of the potential routes assessed. Of the 70 miles of siting identified, Routes A and B were eliminated from further consideration for one or more of the following reasons (Figure 2-1):

1. Impacts, as determined by the siting study, to an existing or planned land use feature or other environmental resource that was determined to be unacceptable to land use plans, local officials and/or the public.
2. Impacts, as determined by the siting study, were similar among the three routes, therefore additional miles would create greater environmental impacts (Alternative A: ~56 miles and Alternative B: ~51 miles) while an “acceptable” shorter alternative link existed (Proposed Route: ~47 miles).
3. Operational issues, engineering constraints and increased costs were identified, while an “acceptable” shorter alternative link existed.

Routes Suggested Through Scoping Process

Eastern Route

During the public scoping process, a route east of Lava Butte was suggested as a potential alternative to the proposed routing (Route C) to lessen visual impacts to hikers using a proposed trail through part of the Rainbow Gardens Area of Critical Environmental Concern (ACEC), specifically the Valley of the Pillars area. Refer to Figure 2-8 for a map illustrating this Eastern Route.

The Eastern Route was considered and eliminated because the line would fall at least one mile outside the designated utility corridor for three to four miles. The line would then border the Lake Mead National Recreation Area and potentially encroach on existing or future development. The Draft Las Vegas Resource Management Plan and EIS analyzed locations for proposed utility corridor locations. Due to public comments received during the 90-day comment period, BLM considered 14 additional corridor locations in a Supplement to the Las Vegas RMP. This Supplement was sent out for a 90-day public comment period in May of 1994. BLM considered 3 alternative corridor locations through the Henderson/Rainbow Gardens/Sunrise area.

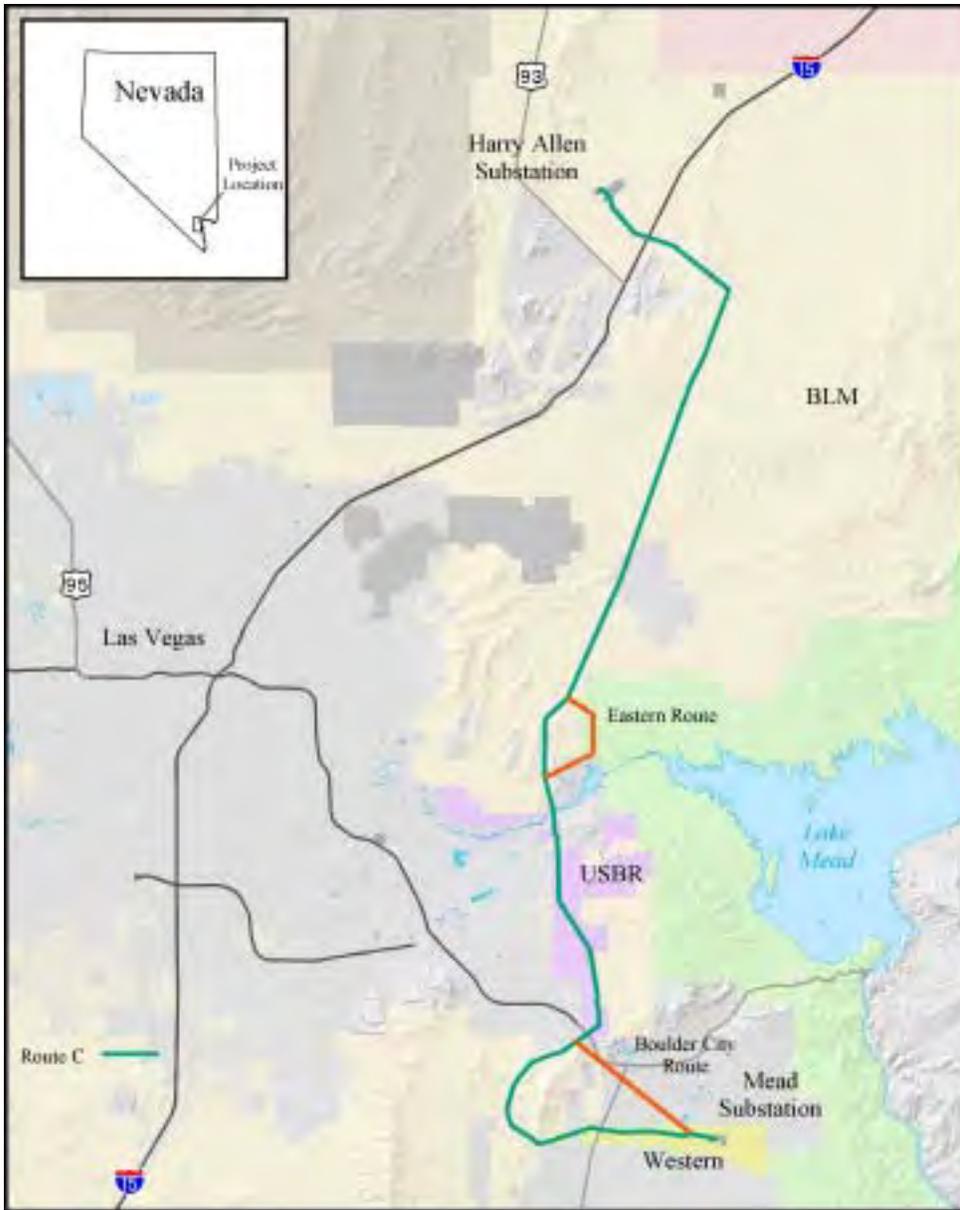


Figure 2-8 Potential Alternatives to Route C

After full consideration of all public comments on the 3 potential routes, BLM designated the utility corridor as it exists today. It is BLM’s position that within the Sunrise Mountain Special Recreation Management Area, no deviation outside the designated corridor should be approved.

As such, the Eastern Route would not meet the BLM Las Vegas RMP (1989) requirements, which is part of the purpose and need for the Proposed Action to utilize existing designated corridors in special management areas.

Boulder City Route

A route crossing through Boulder City was also suggested as a potential alternative to the proposed routing (Route C) during the scoping process. Refer to Figure 2-8. This route was eliminated from further consideration based on overwhelming support expressed by Boulder City elected officials for the proposed project alignment. In recent years, Boulder City development has extended to the west and new transmission lines in the area is of significant concern. In addition, the alternative route introduces conflicts with the Boulder City airport. Also, the proposed alignment, rather than an alignment through Boulder City, better supports the extension of 500kV transmission to the Eldorado/Marketplace/McCullough Substation hub in the future.

2.3.2 Alternative Transmission Technologies

Underground High-Voltage Construction

Nevada Power has considered the option of using 500kV high-voltage underground cable for portions of the proposed transmission line. Comments from public scoping also suggested this alternative be analyzed.

The environmental impact of an underground transmission line would be significantly greater than that of an overhead transmission line. Because of the required number and size of transition sites and trenching, an underground line would cause 30 times to 55 times the permanent ground disturbance of an equivalent overhead line per mile (Jackson, Nevada Power, personal communication, August 2003). The construction of a double-circuit underground transmission line would require a contiguous disturbance. Assuming the width of disturbance is 50 feet, the total permanent disturbance for underground transmission line installation would be 6.0 acres per mile plus an additional 5.0 acres of disturbance for cable termination sites and reactor sites. In addition, the following constraints exist for under-grounding the 500kV transmission line.

- The cost of an underground transmission line would be approximately 16 times greater per mile than an overhead line.
- The reliability of an underground 500kV transmission line is unproven. Currently, there is only one known underground 500kV transmission line in the United States—a relatively short run of cable located within the Grand Coulee Dam facilities on the Columbia River.
- The time required to restore an underground line significantly exceeds the time required to restore an overhead line.

For these reasons, underground installation of 500kV cable was eliminated from further consideration.

Direct Current Transmission

Direct Current (DC) transmission systems are often considered where considerable transmission distances are involved or where a connection between two asynchronous systems is required. The nature of a DC system is such that the overhead transmission structures and conductors are less costly but terminal equipment is more costly. A minimum break-even distance is necessary for the savings in the DC structures and

conductors to equal the extra cost in terminal equipment. While the break-even distance varies widely system to system, line lengths of 400 miles are generally required before DC becomes economically viable. For the Proposed Action, DC transmission would cost four to five times more than the proposed 500kV Alternating Current (AC) transmission line. Therefore, DC was eliminated from further consideration.

Alternative Voltage Systems

Two different 230kV expansion plans, the Northeast Corridor and Northwest Corridor expansions, were studied as a means of increasing the amount of power that could move from Harry Allen south to the Las Vegas Valley and beyond. Four new 230kV lines would be required from Harry Allen along with a multitude of reinforcements to the transmission grid in the Las Vegas Valley.

These detailed studies revealed that the two-230kV options, when combined with the generation capacity from the expected new generation plants, would cause unmanageable fault duty levels throughout the Nevada Power system. Fault duty mitigation measures that were evaluated included changing out breakers to potentially rebuilding entire substations. Because of the substantial cost increase of the fault duty mitigation and the potential of insurmountable implementation barriers, these transmission systems were not considered viable alternatives and were eliminated from further consideration.

2.3.3 Energy Conservation and Load Management

Nevada Power provides a number of energy conservation programs that offer financial incentives for implementing specific, energy-efficiency measures. Nevada Power also provides programs, such as online energy audits and energy conservation tips, to make customers more aware of their energy usage and ways to conserve, as well as a variety of free brochures on improving energy efficiency. While these programs play an important role in placing emphasis on energy and demand savings, these savings are substantially below what would be needed over the coming years to meet the forecasted load.

Load management programs are defined as any program that reduces peak electricity demand or has the primary effect of shifting electric demand from the hours of peak demand to non-peak times. Nevada Power has a voluntary commercial curtailment program and is currently developing a residential air conditioner curtailment program to help alleviate the strains that air conditioning can put on the power supply during peak demand times.

From a transmission system planning perspective, load reduction that results from load management programs could not come close to meeting the reliability requirements and anticipated loads in the Las Vegas Valley or provide access to the interconnected grid. Therefore, energy conservation and load management programs as a sole source were eliminated from further consideration.

Chapter 3

Affected Environment

3.1 Introduction

This chapter describes the environment potentially affected by construction, operation and maintenance of the proposed Harry Allen–Mead 500kV Transmission Line (Proposed Action). The Proposed Action is described in detail in Chapter 2. Potential resource impacts from the Proposed Action and suggested mitigating measures are described in Chapter 4.

The Affected Environment resource sections discuss the conditions in the human, natural and cultural environments that could be affected, directly or indirectly and beneficially or adversely from the construction, operation and maintenance of the Proposed Action. Resources to be included in the environmental studies were identified through internal and external scoping. Key resources include the following:

- Biological (botanical, noxious weeds, wildlife and special-status species)
- Air
- Visual
- Cultural and Ethnographic

In addition to these key resources, other environmental elements were identified as potentially affected by or affecting the Proposed Action and were also assessed:

- Land Use
- Socio Economics
- Public Safety (electric and magnetic fields, hazardous materials)
- Water
- Geology and Soils
- Paleontological Resources

Study corridor widths varied by resource and are identified within each inventory methods section. Refer to the resource maps in Appendix A for more information regarding the location and size of study corridors.

3.2 General Plan Setting

The proposed project follows a route approximately 48 miles south from an area northeast of the Apex Industrial Park, located approximately 15 miles northeast of Las Vegas, Nevada, to near Boulder City, Nevada (Refer to Appendix A, Map 1: Proposed Alignment). The proposed project falls entirely within Clark County and is a mixture of Federal and state public lands and private property. The proposed project also crosses the cities of Henderson, Boulder City and Las Vegas. Public land administered by the Bureau

of Land Management (BLM) is located throughout the plan area. Other public lands within the plan area are managed by the United States Bureau of Reclamation (USBR), Western Area Power Administration (Western), University of Nevada, Las Vegas (UNLV) and Clark County.

3.3 Key Resources

3.3.1 Botanical Resources

Introduction

The botanical resources of the plan area are classified as either sensitive or non-sensitive species. Federal and state governments protect many of these resources. The U.S. Fish and Wildlife Service (FWS) maintains the list of species protected by the Endangered Species Act. This list classifies species that are endangered, threatened, proposed threatened and candidate by the FWS. Plants protected by the Nevada Division of Forestry (NDF) are considered state sensitive by BLM. A letter was received from FWS on March 12, 2003 (File No. 1-5-03-SP-478) identifying federally listed species and Nevada species of concern that may be present within the proposed project area. The list of threatened, endangered and candidate species within the project area had not changed as of September 18, 2003 (LaVoie, September 2003, Personal Communication).

Botanical Inventory Methods

Botanical surveys in the plan area, including field surveys conducted in spring/summer 2002 and previous surveys for projects in the immediate and adjacent areas (Knight & Leavitt 2001, 2003), were used for this analysis. The 2002 surveys were conducted within a one-half-mile-wide corridor.

The Multi-Species Habitat Conservation Plan (MSHCP) was reviewed to identify species with the potential for being affected by the Proposed Action (FWS, 2001). As signatories to the MSHCP, the BLM is committed to managing affected species by developing protective measures to minimize impacts to species from human activities and to ensure long-term conservation to prevent future listing.

Technical information was requested from the Nevada Natural Heritage Program database (NNHP, 2002). The results were used to develop information on the botanical resources in the plan area. Other data sources used were previous studies for Nevada Power (Knight & Leavitt, 2001) and BLM management plans for the plan area.

Data from the NNHP were plotted onto 7.5-minute topographic maps. Vegetation communities, cover types and special status species information can be found on Map 2: Biological Resources in Appendix A. In addition, gypsum soils are shown on the map to indicate potential areas for gypsum-associated plants.

Botanical Inventory Results

General Description of Plan Area

Typically, the plan area has hot, dry summers and cool, dry winters. Rainfall is less than five inches per year. Topography in the vicinity of the plan area varies with features such as alluvial fans, sand blown flats, badlands, desert pavements, limestone and volcanic rock bluffs bisected by a large number of ephemeral drainages. Much of the plan area from milepost 14 south to the Mead Substation has gypsiferous soils, which are known to provide potential habitat for a suite of gypsum endemic plants including Las Vegas bearpoppy and sticky ringstem.

Much of the plan area has vegetation typical of the lower elevations of the Mojave Desert. The flora and communities of the lower Mojave Desert are characterized by great diversity, and only half of its 545 plant species also occur in the Sonoran Desert (Vasek and Barbour 1990). Vegetation types collectively referred to as Mojave Desert scrub include: creosotebush scrub, saltbush scrub, shadscale scrub, blackbrush scrub, Joshua-tree woodland and annual vegetation.

The only riparian plants occurring in the plan area are closely associated with the Las Vegas Wash. The dominant riparian plant species identified in this area was saltcedar (*Tamarisk ramosissima*). Saltcedar is a noxious wetland species that can grow from from 5 to 20 feet tall. Seedlings establish in soils that are seasonally saturated. Refer to Map 2: Biological Resources in Appendix A for the location of these riparian plants.

Plant communities located in the smaller washes included desert willow (*Chilopsis lenearis*) and cheese weed (*Hymenoclea salsola*). Cacti such as strawberry hedgehog (*Echinocereus engelmannii*) and beavertail cactus (*Opuntia basilaris*) were also present in some of the drainages.

Species of Concern

While the list obtained from FWS identified that no listed threatened, endangered or candidate plant species occur in the plan area, there are several species of concern that have the potential to occur in the plan area. Species of concern is a term that refers to those species the FWS believes might be in need of concentrated conservation actions. A species may also be considered state sensitive or protected by the BLM and NDF. Nevada state protected species are categorized by NDF as 1) critically endangered, 2) recommended for listing as critically endangered, or 3) protected as a cactus, yucca or Christmas tree. The BLM also considers any plants given special status by the MSHCP as sensitive. Table 3-1 lists the plant species of concern with the potential to be located in the plan area along with the corresponding Federal and state protection status.

Table 3-1 Plant Species of Concern That May Occur Within the Plan Area

Species of Concern	Common Name	BLM Status	NDF State Status	FWS Status	MSHCP Status
<i>Anulocaulis leioselinus</i>	sticky ringstem	none	none	none	covered
<i>Arctomecon californica</i>	Las Vegas bearpoppy	special status-state sensitive	critically endangered	species of concern	covered

Species of Concern	Common Name	BLM Status	NDF State Status	FWS Status	MSHCP Status
<i>Arctomecon merriamii</i>	white bearpoppy	special status	none	species of concern	covered
<i>Astragalus geyeri</i> var. <i>triquetrus</i>	threecorner milkvetch	special status-state sensitive	critically endangered	species of concern	covered
<i>Astragalus nyensis</i>	Nye milkvetch	special status	none	species of concern	none
<i>Calochortus striatus</i>	alkali mariposa lily	special status	none	species of concern	covered
<i>Cryptantha insolita</i>	Las Vegas catseye	special status-state sensitive	critically endangered/extinct	species of concern	evaluation-medium
<i>Eriogonum corymbosum</i> var. <i>glutinsum</i>	Las Vegas buckwheat	special status-state sensitive	*nominated as critically endangered	species of concern	none
<i>Opuntia whipplei</i> var. <i>multigeniculata</i>	blue diamond cholla	special status-state sensitive	critically endangered	species of concern	covered
<i>Pediomelum castoreum</i>	beaver dam breadroot	special status	none	species of concern	watch list
<i>Penstemon bicolor</i> ssp. <i>roseus</i>	rosy two-tone penstemon, rosy two-tone beardtongue	special status-state sensitive	critically endangered	species of concern	watch list
<i>Penstemon bicolor</i> ssp. <i>bicolor</i>	yellow two-tone penstemon, yellow two-tone beardtongue	special status	none	candidate species	watch list
<i>Perityle intricata</i>	delicate rock daisy	special status	none	species of concern	none
<i>Phacelia parishii</i>	parish phacelia	special status	none	species of concern	covered

Sticky Ringstem (*Anulocaulis leioselinus*)

Sticky ringstem does not have BLM or NDF status nor does it have FWS status, but it is a MSHCP covered species. Sticky ringstem is a robust perennial herb to 1.5 meters tall, forming large clumps. Flowers are greenish-bronze on the tube and white or pale pink on the limb. In Nevada, this species has been found along the eastern edge of the Mojave Desert in Clark County. It is not known whether the Las Vegas population of sticky ringstem is taxonomically distinct from the widespread population that extends to Arizona and New Mexico (Knight and Leavitt, 2003). This species tends to occur on gypsiferous soils on rolling hills and terraces and is commonly associated with Las Vegas bearpoppy and other gypsophile plants. Areas of gypsum-impregnated soils encompass approximately 122 acres within the half-mile-wide plan area.

A total of 86 specimens of sticky ringstem were located during the summer and fall 2002 surveys for this project on the alignment from milepost 16.4 to 19.8. Sites were within the BLM Sunrise Management Area/Rainbow Gardens. Refer to Map 2: Biological Resources in Appendix A for locations of sticky ringstem and areas of gypsum soils, which may be potential habitat for this species. These areas are located throughout much of the plan area south of milepost 14.

Las Vegas Bearpoppy (*Arctomecon californica*)

Las Vegas bearpoppy is critically endangered according to BLM and NDF and a FWS species of concern. Las Vegas bearpoppy is a short-lived perennial wholly endemic to the Mojave Desert (mostly Clark County), where it grows on gypsiferous outcrops (BLM, 1998, 2000; Knight and Leavitt, 2003). Las Vegas bearpoppy grows with a suite of gypsum endemics including Las Vegas buckwheat, sticky ringstem and Palmer phacelia (*Phacelia palmeri*). At this time, none of the gypsum endemics are known to transplant successfully (100 percent mortality) or to germinate from seed.

Las Vegas bearpoppy specimens were located during summer and fall 2002 surveys in many of the same areas that sticky ringstem (above) was found, along the alignment from milepost 15.8 to 19.8. Gypsum soils, which indicates potentially suitable habitat for this species, are indicated on Map 2: Biological Resources in Appendix A

White Bearpoppy (*Arctomecon merriamii*)

White bearpoppy is identified as sensitive by the BLM and NDF and is a FWS species of concern. White bearpoppy is a perennial with short stems atop a stout taproot. This species flowers from April to early June. Its habitat includes salt desert scrub and Mojave Desert scrub. Populations are scattered over various habitats including limestone and dolomite ridges, rocky slopes, gravely canyon washes and less often on valley bottoms, disturbed sites such as roadsides and bladed areas and old lakebeds derived from carbonate rock sources. White bearpoppy is endemic to the Mojave Desert and is found in the western half of Clark County, distributed throughout a 9,650 square mile area, west of the plan area, between 2,000 and 6,200 feet (NNHP, 2001).

This species was not surveyed for during the 2002 survey. Based on data from the Nevada Natural Heritage Program, it is not likely to occur in the plan area.

Threecorner Milkvetch (*Astragalus geyeri* var. *triquetrus*)

Threecorner milkvetch is identified as critically endangered by the BLM and NDF. The FWS identified it as a species of concern. Threecorner milkvetch is an annual herb that is endemic to the eastern Mohave Desert. It grows in loose, sandy soils or stabilized sands, occasionally with a pebble cover. This species tends to appear in creosote bush scrub during springs with average or higher precipitation (Knight and Leavitt, 2003). It occurs from the northeastern portion of Clark County, in Sand Hollow Wash, Lincoln County and in Mohave County, Arizona (Niles et al., 1995). Previous surveys for the Harry Allen–Crystal 500kV Transmission Line EA identified specimens just north of the plan area in sandy soils midway between Harry Allen and Crystal substations (BLM, 2001). Additional habitat was identified between mileposts 19 and 21 of the plan area.

Threecorner milkvetch was not seen in the plan area during the 2002 survey. There was, however, lower than normal rainfall for the plan area during the survey year. As a result, this species could potentially be found during wetter years in the area between mileposts 19 and 21.

Nye Milkvetch (*Astragalus nyensis*)

Nye milkvetch is a slender, pubescent, annual herb originally collected in Nye County, Nevada but now thought to have a larger range (Knight and Leavitt, 2003). Its habitat is typical of outwash fans, gravelly flats and occasionally sandy soils. This species is known to occur with threecorner milkvetch, which has been identified from previous surveys in areas just north of the plan area. Habitat for threecorner milkvetch was also identified between mileposts 19 and 21 of the plan area.

Nye milkvetch was not seen in the plan area during the 2002 survey. However, like threecorner milkvetch, a lower than normal rainfall for the plan area could have impacted survey results.

Alkali Mariposa Lily (*Calochortus striatus*)

Alkali mariposa lily is sensitive according to the BLM and NDF and a species of concern for FWS. This perennial species flowers from April to June. The flowers have light purple petals striated with darker purple veins, with the lower half sparsely white and hairy. It is found growing in Mojave Desert scrub, restricted to alkaline meadows and mesic areas between 2,100 and 3,700 ft. in elevation (Recon, 2000). It is endemic to the western Mojave Desert in California and Nevada. In Clark County, this lily can be found in the Red Rock Canyon NCA, west of the plan area (Recon, 2000).

The alkali mariposa lily species was not surveyed for during the 2002 survey. No alkaline meadows occur within the plan area; therefore, it is unlikely to occur.

Las Vegas Catseye (*Cryptantha insolita*)

Las Vegas catseye, also known as unusual catseye, is identified as critically endangered by the BLM and NDF and a species of concern by FWS. This perennial herb blooms April-June. It normally occurs in light-colored, alkaline clay flats and rolling hillsides with creosote bush scrub at about 1,000 to 2,000 feet in elevation. It is known from only two collections made in 1905 and 1942. Both collections were made in the bajadas north of Las Vegas, Nevada.

This species has been searched for without success and it may now be extinct (NatureServe, 2002); therefore, the Las Vegas catseye was not surveyed for during the 2002 survey and is not likely to occur in the plan area.

Las Vegas Buckwheat (*Eriogonum corymbosum* var. *glutinosum*)

Las Vegas buckwheat, also known as golden buckwheat, has been nominated for critically endangered by the BLM and NDF (Nelson, BLM, personal communication, July 2003). It is also a FWS species of concern. Las Vegas buckwheat is a large, yellow-flowered shrub that flowers in the fall, typically in October. This species was previously assigned to the St. George, Utah, populations, where it was considered endemic (Reveal, 1995). Current studies show that the Las Vegas buckwheat is unique genetically and occurs in the North Las Vegas area, the White Basin area of the Muddy Mountains and the Gold Butte area (Nelson, BLM, Las Vegas Field Office, personal communication, August 2003). This same unique species might also occur in the extreme southern end of

Utah. In Clark County, Las Vegas buckwheat occurs on gypsiferous soils, or other unusual evaporite soils, frequently with Las Vegas bearpoppy.

This species was not surveyed for in 2002, but potential habitat of gypsum soils occurs throughout the plan area south of milepost 14 (refer to Map 2: Biological Resources in Appendix A).

Blue Diamond Cholla (*Opuntia whipplei* var. *multigeniculata*)

Blue diamond cholla is critically endangered according to BLM and NDF and a FWS species of concern. This species is thought to be endemic to the Blue Diamond Hills west of Las Vegas and was originally known from only one population there. Habitat for this species includes Mojave Desert scrub. Populations are restricted to dry limestone hills, underlain by gypsum, occurring mostly on north-facing slopes and exposed ridges. This cholla species forms part of a distinctive, unusual and rare plant community of succulent scrub. This community is characterized and dominated by a wide diversity of cactus, yucca and agave species.

This species was not identified during the 2002 surveys. Habitat in washes and loose rock slopes typically had little or no cacti and yucca species (Knight and Leavitt, 2003). Other species that were identified included silver cholla, buckthorn cholla and pencil cholla. Potential habitat may exist in the plan area, however this species is not likely to occur there given its limited known occurrences far to the west of the plan area.

Beaver Dam Breadroot (*Pediomelum castoreum*)

Beaver Dam breadroot has no BLM or NDF status, but it is a FWS species of concern. Beaver Dam breadroot is a low growing perennial herb that blooms from early April to mid-May and sets fruit by June. It grows in open sandy soils or sandy-clay soils in creosote bush scrub. Beaver Dam breadroot occurs from San Bernardino County, California through Clark County, Nevada to a narrow portion of Mohave County, Arizona. Beaver Dam breadroot is endemic to the Mojave Desert (Knight and Leavitt, 2003). This species has potential to occur with threecorner milkvetch.

This species was not surveyed for in 2002, but habitat was identified for threecorner milkvetch between mileposts 19 and 21, which could potentially provide habitat for this species.

Rosy Two-tone Penstemon (*Opuntia whipplei* var. *multigeniculata*)

Rosy two-tone penstemon is a proposed state sensitive species by BLM and NDF. The FWS status is species of concern. Rosy two-tone penstemon is a short-lived perennial that is wholly endemic to the Mojave Desert and widely occurs in Clark and Nye counties, Nevada and across the border into Arizona. This species flowers in April and prefers active wash channels comprised of calcareous gravels.

Rosy two-tone penstemon was not seen during the 2002 surveys, but it was suspected to occur given the 94 drainages identified as potential habitat within the plan area (Knight and Leavitt, 2003). Previous records indicated that the plants had been found within the plan area between milepost 0 and 6.0. Additional past sightings occurred between milepost 22 and 23 and between milepost 38 and 39.

Yellow Two-tone Penstemon (*Penstemon bicolor* ssp. *Bicolor*)

Yellow two-tone penstemon is identified as state sensitive by BLM and a FWS species of concern. Yellow two-tone penstemon is a perennial that is a probable endemic to Nevada and occurs in Clark County. This species is in decline with urban expansion of Las Vegas identified as a major threat. Flowers occur in April-May and like the rosy two-tone penstemon, this species prefers active wash channels comprised of calcareous gravels.

Yellow two-tone penstemon was not seen in 2002, but this species could occur in any of the 94 drainages identified as potential habitat for rosy two-tone penstemon.

Delicate Rock Daisy (*Perityle intricata*)

Delicate Rock Daisy has no BLM or NDF status but is a FWS species of concern. This species occurs at elevations of 2,620 to 6,000 feet in crevices and rubble of carbonate outcrops in the shadescale, blackbrush and mixed shrub zones (NNHP, 2001). It flowers in late spring to early fall.

The delicate rock daisy was not surveyed for during the 2002 survey. No individual plants or habitat is known to occur within the plan area.

Parish Phacelia (*Phacelia parishii*)

Parish phacelia is identified by BLM and NDF as state sensitive and by FWS as a species of concern. Parish phacelia occurs in salt desert scrub on alkaline playas and valley floors on lakebeds characterized by wet, heavy clay soils with excessive concentrations of soluble salts. It is generally found between 2,500 and 5,600 feet elevation. This species has been located at two locations in Clark County: Indian Springs Valley and Three Lakes Valley, both of these areas are located west of the plan area. A historic population in the Las Vegas Valley is apparently extirpated (NNHP, 2001).

This species was not surveyed for during the 2002 survey. No individual plants or habitat is known to occur within the plan area.

Cacti and Yucca

In Nevada, cacti and yucca (families Cactaceae and Agavaceae) and evergreen trees are protected by Nevada Revised Statutes (NRS 527.060-.120). There is potential for cacti and yuccas to occur along the proposed alignment. Density and species vary tremendously along the corridor. Below the 2,300-foot contour, cacti and yuccas numbers tend to decrease rapidly. In some areas, cacti and yuccas are an insignificant part of the flora. Low cacti density is often due to the pressures of urban expansion, i.e. easy access to illegally remove this resource. Salvage of cacti and yucca is required by BLM.

During the 2002 field surveys, the following cacti and yucca species were identified in order of highest to lowest abundance: *Opuntia basilaris*, *Neolloydia johnsonii*, *Opuntia exhinocarpa*, *Opuntia acanthocarpa*, *Ferocactus acanthodes*, *Opuntia ramosissima*, *Yucca schidigera*, *Echinocereus engelmannii* and *Echinocactus polycephalus*.

3.3.2 Noxious Weeds

Introduction

Preventing the introduction and spread of noxious weeds is one objective of Integrated Weed Management Programs on BLM-administered lands throughout the United States, as directed under Executive Order 13112 – Invasive Species. The term “invasive species” is defined as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. The term “noxious weed” is defined as plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official.

Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and new to or not common to the United States or parts thereof.

The Proposed Action may include clearing of land capable of supporting vegetation native to the plan area. The process of clearing these lands and the subsequent loss of native vegetation, although minimal, can make the area vulnerable to noxious weed invasions.

Noxious Weeds Inventory Methods

Information on noxious weeds that may occur in the vicinity of the plan area was obtained from the Clark County web site (http://www.co.clark.nv.us/comprehensive_planning/current/Title30/Appendices/Title30_Appendix_C_Weeds.htm), the Nevada Weed Action Committee web site (http://www.agri.state.nv.us/nwac/NV_NoxWeeds.htm), Nevada’s Coordinated Invasive Weed Strategy 2000 report (<http://agri.state.nv.us/weed.pdf>) and from Clark County Vector Control.

Noxious Weeds Inventory Results

Nevada’s Coordinated Invasive Weed Strategy 2000 report listed those species having the “potential to cause the greatest impact on Nevada’s ecosystem and economic well being.” Most of these species are also included in the Nevada state list of noxious weeds.

Cheat grass (*Bromus tectorum*) and red brome (*Bromus rubens*) are common noxious weeds throughout the plan area and most parts of Southern Nevada. These species thrive where land has been stripped of its vegetation during land-disturbing activities.

Within riparian areas, tall whitetop (*Lepidium latifolium*), also known as perennial pepperweed, is a concern in Nevada (Good, Nevada Cooperative Extension Service, personal communication, June 2003 and Hicks, Clark County Vector Control, personal communication, June 2003). This species occurs in the Las Vegas Wash within the plan area. Clark County Vector Control also finds and applies controls on saltcedar (*Tamarix* spp.) within the Las Vegas Wash.

Sahara mustard (*Brassica tournefortii*) is becoming a troublesome invasive in the southern Nevada area (Nelson, BLM, Las Vegas Field Office, personal communication, August 2003). Sahara mustard is a prolific seed producer invading roadsides and sandy

areas. These sandy areas are of concern because they tend to be habitat for many sensitive plant species. Since parts of the project area are within sandy areas that contain these sensitive species, BLM is very concerned about the spread of this invasive to those areas by this action.

3.3.3 Wildlife Resources

Introduction

The FWS maintains the list of species protected by the Endangered Species Act. This list classifies species that are endangered, threatened, proposed threatened and candidate by the FWS. Animals considered state sensitive are protected by the Nevada Division of Wildlife (NDOW) and are also considered sensitive by BLM. A letter was received from FWS on March 12, 2003 (File No. 1-5-03-SP-478) identifying federally listed species and Nevada species of concern that may be present within the proposed project area. The list of threatened, endangered and candidate species within the project area had not changed as of September 18, 2003 (LaVoie, September 2003, Personal Communication).

Wildlife Inventory Methods

Vegetation community mapping from the Clark County GIS, 2001 aerial imaging from the spatial information firm, HJW, Inc. and 40-foot topographic contour data were used as the basis for the wildlife habitat-based assessment of the transmission line plan area. Additionally, resource agency databases from the Nevada Natural Heritage Program (NNHP), the BLM and the Southern Nevada Field Office of the FWS were used. GIS data layers were mapped within the plan area and plotted on 1:12,000 scale maps for field-verification of the vegetation communities within the one-half-mile-wide study corridor for biological resources (See Appendix A, Map 2: Biological Resources).

Scientific literature, technical reports and resource agency databases were reviewed to assemble information regarding the biological resources of the plan area. Current data on the occurrence of sensitive species in the plan area were obtained from the NNHP, the Nevada Division of Wildlife (NDOW), Clark County MSHCP (FWS, 2000), the BLM and the Southern Nevada Field Office of the FWS.

Wildlife Inventory Results

U.S. Fish and Wildlife Service Threatened and Endangered Species

The FWS identified several threatened, endangered and candidate wildlife species potentially located within the plan area. Table 3-2 lists these species and identifies the corresponding protection status for the BLM, state of Nevada (NDOW) and MSHCP.

Table 3-2 Federally Listed and Candidate Wildlife Species That May Occur Within the Plan Area

Scientific Name	Common Name	Habitat	FWS Status	State/BLM Status	MSHCP Status
<i>Gopherus agassizii</i>	desert tortoise	Mojave desert scrub	threatened	threatened	covered
<i>Empidonax traillii extimus</i>	southwestern willow flycatcher	lowland riparian	endangered	protected	covered

Scientific Name	Common Name	Habitat	FWS Status	State/BLM Status	MSHCP Status
<i>Haliaeetus leucocephalus</i>	bald Eagle	mixed conifer, pinyon-juniper, sagebrush, lowland riparian and grassland habitats, usually close to large bodies of water, such as Lake Mead	threatened	protected	watch list
<i>Rallus longirostris yumanensis</i>	Yuma clapper rail	freshwater and brackish marshes, prefer dense cattails, bulrushes and other aquatic vegetation	endangered	protected	watch list
<i>Coccyzus americanus</i>	western yellow-billed cuckoo	riparian	candidate	protected	covered
<i>Rana onca</i>	relict leopard frog	desert riparian, springs	candidate	protected	covered

Desert Tortoise

The Mojave population of the desert tortoise is protected by the state of Nevada and was emergency listed by petition as endangered on October 13, 1989 and subsequently listed by the FWS as a threatened species on April 02, 1990 (55 FR 12178). Critical habitat was designated on February 08, 1994 (59 FR 5820). A recovery plan was completed and made available on June 28, 1994. A portion of the desert tortoise range within the project study area is covered under the programmatic biological opinions developed for tortoises inside (File No. 1-5-96-F-23R.AMD2) and outside (File No. 1-5-97-F-251) the Las Vegas Valley; however the project would disturb greater than the maximum acres allowed (240) for coverage under these biological opinions. A separate biological opinion will be rendered for this project, which will include all Federally-managed lands crossed by the project (BLM, USBR and Western).

The desert tortoise occurs on arid lands in association with low desert creosote bush scrub communities generally below 4,500 ft. Its preferred habitat includes scattered shrubs and a sufficient herbaceous understory layer to provide food and water needs. Tortoises can survive for a year without water (SNEI, 2003). When it rains, tortoises may form small depressions in the desert pavement to gather water. The desert tortoise occurs most often on flats and bajadas characterized by sandy to sandy-gravelly soils, but also on slopes and in rocky soils.

Tortoises are semi-fossorial, spending more than 90 percent of their life underground in burrows or pallets (SNEI, 2003). Burrows are between 2.5 and 10 feet in length and serve as a place to escape from the heat of the summer and a place of hibernation in the winter. This species is most active in the spring, primarily in late March until the beginning of the summer in June.

Dangers to the desert tortoise include Upper Respiratory Tract Disease (URTD), habitat loss, loss of forage plants to invading species, drought and vehicles, especially off-road vehicles (SNEI, 2003). A major threat to juvenile tortoises is predation by common ravens. Raven populations have increased considerably in recent years, probably caused by the rise in human population densities providing sources of food and water in otherwise barren areas (The Desert Tortoise Council, 2001).

The desert tortoise is expected to occur throughout the plan area with the exception of the highly urbanized areas. The density of tortoises in the plan area varies depending on location. Appendix A, Map 2: Biological Resources includes BLM data on tortoise densities in the plan area. Desert tortoise sign was observed throughout the project study area. Numerous tortoises with a range of age and size were observed, as well as other signs of tortoise including burrows, scat, carcasses and pallets.

Southwestern Willow Flycatcher

The southwestern willow flycatcher is state protected and was proposed for listing under the ESA on July 23, 1993 (58 FR 39495) and subsequently listed by the FWS as an endangered species on February 27, 1995 (60 FR 10693). There is no designated critical habitat in the proposed project area. A draft recovery plan for this species is currently under review.

The currently known breeding population for southwestern willow flycatcher is estimated to be between 300 and 500 pairs at about 75 sites throughout the southwest (Sogge, *et al*, 1997). This species lives in riparian habitat along rivers, streams, or other wetlands in dense growths of willows (*Salix* sp.), *Baccharis*, arrowweed (*Pluchea* sp.), buttonbush (*Cephalanthus* sp.), tamarisk (*Tamarix* sp.) and Russian olive (*Eleagnus* sp.), often with a scattered overstory of cottonwood (*Populus* sp.) (FWS, 2001). Throughout their range, these habitats tend to be rare and widely separated. Modification and loss of this habitat has endangered this species (Arizona Game and Fish, 2001). Brood parasitism by the brown-headed cowbird has also contributed to their decline (FWS, 2000). The southwestern willow flycatcher is an insectivore, foraging within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage.

This species arrives in North America between early May and early June to breed, then departs during late summer to spend the winter in Mexico, Central America and possibly northern South America (Sogge, *et al*, 1997). Degradation of wintering habitat may also be a factor in its decline. Migrating southwestern willow flycatchers may use non-riparian habitats. These migration stopover areas are not used for breeding; however, they may be critically important to local and regional flycatcher productivity and survival.

There is habitat appropriate for use by this species near the project area in the vicinity of the Las Vegas Wash. However, the constructed wetlands found in the Las Vegas Wash area have not been successful in attracting this species (Titus 2002). No southwestern willow flycatchers were found during Southern Nevada Environmental, Inc. (SNEI) surveys of the entire route in 2001 and 2002 nor was this species found during the 2003 survey of the Las Vegas Wash. However, in 2002, FWS protocol surveys conducted for an unrelated SNWA project detected two migrant flycatchers in the Las Vegas Wash survey area.

Bald Eagle

The bald eagle is currently listed by the FWS as a threatened species. Populations have recovered significantly in recent years and subsequently the FWS proposed removing the bald eagle from the Endangered Species List (64 FR 128).

Bald eagles nest in large trees or on cliffs adjacent to water. Their diet includes fish, waterfowl, small mammals and carrion. A pair of bald eagles nested the last two out of

three years at the Lahontan Reservoir near Fallon in northern Nevada. This is the first record of bald eagles nesting in Nevada in 100 years (Las Vegas Review Journal, 2002). There are no known bald eagle nests in southern Nevada (Tomlinson, personal communication, 2001).

During the winter, eagles often roost communally near large bodies of water. Bald eagles are known to winter at reservoirs in Nevada. A biologist with the Lake Mead National Recreation Area (NRA) indicated that between 40 and 60 bald eagles spend the winter at the Lake Mead between November and April and their numbers have been increasing substantially in recent years (Mike Boyle, Lake Mead National Recreation Area, personal communication, July 30, 2001). However, the plan area does not provide any suitable bald eagle wintering or foraging habitat. Bald eagles would likely pass through the plan area during the spring and fall on their way to the NRA and other suitable habitats.

This species was not specifically surveyed for; however, no bald eagles were noted during the SNEI surveys of the entire route in 2002 or during the 2003 SNEI survey of the Las Vegas Wash.

Yuma Clapper Rail

The Yuma clapper rail is listed by the FWS as an endangered species and is protected by the State of Nevada. This long-legged marsh bird lives in fresh and brackish water along rivers in the Colorado River valley and some adjacent areas of California, Arizona and Mexico. The total population is about 1,700-2,000 individuals. They require freshwater marshes containing mature dense stands of cattails and bulrushes, although they may also inhabit tamarisk marsh thickets (Moore, Sealove and Knight, 1993). Nesting occurs on dry hummocks or in small shrubs. Food items include small fish, insects, frogs and crayfish.

The Nevada Natural Heritage Database (NNHP, 2002) has recorded one instance of Yuma clapper rail several miles away from the plan area within the Las Vegas Wash however no nesting has been confirmed. There is marsh habitat appropriate for use by this species near the plan area, in the vicinity of the Las Vegas Wash. However, like the southwestern willow flycatcher, constructed wetlands have not been successful in attracting this species (Titus 2002).

Southern Nevada Water Authority (SNWA) completed FWS protocol surveys for Yuma clapper rail from 2000 to 2003 within the project area of the Las Vegas Wash for an unrelated project. In 2002, project specific protocol surveys were conducted within the project area by FWS-permitted individuals at SNEI. No Yuma clapper rails were detected during any of these surveys.

U.S. Fish and Wildlife Service Candidate Species

Western Yellow-billed Cuckoo

The western yellow-billed cuckoo is the only FWS candidate species with potential to occur in the plan area. This state protected species was designated by the FWS as a Candidate species on July 25, 2001 (66 FR 38611).

SNEI surveys of the entire project area during 2001 and 2002 and surveys of the Las Vegas Wash in 2003 found no occurrence of western yellow-billed cuckoo. Nor was this species detected during FWS protocol surveys conducted from 2000 to 2003 in the Las Vegas Wash area for an unrelated SNWA project (McArthur, July 2003, personal communication).

Relict Leopard Frog

The relict leopard frog is a FWS candidate species and is protected by the state of Nevada. This species was thought to be extinct by the early 1950s, however surveys in 1991 resulted in the discovery of eight populations at historic locations. Of the eight populations found in 1991, two have since gone extinct, including the Arizona population. Reasons for the decline of the relict leopard frog in Nevada probably include water use and the creation of Lake Mead, which eliminated most of the frogs existing habitat. All eight known locations of relict leopard frog are along the north shore of Lake Mead and near Lake Mojave. One population was located along the Virgin River in Arizona. There are no known populations or any known historic locations near the plan area. This species was not surveyed during field investigations.

FWS Species of Concern

“Species of concern” is an informal term that refers to those species that the FWS believes might be in need of concentrated conservation actions. The FWS identified several species of concern that could be located within the plan area. The BLM, NDOW and MSHCP also list species that are sensitive or protected in Nevada.

Reptiles and Amphibians

Table 3-3 lists reptiles and amphibians that are species of concern and state protected.

Table 3-3 Amphibian and Reptile Species of Concern That May Occur Within the Plan Area

Scientific Name	Common Name	Habitat	FWS Status	State/BLM Status	MSHCP Status
<i>Sauromalus obesus</i>	chuckwalla	rocky hillsides and talus slopes, boulder piles, lava bed, or other clusters of rock, usually in association Mojave Desert scrub, which includes black brush, salt scrub and mesquite/catclaw	species of concern	sensitive	covered
<i>Heloderma suspectum cinctum</i>	banded Gila monster	Mojave Desert scrub, mesquite/catclaw, blackbrush, pinyon-juniper and desert riparian	species of concern	protected	evaluation-high
<i>Bufo californicus microscaphus</i>	arroyo southwestern toad	riparian washes, rocky streams, basins, agricultural and urban areas up to 6,000 feet	species of concern	none	evaluation-high

Chuckwalla

The chuckwalla, a FWS species of concern and state sensitive, is a reptile found throughout the deserts of the southwestern United States and northern Mexico. Chuckwallas inhabit rocky outcrops where cover is available between boulders or in rock crevices typically on slopes and open flats below 6,000 feet.

The chuckwalla is a widespread species in the southwest desert but is regionally limited because of its need for rock outcrops. It is widely distributed in Clark County, although it suffered population losses from filling of Lake Mead and development of the Las Vegas Valley (FWS, 2000). Chuckwallas are found in the rocky terrain of the hills and mountain ranges that surround the Valley (BLM, 1998). Habitat for this species also likely occurs in the McCullough pass area and anywhere the project goes through areas with rocky outcrops.

Banded Gila Monster

The banded Gila monster, a state protected reptile species and a FWS species of concern, is one of two species of venomous lizards found in North America. In the Sonoran Desert Gila monsters are typically found in wetter, rockier desert scrub. Little is known about habitat use within the Mojave Desert, but when detected, Gila monsters are often found near washes or intermitten streams where they have access to water or damp soil (Stebbins, 1985).

The range of the Gila monster includes the Mojave, Sonoran and Chihuahuan deserts of extreme southwestern Utah, southern Nevada, southeastern California, western Arizona and southwestern New Mexico into Mexico. Habitat destruction and illegal collection are the main threats to this species (FWS, 2000). Large portions of the plan area, outside the urban areas, are considered Gila monster habitat.

Arroyo Southwestern Toad

The arroyo southwestern toad, a subspecies of the arroyo toad, is the only amphibian FWS species of concern in the project area. This species inhabits streams and arroyos bordered by willow and cottonwoods, washes and adjacent uplands. It also can be found along irrigation ditches, reservoirs and in flooded fields up to 6,000 feet. The range of this species is highly fragmented. There are no arroyo southwestern toads in the plan area (Hobbs, personal communication, 2001).

Riparian Birds

Table 3-4 lists all bird species of concern or sensitive species for the FWS, NDOW and/or MSHCP. Almost all of the region's bird species depend on wetland and riparian habitats during at least some phase of their annual cycle (Dobkin 1998). For those species identified in Table 3-4 as requiring riparian habitat, their presence in the plan area would be limited to the Las Vegas Wash area. However, as discussed above in Section 3.3.1, Botanical Resources, the Las Vegas Wash provides fairly low quality riparian habitat. The location of the riparian vegetation within the Las Vegas Wash can be seen on Map 2: Biological Resources in Appendix A. None of these riparian species are known to nest in the Las Vegas Wash area; however, they could pass through this area during migration.

Table 3-4 Bird Species of Concern That May Occur Within the Plan Area

Scientific Name	Common Name	Habitat	FWS Status	State/ BLM Status	MSHCP Status
<i>Chlidonias niger</i>	black tern	riparian	species of concern	sensitive	none
<i>Empidonax wrightii</i>	gray flycatcher	riparian	species of concern	protected	none
<i>Guiraca caerulea</i>	blue grosbeak	riparian	species of concern	protected	covered
<i>Ixobrychus exilis hesperis</i>	western least bittern	riparian	species of concern	protected	watch list
<i>Phainopepla nitens</i>	phainopepla	riparian, mesquite, catclaw-acacia	species of concern	sensitive	covered
<i>Piranga rubra</i>	summer tanager	riparian	species of concern	protected	covered
<i>Plegadis chihi</i>	white-faced ibis	riparian	species of concern	sensitive	watch list
<i>Pyrocephalus rubinus</i>	vermillion flycatcher	riparian	species of concern	protected	covered
<i>Vermivora luciae</i>	Lucy's warbler	riparian, desert wash, mesquite	species of concern	protected	none
<i>Vireo bellii arizonae</i>	Arizona Bell's vireo	riparian	species of concern	protected	covered
<i>Athene cunicularia hypugea</i>	western burrowing owl	agriculture, desert scrub, sagebrush, grassland	species of concern	proposed sensitive	evaluation-high
<i>Falco peregrinus anatum</i>	American peregrine falcon	wetlands, agriculture, sagebrush, grassland, urban	species of concern	sensitive	covered
<i>Buteo regalis</i>	ferruginous hawk	agriculture, desert scrub, sagebrush, grassland	none	proposed sensitive	watch list

Most of the birds nesting in the plan area are protected under the Migratory Bird Treaty Act (MBTA). The MBTA of 1918 and subsequent amendments (16 U.S.C. 703-711) state that it is unlawful to take, kill or possess migratory birds. Few bird species found in the United States are not protected by the MBTA. Migratory birds potentially nesting in the plan area also include cactus wren, sage sparrow, black-throated sparrow, killdeer and western meadowlark.

Raptors

Western Burrowing Owl

Western burrowing owls are year-round residents, breeding throughout southern Nevada in the summer and wintering just south of the plan area (Rappole, 2000). This species lives in open lands in association with burrowing animals such as prairie dogs, kit fox and desert tortoise. Nesting occurs in burrows, where the young stay until ready to fledge. Preferred habitats in Clark County include grassland, Mojave desert scrub and sagebrush/perennial grassland. Their diet includes large insects, reptiles, amphibians and small rodents (FWS, 2000). Threats to this species include loss of habitat, poisoning of prey species and highway mortality (FWS, 2000). Most of the plan area, outside of the urban areas, is potential burrowing owl habitat.

Peregrine Falcon

The peregrine falcon was removed from the endangered species list in August 1999. This species lives in open areas near water and are year-round residents of the Colorado River Valley (Rappole, 2000). Peregrine falcons nest on cliffs, preying mainly on birds (National Geographic, 1987). They are known to breed on buildings in the Las Vegas Valley and at Lake Mead (FWS, 2000). A pair of peregrine falcons has been nesting at the River Mountains and there is a new territory at Sunrise Mountain (Tomlinson, personal communication, 2001). Peregrine falcons are probably using parts of the plan area for foraging year round.

Ferruginous Hawk

The ferruginous hawk inhabits dry, open country and perches in trees, poles and on the ground (National Geographic, 1987). This species has no Federal status but is state protected and on the MSHCP watch list. The entire plan area is potential wintering habitat for the ferruginous hawk, but it occurs infrequently (FWS, 1992; Tomlinson, personal communication, 2001).

Mammals

Table 3-5 lists all mammal species of concern with potential to occur in the plan area. Mule deer and desert bighorn sheep are the only large mammals potentially occurring in the plan area. Both are state protected species but are hunted in Nevada as big game.

Mule Deer

Mule Deer typically move between various zones from higher elevations to the desert floor, depending on the season and food supplies. Generally, they summer at higher elevations and winter at lower elevations. Mule deer occupy a range of habitat, yet they seem to prefer arid, open areas and rocky hillsides (NDOW, 2003). Areas with bitterbrush and sagebrush provide common habitat. Mature bucks tend to prefer rocky ridges for bedding grounds, while does and fawns are more likely to bed down in the open. Breeding season or rut typically occurs from November to December with a seven-month gestation period.

Mule deer may be found occasionally within the plan area but habitat is limited. The McCullough Mountains in the southern portion of the plan area provide some habitat needs, but do not support a large population due to limited water availability (Shepard, NDOW, personal communication, September 2003).

Desert Bighorn Sheep

Desert bighorn sheep prefer rough, rocky and steep terrain, broken up by canyons and washes. Because bighorn sheep habitat in Nevada has hot summers and little annual precipitation, water during summer months can be a limiting factor and in drought conditions can drastically impact lambing and survival (NDOW, 2003). Although rams may go three days without water, ewes and lambs come to water holes almost daily during the hot, dry summer months. The breeding season or rut generally extends from July through September with a six-month gestation period.

Table 3-5 Sensitive Mammal Species That May Occur Within the Plan Area

Scientific Name	Common Name	Habitat	FWS Status	State/BLM Status	MSHCP Status
<i>Ovis canadensis</i>	desert bighorn sheep	rocky hillsides and mountains	none	protected	watch list
<i>Odocoileus hemionus</i>	mule deer	mixed habitats, forest edges, mountains and foothills	none	protected	none
<i>Corynorhinus townsendii pallescens</i>	pale Townsend's big-eared bat	low desert to high mountain, highly associated with caves and mines	species of concern	protected	evaluation-high
<i>Euderma maculatum</i>	spotted bat	wide range of habitats, linked to availability of cliff roosting	species of concern	threatened	watch list
<i>Eumops perotis californicus</i>	greater western mastiff bat	wide range of habitats, roosts in cliffs and boulder cracks	species of concern	protected	watch list
<i>Idionycteris phyllotis</i>	Allen's big-eared bat	pine-oak forested canyons and coniferous forests, may occur in non-forested, arid habitats, near cliffs, outcroppings, boulder piles or lava flows	species of concern	protected	watch list
<i>Macrotus californicus</i>	California leaf-nosed bat	low elevation desert scrub, common in caves in lower desert areas	species of concern	protected	watch list
<i>Myotis ciliolabrum</i>	small-footed myotis	desert scrub, grasslands, sagebrush steppe and pinyon-juniper woodlands and pine forests	species of concern	protected	evaluation-medium
<i>Myotis evotis</i>	long-eared myotis	higher elevation, ponderosa pine	species of concern	protected	covered
<i>Myotis thysanodes</i>	fringed myotis	wide range of habitats from upper elevation creosote bush desert to 7,000 feet in the white pine mountains	species of concern	protected	evaluation-medium
<i>Myotis velifer</i>	cave myotis	lower elevations in arid habitat dominated by creosote bush, palo-verde, brittlebush, cactus and desert riparian	species of concern	protected	watch list
<i>Myotis volans</i>	long-legged myotis	mid-high elevations, pinyon-juniper, joshua tree woodland and montane coniferous forests	species of concern	protected	covered
<i>Myotis yumanensis</i>	Yuma myotis	low to middle elevations in a wide variety of habitats including urban areas	species of concern	protected	watch list
<i>Nyctinomops macrotis</i>	big free-tailed bat	mainly canyonlands, found in arroyo, scrub desert, woodlands and riparian areas	species of concern	protected	watch list

The proposed route would cross bighorn sheep habitat in the southern portion of the plan area. Potential bighorn sheep habitat is shown on Map 2: Biological Resources in Appendix A. The NDOW does annual aerial surveys for bighorn sheep. According to NDOW survey data, bighorn sheep are now mainly in the southern portion of the plan area (mileposts 36 to 42) due to development and lack of water in more northern areas (Shepard, NDOW, personal communication, September 2003). The latest population estimate for this area is approximately 200 adults.

The NDOW has also overseen the installation of “water guzzlers”, systems built into the environment to direct rainwater into collection tanks to make up for water sources lost to development in the Las Vegas area. Several of these guzzlers are located just outside the plan area in the McCullough Mountains. Minimizing development that may impede the movement of sheep from their feeding and lambing areas to these water sources is a key concern for NDOW.

Bats

Twelve species of protected bats occur in the plan area: Pale Townsend’s big-eared bat; spotted bat; greater western mastiff bat; Allen’s big-eared bat; California leaf-nosed bat; small-footed myotis; long-eared myotis; fringed myotis; cave myotis; long-legged myotis; Yuma myotis; and big free-tailed bat.

Since there are very few trees, caves or mines in the plan area, bats’ use of the area is limited to occasional foraging. According to the Nevada Bat Conservation Plan, most foraging takes place adjacent to water (Altenbach et al., 2002). Water is scarce in the plan area, therefore, it is expected that bat use of the plan area would be limited to areas surrounding the Las Vegas Wash.

3.3.4 Air Quality

Introduction

The plan area would be located within Clark County and traverses three air basins: Apex Valley, Black Mountains Area and Las Vegas Valley basins. Ambient air quality is primarily a result of the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin and the meteorological conditions. Ambient air quality standards (AAQS) have been developed by the Federal and state governments in order to establish levels of air quality which, when exceeded, may cause adverse effects to human health.

Regulatory Framework

The Nevada Division of Environmental Protection (NDEP) Bureau of Air Quality (BAQ) is charged with maintaining and improving the air quality for citizens of the State of Nevada. The Clark County Department of Comprehensive Planning and the Clark County Department of Air Quality Management (DAQM) review air quality issues within Clark County.

In 1990, the Federal government passed the Clean Air Act Amendments (CAAA). When the CAAA were created, the Las Vegas Valley was classified as a moderate non-

attainment area. Those regions that have a non-attainment status must implement a series of programs to achieve attainment and reduce PM₁₀ pollution, airborne particulate matter with a diameter of less than or equal to 10 microns.

Due to its classification as a moderate non-attainment area for PM₁₀, Clark County developed a Moderate Area State Implementation Plan (SIP) in 1991. In early 1993, the United States Environmental Protection Agency (EPA) reclassified the Las Vegas Valley to a "serious" non-attainment area for that pollutant. In 1994, the County Board submitted a new PM₁₀ air quality plan to the EPA, which provided for the implementation of best available control measures. More recently, in August 1997, the Board adopted the "Particulate Matter (PM₁₀) Attainment Demonstration Plan" for the Las Vegas Valley and submitted it to the EPA for review and approval.

Clark County is in attainment status for both the Clark County AAQS and the Federal NAAQS for all pollutants, except for Carbon Monoxide (CO) and Particulate Matter (PM₁₀) as described below. The State of Nevada has a separate set of Air Quality Regulations and its own state ambient air quality standards. These standards are quite similar to the Federal NAAQS. Air quality regulations administered by Clark County DAQM apply to actions within the county. These ambient air quality standards are more stringent than the Nevada and Federal standards and are obtained from the District Board of Health of Clark County Air Quality Regulations, Section 11, Ambient Air Quality Standards, revised 5/27/93.

The DAQM is primarily responsible for regulating all stationary and non-vehicular sources including construction sources of fugitive dust. According to Section 17 of their regulations, a plan-specific permit is required for construction activities involving surface disturbances greater than one-quarter acre, such as grading and trenching. This permit would include conditions requiring control of fugitive dust emissions, as defined in Section 41 of the regulations. Fugitive dust control measures have been incorporated into the Proposed Action.

Inventory Methods

Air quality monitoring data was obtained from the EPA and DAQM and was evaluated to characterize the existing air quality in the region. Meteorological data was obtained from the Western Regional Climate Center (WRCC), which is one of six regional climate centers in the United States.

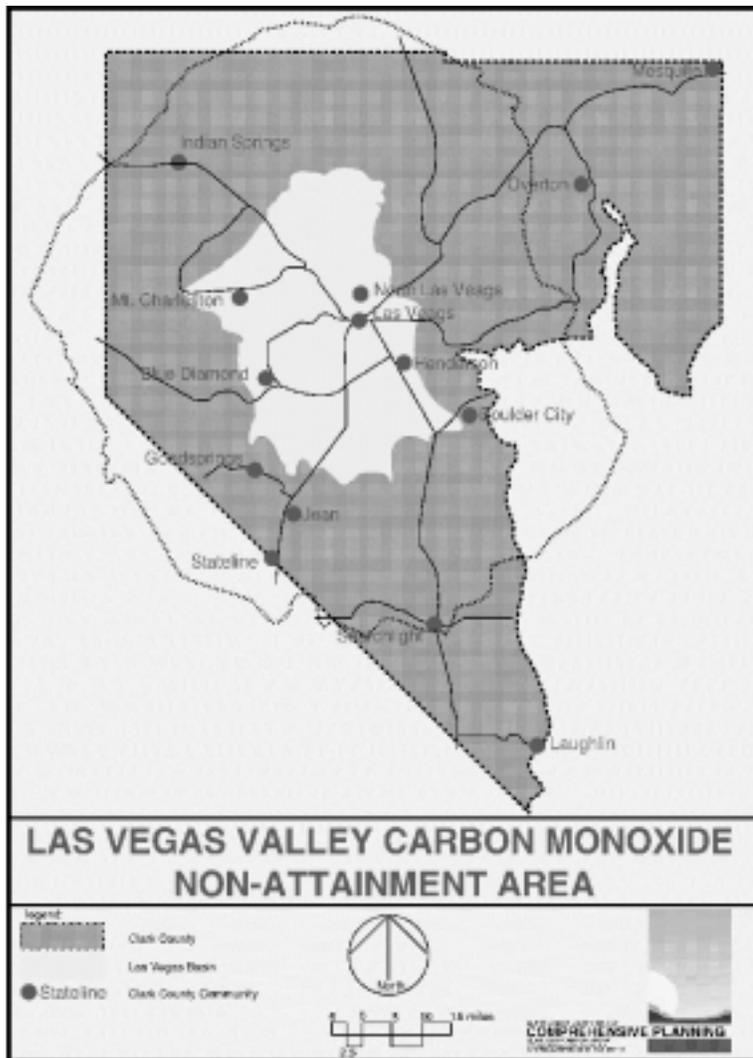
Inventory Results

Air Quality

The closest air monitoring stations to the plan area are located in Apex Valley and Boulder City, Nevada. The major air pollutants that are in non-attainment for Clark County are CO and PM₁₀, described below. Non-attainment areas are air quality control regions for which the EPA has determined that ambient air concentrations exceed national ambient air quality standards.

Carbon Monoxide

CO is produced primarily by incomplete fuel combustion in motor vehicles. CO has a toxic potential to human health. The major effects of CO occur near its sources (busy streets and freeways). There are two National Ambient Air Quality Standards (NAAQS) for carbon monoxide. The one-hour standard has a maximum allowable concentration of 35 parts per million (ppm). The eight-hour standard is a maximum average of 9 ppm over an eight-hour period. Areas that violate one or both of the ambient standards more than two times in a two-year period are classified as non-attainment areas for carbon monoxide. Refer to Figure 3-1 for a map of the CO non-attainment area.



Source CO State Implementation Plan, 2000

Figure 3-1 Las Vegas Valley Carbon Monoxide Non-Attainment Area

Previously, portions of the Las Vegas Valley violated the NAAQS for CO during the winter months. The number and severity of the CO violations caused the EPA to designate the Valley as a “moderate non-attainment area” on November 15, 1990. The Las Vegas Valley was later reclassified as a "serious" non-attainment area for CO.

The one-hour standard for CO has never been exceeded in the Las Vegas Valley. The eight-hour standard has not been exceeded since 1998 (F. Durosinmi, DAQM, personal communication, December 2003). As a result, the DAQM is in the process of applying for the Clark County airshed to be an attainment area. Refer to Figure 3-1 for a map of the CO non-attainment area. The dotted line around the non-attainment area (Basin 212) represents a 25-mile zone to consider sources that may contribute CO emissions.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Particulate matter pollution consists of very small liquid and solid particles floating in the air including dust, metals, smoke, soot and acids. Coarse particles (larger than 2.5 micrometers) often come from a variety of sources, including windblown dust, according to the SIP plan for particulates drafted in June of 2001. These coarse particles are less than 10 microns in diameter, or about one seventh the thickness of a human hair and are known as PM₁₀. Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. These fine particles (less than 2.5 micrometers) often come from fuel combustion, power plants and diesel buses and trucks.

The major sources of PM₁₀ exceedances identified by monitoring stations in Clark County were very closely related to wind gusts (F. Durosinmi, DAQM, personal communication, June 2003). In the Valley, fugitive dust from paved and unpaved roads, construction activities and disturbed vacant land are also known sources. It should be noted that wind gusts were in the 30 to 50+ mph range during the exceedances observed by the monitoring stations.

Information regarding exceedances was obtained from the Clark County web site for the years 1991 through 2001. A personal fax from Mr. Durosinmi, the air-monitoring supervisor, provided the additional 2002 information.

Since 1991, PM₁₀ was exceeded for the following number of days per year through 2002 (Table 3-6):

Table 3-6 PM₁₀ Exceedence Days by Year for Clark County

1991 - 4	1995 - 16	1999 - 9
1992 - 10	1996 - 16	2000 - 4
1993 - 2	1997 - 13	2001 - 3
1994 - 9	1998 - 6	2002 - 11

According to Clark County, the high number of exceedance days (11) in 2002 for PM₁₀ was caused by an unusual number of high wind events in the Valley (F. Durosinmi, DAQM, personal communication, December 2003).

3.3.5 Visual Resources

Introduction

The presence of a new high-voltage transmission line within the plan area is of concern to both land managing agencies and the public regarding its visual impact. The following issues were identified in the plan area:

- Residents from the City of Henderson expressed concern for neighborhood aesthetics.
- The BLM expressed concern for visual impacts in the Sunrise Management Area (SMA) Plan as a result of additional utility rights-of-way through the SMA.
- Clark County and environmental groups expressed concern for scenic intrusion upon viewsheds found in the Rainbow Gardens geologic area including proposed trailheads and scenic drives near milepost 27 of the plan area.

Inventory Methods

The visual inventory was conducted using principles derived from the BLM Visual Resource Management (VRM) system 8400 series manuals (BLM, 1984) and modified to accommodate urban landscapes. There are no formal guidelines for managing visual resources on private, state-owned lands or the other Federally-managed lands within the plan area. The VRM methodology provided a consistent inventory process across the study area for all public and private lands.

A six-mile wide plan area was inventoried to document existing visual resources for the 48-mile long proposed route. The study process included analysis of topographic maps and aerial photography (from March 2001), agency contacts, field reconnaissance and review of existing literature sources. The result is a consistently inventoried database used to assess impacts (Chapter 4) for each of the alternative corridors.

Visual resource maps can be found in Appendix A. Definitions of visual resource terminology and descriptions of the specific inventory methods used for gathering and completing the visual resource inventory are included in Appendix B.

Inventory Results

Much of the landscape has had some level of disturbance including freeways, highways, gas pipelines, other electric transmission lines, military operations, railroads and residential subdivisions.

Scenic Quality Class

Scenic quality classes were derived from a resource inventory. Table 3-7, Scenic Quality/Visual Integrity Comparison, depicts typical landscapes representing the range of scenic quality classes resulting from this inventory. Class A landscapes accounted for approximately 5 percent (11,201 acres), Class B accounted for approximately 5.4 percent (12,207 acres) and Class C landscapes accounted for 89.6 percent (202,916 acres) of the total area inventoried. The following paragraphs describe each of the scenic quality

Table 3-7 Scenic Quality/Visual Integrity Comparison

SCENIC QUALITY		VISUAL INTEGRITY	
REPRESENTATIVE PHOTO	DEFINITION	REPRESENTATIVE PHOTO	DEFINITION
	<p><i>Class A or Distinctive</i> - Outstanding areas where characteristic features of landform, rock, water and vegetation are distinctive or unique in the context of the surrounding areas. These features exhibit considerable variety in form, line, color and texture and have strong positive attributes of unity and intactness. A score of 25 points or more, as tallied on an individual field inventory sheet, results in a distinctive rating.</p>		<p><i>Class A or Unique / Cohesive</i> - Developed areas where the landscape appears intact, interesting and cohesive. The characteristic elements of line, form, color and texture hold the developed features and landscape together into distinctive areas, landscapes, or neighborhoods. Colors and textures are often seen repeated in these landscapes. Developments and land uses do not contrast with each other or with the landscape.</p>
	<p><i>Class B or Above Average</i> - Above average areas where features provide variety in form, line, color and texture. Landscape elements may not be rare, but provide sufficient visual diversity to be considered moderately distinctive. Features exhibit common variety in form, line, color, texture and have positive, yet more common attributes, of unity and intactness. The score of 18 to 24 points resulted in an above Average rating.</p>		<p><i>Class B or Average / Rural Landscape</i> - Developed areas where the landscape is less unique, interesting and cohesive. Patterns of land use and materials used in structures are varied and different colors. The sense of a cohesive place or neighborhood is not as strong in these landscapes. Colors and textures are not often seen repeated in these areas.</p>
	<p><i>Class C or Common</i> - Common to minimal areas have characteristic features with moderate to little variety in form, line, color and texture in relation to the surrounding region. The score of 17 points or less, as tallied from an individual field inventory sheet, resulted in a Common rating.</p>		<p><i>Class C or Representative</i> - Developed areas that appear heavily altered, do not form a sense of place or neighborhood and are not visually cohesive. The elements of line, form, color and texture are not often repeated in a cohesive manner. Developments and land uses are diverse and contrast with each other and with the landscape.</p>

classes identified in the plan area. Refer to Map 4: Visual Resources - High Sensitivity Views and Map 5: Visual Resources - Moderate Sensitivity in Appendix A.

Class A

Lake Las Vegas, located within the Henderson City limits, was considered Class A due to its predominance of vegetation, water, landform and diversity in color. Rainbow Gardens and Lava Butte located on public land north of Lake Las Vegas were also considered Class A due to their predominance of bold landforms and diversity in color and textures. All Class A landscapes occur on the central to southern portions from milepost 22 to 27.

Class B

Several Class B landscapes were identified in the plan area and typically consist of human-made features such as parks, golf courses and planned unit developments. These areas contribute to the urban landscape setting with introduced vegetation, color and water (residences near Equestrian Substation). Natural Class B landscapes are mostly associated with the lower foothills and the mountains of the River Mountains and McCullough Range near the southern portion of the plan area. Another Class B landscape consists of a large alluvial fan or bajada that drifts from Rainbow Gardens in a southwesterly direction towards the Las Vegas Wash. Near the central portion of the proposed route, a Class B landscape of foothills and mountains rise towards both Sunrise and Frenchman’s Mountain and display unique geologic formations and landforms.

Class C

The majority of the Class C rating includes nearly flat landscapes with minimal scenic diversity. Vegetation is sparse and consists of mixed desert scrub with creosote bush, yucca and cactus species interspersed along the plan area. Other Class C areas are found along southern portions of the plan area within urban environments where built features dominate the landscape and visual integrity is low.

Viewer Sensitivity Inventory

Viewer sensitivity levels were determined by consulting agencies, city officials, state and local transportation departments and through field investigations. Sensitive viewpoints identified in the study area were inventoried into five categories – residences, planned land use, parks and recreation areas and travel routes.

High, moderate, or low viewer sensitivity levels were assigned to each inventoried viewpoint. Generally, all residences, recreation areas or recreation destination roads were identified as a high. Moderate viewer sensitivity typically included planned land uses and general use roadways. Low visual sensitivity viewpoints were identified but not carried forward for analysis. Visibility/Distance Thresholds are illustrated on Maps 4 and 5 in Appendix A for high and moderate sensitivity viewpoints. The following paragraphs discuss each of the inventoried viewpoint categories.

Residences

All residences were considered high sensitivity due to high concern (user attitude) and long view duration. Residences are associated with the cities of Henderson and Boulder

City. Proximate and high visibility views occur on the central and southern portions of the plan area from residences within the city of Henderson.

Planned Land Use

Planned Land Uses were considered moderate sensitivity because the Proposed Action would precede construction of the planned uses. This includes those planned residential developments that, at the time of this analysis, have received preliminary plat approval and a planned college campus immediately southeast of Henderson, Nevada State College at Henderson. Proximate and high visibility views from these planned land uses would occur along the central and southern portions of the plan area.

Parks and Recreation Areas

Existing parks and recreation areas are located within either the Henderson City Limits or the River Mountains. Individual use and large gatherings occur at these locations, resulting in high viewer sensitivity (high use volume, high user attitude and moderate viewing durations). Proximate and high visibility views from these areas include the Clark County Wetlands Park near milepost 27 and the River Mountains Loop Trail. Planned parks and recreation areas include the city of Henderson Equestrian Park and four smaller parks contained within the Lake Las Vegas Resort. Planned parks and recreation were considered moderately sensitive because the Proposed Action would precede the construction of these planned areas.

Travel Routes

State Routes 146/5, 147, 166, 167 and U.S. Highway 93 near Boulder City are recreation destination roads. These routes have high viewer sensitivity due to the moderate to high user attitude, short duration of view and moderate user volume. Proximate and high visibility views from these routes would include the Proposed Action. Moderate sensitivity travel routes include State Routes 582 and 604, U.S. Highway 95, U.S. Highway 93 near Harry Allen Substation and Interstates 15 and 515. Proximate and high visibility views from the moderate viewer sensitivity travel routes would include the Proposed Action.

BLM Visual Resource Management Classes and Objectives

VRM (Visual Resource Management) Classes were inventoried and mapped within the plan area. GIS data provided by the BLM were utilized to determine the location and classification of management classes on BLM-administered lands. Map 2-9 found in the BLM Las Vegas RMP (BLM, 1998) was also used as a reference. VRM classes for BLM-administered lands within the plan area were established in this RMP.

Approximately 75 percent of the plan area is within BLM-administered Lands. Approximately 10 percent of these lands are VRM Class II designation; however, the Proposed Action does not cross any of these Class II areas. Seventy-five percent are Class III and approximately 15 percent are Class IV.

VRM Class II objectives are to retain the existing character of the landscape. Within Class II areas, actions may not modify existing landscapes or attract the attention of casual viewers. Management objectives for lands within VRM Class III allow for authorized actions that may alter the existing landscape, but not to the extent that they

attract or focus attention of the casual viewer. Class IV objectives allow for authorized actions that may create significant landscape alternations that would be obvious to the casual viewer.

The VRM objectives and management direction identified in the BLM RMP is to limit future impacts on the visual and aesthetic character of public lands. A summary of VRM impacts for the BLM-administered lands is found within the RMP on page S2-13 under Rights of Way Management, Alternative A: “Designation of corridors would help protect viewsheds by concentrating impacts within specific geographic areas and corridors would have moderate visual impacts.”

3.3.6 Cultural and Ethnographic Resources

Introduction

BLM and the cooperating agencies negotiated a specific Programmatic Agreement to satisfy compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) for the proposed transmission line project. The BLM Las Vegas Field Office serves as the lead Federal agency with respect to NHPA Section 106 compliance.

Far Western Anthropological Research Group Inc. (Far Western) was contracted by Nevada Power to conduct a cultural resources inventory of the project corridor in accordance with Nevada BLM Class III Inventory protocol (Barker 1990) and the 2001 State Protocol Agreement between BLM and the Nevada State Historic Preservation Office (SHPO). Ms. Ginny Bengston was contracted by Nevada Power to assist with Native American consultation requirements. She also undertook an ethnographic assessment aimed at identifying areas that tribes consider culturally significant and determining if construction of the transmission line might affect those areas.

For inventory purposes, the Area of Potential Effects (APE) included the right-of-way and minimally 100 feet on each side of it, extending beyond this 100 feet on one side to include existing roads. In addition, inventory was completed of a 100-foot wide swath overlying numerous other existing dirt roads considered corridor-access options. In one instance, the APE was drawn to include a resource near but outside of the study corridor: Gypsum Cave is included in the APE because of its high visibility and the level of concern that some in the archaeological community and Native American communities have for it.

Cultural Resources Inventory Methods

The cultural resources archaeological inventory included a records search, development of a research design, pedestrian survey of the study corridor to Class III inventory standards and preparation of an inventory and evaluation report (Nevada Cultural Resources Report No. CR5-2462(P)). Enhanced site recordation procedures were implemented that included technological characterization of flaked stone tool and debitage assemblages, quantification of tool classes and material types, in-field analysis of ground stone, as well as probing for intact subsurface cultural deposits. This level of effort was applied in order to obtain adequate information to evaluate the significance of the prehistoric and historic resources encountered.

The project area was intensively surveyed using a series of transects spaced no more than 30 meters apart. Typically a crew of three or four persons conducted a sweep survey of the corridor, while access roads were covered by one individual who surveyed a 10-15 meter wide strip of undisturbed land adjacent to the edge of an existing dirt road, walking down one side of the road and returning on the opposite side, resulting in 100-foot wide coverage. Lathe stakes marked the proposed centerline and the right-of-way limits throughout most of the corridor, facilitating survey spacing, orientation and location. In addition, high-resolution, project-corridor, aerial photo maps were provided and used during the fieldwork, showing the survey limits, existing roads, existing transmission-line towers and numerous landmarks.

In addition to the Class III inventory, an ethnographic study was undertaken, consulting with Native Americans in order to identify culturally significant areas that might be affected by the proposed project. Work completed as part of the ethnographic assessment included archival and literature review and contacts with several Native American tribes through meetings, field visits and interviews.

In satisfying Section 106 of the NHPA requirements concerning consulting with appropriate Native American tribes, the lead agency consulted with 12 Native American tribes and four Paiute bands that claim ancestral ties to, or traditional cultural use of, project area lands. All but one of these tribal entities are Federally recognized. In December 2002, BLM mailed copies of an interested parties letter under NEPA guidance, which included 16 tribal groups. Specific to Section 106 consultations, two subsequent mailings occurred during 2003, each to the tribal leaders of 16 groups. The first of these consultation letters provided a brief description of the project and requested tribal input concerning potential impacts to culturally significant areas within the APE. The letter also offered tribes the opportunity to meet with BLM representatives to discuss the project. Follow-up telephone calls succeeded in contacting all but two of the 16 tribal groups. A second letter summarized the results of the archaeological study and included a list of sites and isolated finds found during the inventory. Follow-up contacts resulted in two separate field visits with representative of three different tribal entities (Las Vegas Paiute Tribe, Moapa Paiute Tribe and Colorado River Indian Tribes) and three others requested and received a copy of the final archaeological inventory report. Details about the information gathered during communication with the tribes is provided in the ethnographic assessment report submitted (Bengston, 2003).

Cultural Resources Inventory Results

The records search indicated that much of the corridor had been previously inventoried, with numerous sites recorded in and adjacent to it. Some of these were found in the 1970's during work completed for the adjacent Navajo-McCullough and Intermountain Power Project transmission lines. Many, however, are in the Las Vegas Wash vicinity, where numerous archaeological studies have taken place, prompted by a substantial amount of high-end urban development and municipal infrastructure improvements for Las Vegas and Henderson.

The archaeological inventory identified a total of 56 sites and 168 isolated finds in the project area, with 32 of the sites previously recorded in some fashion, and 24 being newly found. In total, 31 of the sites are prehistoric only in age, and these include five Complex

Feature/Artifact Assemblage Sites that represent base-camp/habitation sites; 10 Complex Feature/Artifact Assemblage Fragile Pattern Sites; one Simple Milling/Pottery Assemblage; one Simple Flaked Stone Assemblage; five Quarries; eight Segregated Reduction Locations (SRLs); and one Petroglyph boulder. Five other sites are less definitively prehistoric in age; three rockshelters (two with rock walls, the other with charcoal fragments), a series of cairns and an enigmatic shallow, basin-shaped depression.

Of the remaining sites, 19 are historic-period only resources; ten thematically relate to transportation, three link to mining activities, two are associated with the construction of Hoover Dam, and four are unfocused trash scatters.

One site contains both prehistoric and historic components; the prehistoric component is a Complex Feature site with no associated assemblage, only a cluster of small, basin-shaped depressions; the historic component relates to mining activities.

Twenty-four of the sites have characteristics and sufficient integrity that qualify them as eligible for listing on the National Register of Historic Places (NRHP). These are listed in the cultural impacts table in Appendix D. None of the isolated finds qualify. Nineteen of the significant sites are prehistoric; five are historic period in age.

Consulted tribes identified only two culturally significant areas within the project area, both corresponding with eligible sites: Gypsum Cave (26CK5) and a petroglyph boulder (26CK6797). Contacted tribes did not specifically identify any of the other previously or newly recorded archaeological sites as culturally significant.

The Nevada SHPO concurred that 24 project sites are eligible for nomination to the NRHP, and all or relevant segments of the 32 other project sites are not eligible under any NRHP criteria.

3.4 Additional Resources Inventoried

3.4.1 Land Use

Introduction

The plan area has a mixture of privately owned lands and lands administered by various Federal, state and local agencies. Public land administered by the BLM is located throughout the plan area along with land managed by the USBR, Western, University of Nevada, Las Vegas (UNLV) and Clark County. Incorporated areas within the plan area include the cities of Henderson and Boulder City. The entire plan area lies within Clark County.

Inventory Methods

The inventory was compiled through an investigation and interpretation of existing maps and March 2001 aerial photographs within and adjacent to the plan area. The inventory data were collected within a 1.5-mile-wide plan area, 0.75 miles on either side of the assumed centerline of the proposed route. The existing mapped information was verified

by ground reconnaissance of selected portions of the plan area in September 2001 and January 2002. Key Federal, state and local land resource agencies were contacted to renew official information and to solicit further relevant information. A comprehensive listing of data sources is provided in the References section in Chapter 7.

The land use database was compiled in maps and used to graphically portray information relating to each component (see Appendix A, Map 3: Land Use).

Inventory Results

Land Jurisdiction

Land jurisdiction refers to the administrative authority of Federal, state or local governmental agencies. Jurisdiction does not necessarily imply land ownership. For example, privately owned lands may be subject to a local authority like a county or municipality. The following land jurisdictions were identified and delineated using BLM and Clark County Geographic Information System (GIS) data layers as well as agency maps.

Bureau of Land Management (USDI, BLM)

BLM is based on the principles of multiple use and sustained yield of the nation's resources including recreation, rangelands, timber, minerals, watershed, wildlife, fish and wilderness, air and scenic, scientific and cultural. A large portion of the plan area contains public lands managed by the BLM.

Bureau of Reclamation (USDI, USBR)

USBR has primary responsibilities as manager of Federal water resources and associated programs or facilities. The USBR lands are found in the southern half of the plan area.

Western Area Power Administration (Western)

Western markets and delivers cost-based hydroelectric power and related services within a 15-state region of the central and western U.S. The Western lands are situated in the southern portion of the plan area.

Additional Jurisdictions

Additional jurisdictions within the plan area include the National Park Service (NPS) lands associated with the Lake Mead National Recreation Area located on the eastern edge of the 1.5-mile wide land use study corridor. The State of Nevada, the University of Nevada Las Vegas and cities and counties are also included within the land use study corridor, as are portions of the cities of Henderson and Boulder City. The entire plan area is situated within Clark County.

Existing Land Use

Existing land use identifies the various surface structures, improvements and land use designations occurring within the plan area as of April 2003. Categories, listed below, were identified to differentiate between types of existing land use. Appendix A, Land Use Map identifies existing land use in the plan area.

- Residential

- Commercial
- Public
- Industrial
- Communication Facilities
- Air Facilities
- Linear Features
- Mining

Planned Land Use

Designated Utility Corridors

Section 503 of the Federal Land Policy and Management Act of 1976 (FLPMA) states that the Secretary of the Interior shall designate corridors to minimize adverse environmental impacts and the proliferation of separate right-of-ways (BLM, 2003). The BLM has a longstanding partnership with the Western Utility Group (WUG) concerning the planning, identification and designation of utility corridors in the western United States.

The Proposed Action would be located within a designated utility corridor for all but eight miles of the proposed route. Refer to Map 1: Proposed Alignment in Appendix A for the location of designated utility corridors within the plan area. The proposed route is located within portions of the following BLM designated utility corridors:

- Dry Lake Valley (3,000 feet wide)
- Black Mountain-Crystal (500/1,400/2,000 feet wide)
- Boulder-Primm North (2,000 feet wide)
- Boulder-Primm South (3,000 feet wide)

BLM Las Vegas Resource Management Plan

In June 1998, the BLM issued a final Las Vegas Resource Management Plan (RMP) and signed a ROD approving the plan in October 1998. The RMP provides a comprehensive framework for managing approximately 3.3 million acres of public lands administered by the Las Vegas Field Office. This plan guides the management of the public land resources for the next 20 years for portions of Clark County and southern Nye County in southern Nevada.

Standard Operating Procedures pertaining to lands within the RMP indicate that Federal land is available for rights-of-way purposes, except within designated rights-of-way exclusion areas.

The Sunrise Management Area Interim Management Plan

This Plan was approved in May 2000, as an interim plan for an identified project area within the Sunrise Mountain Special Recreation Management Area (SRMA) and Rainbow Gardens ACEC. The area is referred to as the Sunrise Management Area (SMA). The SMA is located in Clark County, approximately five miles east of Las Vegas. The SMA boundary is the same as the Sunrise Mountain SRMA and Rainbow

Gardens ACEC and includes 37,620 acres. The Plan focuses on 21,578 acres within the SMA.

Lake Mead National Recreation Area General Management Plan

The Lake Mead National Recreation Area (LMNRA) General Management Plan and Environmental Impact Statement were finalized in 1986. According to the LMNRA General Management Plan, (Easements, Utility Corridors and Memorandums of Understanding): “Various easements and utility corridors have been granted in the past. The National Park Service would generally oppose granting any further corridors; instead, additional use of existing corridors would be favored in the event there is a justified need for additional utility lines through the NRA.”

Clark County Comprehensive Plan

The Clark County Comprehensive Plan describes land uses throughout the county, provides for regional services and facilities and governs development within unincorporated areas. Plan components consist of land use maps and policies that define a development pattern suitable for the four unincorporated towns and surrounding undeveloped areas. Goals and policies relevant to transmission line siting within the land use plan and development guides encourage the joint use of corridors by utilities and use of existing corridors whenever possible.

Clark County Multiple Species Habitat Conservation Plan

The Clark County Multiple Species Habitat Conservation Plan is intended under Section 10(a) of the Federal Endangered Species Act to support the issuance, by the FWS, of a permit or permits (Section 10(a) Permit) which would:

- Allow the “take” of threatened or endangered species resulting from otherwise lawful activities on non-Federal properties within the county; and
- Allow the “take” of threatened or endangered species that are currently unlisted but may become listed in the future.

Additional Land Use Plans Inventoried

In addition to the areas described above, the following planned land uses were inventoried.

- Clark County School District
- City of Henderson Comprehensive Plan
- Boulder City Master Plan
- Southern Nevada Regional Policy Plan

Parks, Recreation and Preservation Areas

Wilderness

There are no designated Wilderness Areas within or adjacent to the plan area.

BLM Sunrise Mountain Instant Study Area

The Sunrise Mountain Instant Study Area is located at the eastern edge of Las Vegas and was designated in 1970 as Sunrise Mountain Natural Area. The area was identified as

having unique geologic, biologic and aesthetic values. A total of 29,475 acres were studied, and it was determined the area lacked wilderness characteristics. As a result, the BLM recommended that the study area be dropped from the wilderness review process. A portion of the BLM designated utility corridor passes through the Sunrise Mountain Instant Study Area. Activation and use of this portion of the utility corridor was contingent upon congressional action.

Nine thousand and nine hundred and fifty two (9,952) acres of the original 10,240 acres of the Natural Area continues to be managed as an Instant Study Area until such time that Congress either designates it as wilderness or releases it from further study. The other 288 acres, which run through the center of the ISA, have been released from further study through the Clark County Conservation Of Public Land And Natural Resources Act Of 2002, Public Law 107-282. A portion of these released acres have been designated as a 500-foot-wide utility corridor.

BLM Area of Critical Environmental Concern (ACEC)

Two BLM ACECs, Rainbow Gardens and River Mountains, are located in the plan area. Rainbow Gardens ACEC consists of 37,620 acres and contains geological, scientific, scenic, cultural (320 acres) and sensitive plant values. The River Mountains ACEC consists of 5,617 acres and contains bighorn sheep habitat and is a scenic viewshed for Henderson and Boulder City. Both of these ACECs have been designated right-of-way avoidance areas except within BLM-designated utility corridors. Both ACECs would be crossed by the assumed centerline of the Proposed Action within the Black Mountain – Crystal BLM designated utility corridor.

Additional Parks, Recreation and Preservation Areas Inventoried

In addition to the areas described above, the following parks, recreation or preservation areas can be found on Map 1: Proposed Alignment in Appendix A.

- Lake Mead National Recreation Area (LMNRA)
- Old Spanish National Historic Trail
- University of Nevada, Las Vegas
- Clark County Wetlands Park
- City of Henderson Parks and Recreation Department
- Lake Las Vegas Resort

3.4.2 Socioeconomics

Introduction

The socioeconomic analysis characterizes the human resources occupying the areas near the Proposed Action. Residences, places of work, institutions and their associated social and economic activities and facilities are subject to changes arising from construction and operation of the transmission line. This section provides a brief inventory of the status and trends of those resources as basis for assessing the socioeconomic impacts of the Proposed Action in Chapter 4.

Inventory Methods

Population characteristics are the principal measure of an area’s socioeconomic situation. The primary source of data on population is the decennial census of population and housing conducted by the Bureau of the Census, U.S. Department of Commerce. This resource was used to acquire data on population size, racial composition and housing status in the census tracts crossed or abutted by the various alternative alignments proposed for the Proposed Action. Additionally, the census mapping maintained by the Clark County Department of Comprehensive Planning’s Advanced Demographics office was used in this study.

Inventory Results

Population Characteristics

The areas traversed by the proposed route are on the outer northeastern, eastern and southeastern periphery of metropolitan Las Vegas. This area is largely open desert and population densities are low. However, there are instances of some portions of the proposed route being located in areas of higher population density.

Clark County in general and Las Vegas in particular are among the most dynamic economic and social regions in the country. The county’s population numbered 1.43 million in 2000, up 6.05 percent from 1999, and the CCDCP forecasts that the county population will exceed two million by the year 2012, despite a marked slowing in annual growth rates forecast for the coming decade (CCDCP, 2001). Total employment in July 2001 totaled 776,600, with 5.2 percent of the labor force unemployed. During 2000, the city was host to 35,849,691 visitors (CCDCP, 2001).

Eight census tracts are crossed or abutted by the proposed route, and their aggregate population in 2000 amounted to 28,701 persons. Table 3-8 lists the census tracts crossed by the proposed route by milepost. Details on the numbers and racial composition of the tracts’ residents are presented in Table 3-9. As a generalization, population densities are higher in the southern portion of the route, where the transmission line passes near the incorporated areas of Henderson and Boulder City. Census tracts near the urban areas are somewhat smaller in size, reflecting the higher densities of population. Numbers of residents in these tracts typically run 4,000 or more. In contrast, along the northern and central portions, the census tracts are very large while the numbers of inhabitants are smaller.

Table 3-8 Census Tracts by Milepost

Milepost		Miles (approx.)	Census Track
From	To		
0.0	2.7	2.7	59.02
2.7	15.4	12.7	56.13
15.4	18.3	2.9	61.02
18.3	20.4	2.1	56.13
20.4	26.6	6.2	61.01
26.6	28.4	1.8	54.11
28.4	35.4	7.0	54.31

Milepost		Miles (approx.)	Census Tract
From	To		
35.4	43.8	8.4	57.10
43.8	47.1	3.3	55.01
47.1	48.0	0.9	57.03
Total		48.0	

Racially, the population along the proposed route is relatively diverse. Whites (not including Hispanics) accounted for 77.3 percent of the residents, while Hispanic/Latinos represented 12.3 percent. Hispanic or Latino includes persons declaring multiple racial backgrounds besides Hispanic/Latino, including White, Black/African American, Native American and Other. Black/African Americans accounted for 4.4 percent, Native Americans for 1.1 percent, with Asians and other races accounting for the balance of 4.9 percent (persons declaring specified race alone).

At the time of the census, there were 12,811 housing units in the nine census tracts, of which 2,027 (15.3 percent) were vacant (CCDCP, 2001).

Economic Characteristics

Clark County's economy is one of the more dynamic and robust in the country, with gaming and related visitor spending providing the dominant stimulus. With more than 35 million visitors per year, Las Vegas has the cash flow of a considerably larger metropolitan area.

Nevertheless, there are also major commercial and industrial operations in the region providing a firm base to the region's prosperity and welfare. With a favorable business climate to encourage investment, the jobs created by these industries are responsible for much of the region's population growth, which is largely the result of in-migration from neighboring states.

In April 2001, the Las Vegas Metropolitan Statistical Area (MSA) registered 785,400 civilian jobs. The MSA is comprised of Clark and Nye counties in Nevada and Mojave County in Arizona. Clark County accounts for more than 97 percent of the MSA's population, which amounted to 1,408,250 at the time of the 2000 census (CCDCP, 2001). The job distribution is described in Table 3-10, Las Vegas MSA Civilian Employment.

Of interest to this study is the relatively large size of construction sector employment, which accounts for nearly 10 percent of all jobs in the area. This situation favors recruitment of local resident construction workers for the Proposed Action, which would tend to reduce the need to bring in large numbers of non-local workers and alleviate demand for transient accommodations and services.

Table 3-9 Harry Allen–Mead 500kV Transmission Line Proposed Alignment: Year 2000 Census Data

POPULATION CHARACTERISTICS	Census	Totals	Percent Distribution								
	Tract 54.11	Tract 54.31	Tract 55.01	Tract 56.13	Tract 57.03	Tract 57.10	Tract 59.02	Tract 61.01	Tract 61.02		
Total:	4,865	4,353	4,365	4,165	2,702	2,774	1,525	2,055	3,952	30,756	100.0%
Not Hispanic or Latino:	4,303	3,940	4,227	3,803	2,314	2,630	1,014	1,920	2,946	27,097	88.1%
White alone	3,744	3,590	4,070	3,687	1,740	2,448	802	1,570	2,118	23,769	77.3%
% White alone	77.0%	82.5%	93.2%	88.5%	64.4%	88.2%	52.6%	76.4%	53.6%	77.3%	
% Non-White	23.0%	17.5%	6.8%	11.5%	35.6%	11.8%	47.4%	23.6%	46.4%	22.7%	
Black or African American alone	170	104	43	22	363	42	2	105	518	1,369	4.5%
American Indian and Alaska Native alone	38	31	26	21	16	11	155	11	14	323	1.1%
Asian alone	193	112	29	11	136	89	18	158	138	884	2.9%
Native Hawaiian and Other Pacific Islander alone	23	15	8	13	5	4	6	10	22	106	0.3%
Some other race alone	6	5	4	0	0	1	0	5	11	32	0.1%
Two or more races	129	83	47	49	54	35	31	61	125	614	2.0%
Hispanic or Latino:	562	413	138	362	388	144	511	135	1,006	3,659	11.9%
% Hispanic or Latino	11.6%	9.5%	3.2%	8.7%	14.4%	5.2%	33.5%	6.6%	25.5%	11.9%	
White alone	375	192	97	160	107	86	148	80	528	1,773	5.8%
Black or African American alone	3	6	3	3	4	0	1	0	12	32	0.1%
American Indian and Alaska Native alone	6	9	3	1	4	1	27	3	1	55	0.2%
Asian alone	6	2	0	0	1	1	0	0	3	13	0.0%
Native Hawaiian and Other Pacific Islander alone	0	0	0	0	0	0	0	0	0	0	0.0%
Some other race alone	140	161	34	169	81	47	329	40	375	1,376	4.5%
Two or more races	32	43	1	29	191	9	6	12	87	410	1.3%
HOUSING CHARACTERISTICS											
Total:	2,148	1,510	2,449	1,913	1,325	1,459	570	763	1,437	13,574	100.0%
Occupied	1,900	1,465	2,116	1,393	869	1,222	491	716	1,328	11,500	84.7%
Vacant	248	45	333	520	456	237	79	47	109	2,074	15.3%
% Vacant	11.5%	3.0%	13.6%	27.2%	34.4%	16.2%	13.9%	6.2%	7.6%	15.3%	

Source: U.S. Census Bureau, 2001

Table 3-10 Las Vegas MSA Civilian Employment April 2001

Industry Sector	Reported No. of Jobs	% Distribution
Mining	1,800	0.2 %
Construction	71,300	9.1 %
Manufacturing	25,000	3.2 %
Transport, Communication & Public Utilities	44,800	5.7 %
Wholesale Trade	24,300	3.1 %
Retail Trade	145,800	18.6 %
Finance, Insurance & Real Estate	37,300	4.7 %
Hotels, Gaming & Recreation Services	194,600	24.8 %
Other Services	155,400	19.8 %
Government	85,100	10.8 %
Total	785,400	100.0 %

Source: Clark County Department of Comprehensive Planning, 2001

Environmental Justice (Executive Order 12898 of February 11, 1997)

All Federal actions must address and identify as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States. The criteria for a finding of possible environmental justice problems is the occurrence of more than 50 percent of the population being minority or low-income in the proposed project area of influence. As discussed in the sections above, there are no occurrences of disproportionately high percentages of minority or low-income populations who might be impacted.

3.4.3 Health and Safety

Introduction

Electric and Magnetic Fields

The presence of high voltage transmission lines tends to increase public concerns about the safety of electric and magnetic fields (EMF). However, EMFs are present wherever electricity flows around appliances, in offices, schools, homes and power lines. Electric fields are invisible lines of force created by voltage and are shielded by most materials. Magnetic fields are invisible lines of force created by current and are not shielded by most materials, such as lead, soil and concrete. These fields are low-energy, extremely low frequency fields and should not be confused with high-energy or ionizing radiation such as X-rays and gamma rays.

Electric fields from high voltage transmission lines can produce small amounts of electric charge on nearby conductive objects, an action known as coupling or induction. Magnetic fields are produced primarily when induction impacts long and generally parallel objects (e.g., pipelines, railroads and fences) that have an electrical ground at some point of the object.

Electric field safety is addressed in the National Electric Safety Code. Federal standards do not exist for either environmental or occupational levels of power frequency magnetic fields.

Hazardous Materials

Hazardous materials or hazardous wastes are another source of concern. A hazardous materials inquiry was conducted along the study corridor to identify recognized environmental conditions that may exist.

Inventory Methods

The Proposed Alignment map (Map 1 in Appendix A) was used to identify the transmission lines, pipelines and railroads that parallel or cross the corridor.

Federal and state environmental incident databases, provided by VISTA Information Solutions (January 16, 2002), were reviewed to determine hazardous materials sites located within the proposed transmission line right-of-way.

Inventory Results

EMF Corridor Assessment

There are several operating power lines, pipelines and railroads in the plan area. Refer to Table 2-2 in Chapter 2 for a list of all potential transmission line and railroad crossings in the plan area. The Proposed Action would parallel existing transmission lines within an existing utility corridor for all but approximately eight miles of the route. Refer to Map 1: Proposed Alignment for the location of existing linear features in the plan area.

Electric and Magnetic Fields Indirect Exposure

The majority of human exposure to magnetic fields is generally from electronic appliances and wiring inside the home or office. As discussed above, power lines are also a source of electric and magnetic fields. Some epidemiological studies conducted in community settings have reported weak associations between childhood cancer and estimates of exposure to magnetic fields. More recent studies have concluded that magnetic fields do not themselves have the energy to directly cause cellular DNA damage that leads to leukemia or other cancers, nor does exposure to magnetic fields interfere with natural cell repair mechanisms (Lloyd, 2003).

Hazardous Materials Corridor Assessment

The VISTA report identified two Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) sites located near or within the proposed right-of-way: The Henderson Landfill and the Henderson Lead Contamination Soil Site. Both appear to be located on either side of the right-of-way east of Henderson, Nevada near mileposts 25.5 and 27. The Henderson Landfill is located approximately one mile west of the right-of-way. The Henderson Lead Contamination Soil site appears to be centered approximately one mile east of the site. According to the VISTA report, the last Federal action on the landfill site was in completed in 1993. The last action at the soil contamination site is reported as July 1992.

The Mead Substation (terminus for the Proposed Action) was listed in the VISTA report as a leaking underground storage tank (LUST) site. According to the report, there was a confirmed release of total petroleum hydrocarbons and solvents in February 1995. The LUST site at Mead Substation was reportedly closed.

No other properties expected to affect the construction or operation of the proposed transmission line or substations were identified during the course of the VISTA database review. A summary of the contents of the VISTA report is included in Appendix C.

3.4.4 Water Resources

Introduction

This section addresses the environmental baseline condition of water resources in the Harry Allen–Mead 500kV Transmission Line plan area. Descriptions of water resources in the plan area are included for surface waters (perennial and intermittent waterways), groundwater, wetlands and floodplains. Appendix A, Map 2: Biological Resources identifies water resources and wetlands relative to the plan area. Impacts are identified and discussed in Chapter 4. A discussion of the regulatory framework and inventory methods and results is provided below.

Regulatory Framework

Clark County, the EPA and the Nevada Division of Environmental Protection (NDEP) regulate water resources and water quality in the plan area. Applicable Federal, state and local water quality requirements are described in the following paragraphs.

Clark County

The plan area is located entirely within Clark County. The Clark County Board of Commissioners is designated as the area-wide water quality management planning organization within Clark County. Surface and groundwater quality in Clark County are under the jurisdiction of the Clark County Regional Flood Control District.

Activities conducted within the boundaries of the Clark County Wetlands Park would require a Conditional Use Permit issued by Clark County. The permit would specify the actions, conditions and mitigation measures required for conducting activities within the Wetlands Park.

Stormwater Pollution Prevention Plan

The Nevada Bureau of Water Pollution Control oversees and enforces Nevada’s stormwater program. If construction activities for the Proposed Action were anticipated to discharge stormwater to waters of the U.S., Nevada Power would be required to obtain coverage under Nevada’s Construction Stormwater General Permit as required by the National Pollutant Discharge Elimination System (NPDES) program authorized by the Federal Clean Water Act (CWA). The General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which must be prepared before construction begins.

Clean Water Act Section 404 Permits

Construction activities involving excavation or placement of fill material into waters of the U.S would required a permit under section 404 of the Clean Water Act from the U.S. Army Corps of Engineers (USACE). Excavation and fill activities required for the Proposed Action would be authorized under a Nationwide Permit (NWP) (McNure 2002). If required by the USACE, a mitigation and monitoring plan would be developed in coordination with the appropriate resource agencies and a final plan would by the USACE.

Inventory Methods

Existing data including previous studies, publications and maps were used to complete the water and related features inventory. Nevada Floodplains were identified from Federal Emergency Management Agency (FEMA) flood boundary digital maps. Several reports published by the Nevada Division of Water Planning were also used in identifying and characterizing the water resources and related features in the study corridor. Wetlands information was obtained from 1:250,000 scale National Wetlands Inventory (NWI) maps. Inventoried features were verified with aerial photography and site visits to inspect sensitive water features. A preliminary delineation of wetlands and Waters of the U.S. in the plan area was completed in March 2003 by Power Engineers, Inc.

Inventory Results

Surface Waters

The plan area transects four watersheds: the Las Vegas Wash, Lake Mead, Muddy River and Ivanpah-Pahrump Valley watersheds. A network of poorly defined, ephemeral washes characterizes these four arid watershed systems in the plan area.

The characteristically arid environment of southern Nevada results in the absence of naturally occurring perennial streams, lakes, reservoirs or ponds in the plan area. The Las Vegas Wash is the primary drainage for the plan area and the Las Vegas Valley. The Las Vegas Wash is fed by urban runoff, groundwater, treated wastewater, urban and agricultural irrigation and stormwater. Due to constant inflow of treated wastewater, the Las Vegas wash has become a perennial waterway with an average flow of 153 million gallons per day or 220 cubic feet per second (LVWCC, 2001).

There are many ephemeral washes present that support little or no riparian community. These washes carry stormwater as well as urban runoff in the plan area to the Las Vegas Wash and eventually Lake Mead, which is located to the east of the plan area.

Wetlands

No wetlands, as defined by the USACE, were identified in the Las Vegas Wash or elsewhere in the plan area.

The plan area transects approximately 0.4 miles of the Clark County Wetlands Park adjacent to the Las Vegas Wash. According to Clark County, all lands within the Park boundaries have been treated as wetlands (Jeff Harris, Clark County Parks, personal communication, January 11, 2002).

Floodplains

The Proposed Alignment would cross approximately 1.8 miles of FEMA-defined 100-year floodplains. The locations of 100-year floodplains in the plan area are identified on Map 2: Biological Resources in Appendix A.

3.4.5 Geology and Soils

Introduction

The following sections inventory the existing geology and soils of the plan area. An inventory of mining operations, mining claims and/or mineral rights are discussed in Section 3.4.1 Land Use.

Inventory Methods

Literature relevant to the assessment of the geology was reviewed and included information from the Nevada Bureau of Mines and Geology (NBMG), USGS, Clark County GIS Management Office (GISMO), Clark County Regional Flood Control District, Nevada Power, BLM, University of Nevada Reno and various county and city agencies. In addition, individuals from various agencies were interviewed to gain more information.

Soils data and related information were acquired from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service, Southern Nevada Resource Area and from previous studies in the vicinity of the plan area. This information came in the form of two published soil surveys and additional unpublished maps, data and other information.

Inventory Results

Geology

The plan area lies within the southern margin of the Great Basin in the Basin and Range physiographic province characterized by a series of generally north-trending mountain ranges separated by alluviated valleys.

The northern and southern portions of the study area are underlain by unconsolidated Quaternary alluvium. This term applies to unconsolidated materials that differ widely in character and origin. The alluvium is present in a variety of forms including clay, silt and sand on the old flood plains composed of coarse, gravelly deposits spread by sporadic sheet floods on wide slopes bordering high ranges; boulder deposits in alluvial fans built up by temporary streams that issue from narrow canyons; windblown sand forming irregular sheets or dunes; and heaps of coarse slide rock forming talus slopes below steep cliffs (Longwell, et al., 1965).

Mineral Development

The majority of the study area is designated as having low to moderate mineral potential except in areas designated as private lands or Lake Mead National Recreation area. The only mine identified in the plan area includes the PABCO Gypsum facility located in the

north-central portion of the plan area. PABCO mines rock gypsum and manufactures dry wall.

Soils

Soils found within the plan area fall into three broad descriptive categories: 1) deep, well drained soils on older flood plains, adjacent stream terraces and alluvial fans; 2) deep, well drained soils on recent alluvial fans, sand sheets and similar features; and 3) shallow soils on hills and mountains interspersed with rock land, rock outcrops and badland.

There are seven general soil map units within the plan area. Following is a brief description of these soil map units and associated erodibility.

- The Bard-Colorock-Tonopah group is comprised of deep soils on broad alluvial fans and old terraces. Erosion potential is low for water and ranges from very slight to moderate for wind.
- The Rock land–St. Thomas group consists of rock land and shallow soils on mountains and colluvial foothills. Erosion potential is low for water and very slight for wind. There would be little or no erosion potential for areas mapped as rock land.
- The Rock Outcrop-St. Thomas-Akela group consists of rock outcrops and shallow and very shallow soils on hills and mountains. Erosion potential is slight to low for water and from none to low for wind. There would be little or no erosion potential for areas mapped as rock outcrop.
- The Jean–Arizo group consists of very deep soils on recent alluvial fans. Erosion potential is low for water and ranges from slight to moderate for wind.
- The Bluepoint-Knob Hill group consists of very deep soils on sand sheets. Erosion potential is low for water and ranges from high to very high for wind.
- The Caliza-Aztec group consists of very deep soils on fan terraces. Erosion potential is slight to low for water and from very slight to high for wind.
- The Land-Spring group consists of very deep, salt-affected soils on alluvial fans. Erosion potential is low for water and high for wind.

3.4.6 Paleontological Resources

Introduction

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) reviewed pertinent paleontology and geologic literature, consulted the locality records in the Regional Paleontologic Locality Inventory (RPLI) at the SBCM and conducted a field survey of the project corridor. The results of this study are detailed in a technical report, *Paleontologic Resources Assessment and Treatment Plan (PRATP)* on file with the BLM.

Literature research and institutional records searches resulted in the designation of high, low or undetermined paleontological sensitivity for all portions of the project area. Provisions to mitigate adverse impacts to significant nonrenewable paleontological

resources were based upon these determinations of potential paleontological sensitivity. Sedimentary units with high potential for containing significant paleontological resources are determined to have high paleontologic sensitivity. Rock units containing no or a very low density of fossil remains are determined to have low paleontologic sensitivity. Poorly studied rock units, or ones that have limited exposure(s) in the project area but elsewhere contain fossil remains have an undetermined sensitivity. In some instances the undetermined sensitivity unit may overlie a high sensitivity unit.

The preservation of plant or animal remains as fossils is an extremely rare occurrence. Those of significant scientific interest provide data on the evolutionary relationships and developmental trends among organisms; provide data useful in determining the age(s) of the rock unit, informing on the depositional history of a region and timing of geologic events; provide data on the development of biological communities or interaction between paleobotanical and paleozoological biotas; demonstrate unusual or spectacular circumstance in the history of life; and/or are in short supply or have a limited distribution and risk being destroyed by natural elements, vandalism or commercial developments or exploitation.

Paleontological Resources Inventory Methods

The SBCM conducted an assessment of the paleontologic sensitivity of rock units exposed throughout the proposed project corridor. The corridor crosses through two areas of long-standing geological interest, the Rainbow Garden Geologic Preserve and the BLM Sunrise Management Area (refer to Map 1 in Appendix A). The assessment included review of pertinent paleontologic and geologic literature, a check of locality records, and a field survey of the proposed transmission line corridor and its associated stations and access roads to identify surface outcrops and exposed fossil resources within the APE. The study was conducted under the direction of Kathleen B. Springer, Senior Curator of Geological Sciences for the SBCM and under Scientific Paleontological Collecting Permit No. N-75218, issued by the Nevada BLM to the SBCM.

The project area was covered at a Class III level of inventory. The corridor surveyed was 200 feet wide on average, with an additional 100-foot buffer on either side, although this width varied somewhat along the length of the alignment. Two pedestrian transects were traversed, one on either side of the centerline, spaced approximately 30 meters from each other and approximately 15 meters from the centerline. The corridor was surveyed by a field crew of five members, generally working in teams of two individuals each, along the entire length of the transmission line. Significant fossil resources were documented when encountered. The stratigraphy, lithology and geomorphology of fossil-bearing sediments, and contextual data from the fossils themselves, including taphonomic data, were recorded where appropriate.

The potential for cave openings in limestone rocks was also assessed. Paleozoic limestone outcrops were examined not only to confirm the presence of time-diagnostic invertebrate remains that might be present, but also to seek evidence of fissures or surface cracks that might lead to subsurface cave deposits potentially containing remains of Pleistocene and/or early Holocene fossils.

Finally, the presence of wood rat (*Neotoma*) middens in the corridor was also evaluated. Middens have been previously employed to track climatic shifts and changes in plant

distribution in the Great Basin and the Mojave Desert throughout the later part of the Pleistocene Epoch ($\pm 40,000$ years before present [BP] to $\pm 11,000$ years BP), as well as through much of the Holocene Epoch ($< 11,000$ years BP) and so have high paleontologic sensitivity.

The field survey was implemented to clearly and distinctly delineate the various exposed and subsurface geologic formations on site, while determining if paleontologic resources were present. When present, their potential significance was assessed. As fossils were encountered, their exact location was recorded using handheld Global Positioning System (GPS) transeivers, and the presence of the fossils was documented in field notes with preliminary field identifications. No fossils were collected during the field survey.

The primary focus of the survey was to identify paleontologically sensitive sedimentary exposures present within the proposed project corridor and to target significant paleontologic resources requiring preservation in advance of construction-related excavation. This focus ensured that resources would be preserved from adverse impacts so that the data provided by the resource(s) would not be lost to science. The field reconnaissance was further structured to address specific research concerns, if at all possible; although, the fact that resource recovery was deferred until a later time limited the amount of information gleaned from identified sites.

Paleontological Resources Inventory Results

The field reconnaissance resulted in the identification of 19 previously unrecorded paleontologic resource localities. All of these localities were identified from surface exposures. These localities were recorded from exposures of the Callville Limestone (late Mississippian Period, through Pennsylvanian Period, to early Permian Period), the Kaibab Formation (middle Permian Period), the Thumb Member of the Horse Spring Formation (Miocene Epoch) and the Muddy Creek Formation (later Miocene and early Pliocene Epochs). All paleontologic localities are sited on lands administered by the BLM.

Beyond these 19 previously undocumented localities, Gypsum Cave is located within the project study corridor. This locality was quite thoroughly excavated in the 1930s and yielded fossil remains of extinct Pleistocene megafauna, including Shasta ground sloth (*Nothrotheriops shastensis*), large and small horse (*Equus* spp., including a small hemionine or “stilt-legged” species), llama (*Hemiauchenia*), llama-like giant camel (*Camelops*) and sheep (*Ovis canadensis*). These fossils date to the latest Pleistocene Epoch; a radiocarbon date of $11,690 \pm 250$ years BP was obtained from a dung sample from the cave. Gypsum Cave is the first site in southern Nevada to yield fossils of extinct ground sloth.

Unlike other regional solution caves, however, the shelter provided by Gypsum Cave and the extreme aridity of the region have resulted in an excellent degree of preservation. Gypsum Cave has yielded extremely rare mummified remains of extinct Pleistocene animals, most notably the Shasta ground sloth. Hide, hair, bones and extensive dung of these extinct sloths have all been recovered from Gypsum Cave. These remains are unique paleontologic treasures, for they provide a wealth of data that skeletons alone cannot. Much of what is currently known about the appearance and dietary habits of the extinct Shasta ground sloth has been gleaned from the spectacular fossils recovered from

Gypsum Cave. The fossils recovered in the 1930s from Gypsum Cave are now housed at the Natural History Museum of Los Angeles, and their study is ongoing.

Locality data have been entered into the RPLI at the SBCM under locality numbers SBCM 2.11.67 through SBCM 2.11.84 and SBCM 2.7.1-2.7.2. The information recorded in the RPLI is presented in a technical study prepared by the SBCM (January 2004). Preliminary fossil identifications based upon field examination consist of 11 wood rat middens; six ripple mark and/or bird (*Aves*) trackways, all in the Thumb Member of the Horse Spring Formation; one plant or wood impression in the Thumb Member of the Horse Spring Formation; and one location with an Ostracoda shell, in addition to the fossil assemblage at Gypsum Cave. Resource recovery, laboratory preparation and professional identification will provide more precise taxonomic assignments for many of these fossils.

Chapter 4

Environmental Consequences

4.1 Introduction

The potential environmental consequences described in this chapter are based on the environmental effects that would result from the construction, operation and maintenance of the Proposed Action. A detailed discussion of the specifications and construction of the Proposed Action can be found in Chapter 2.

Impact Assessment

To identify project-related impacts, changes to the environment that would result from construction, operation and maintenance of the Proposed Action were compared to the existing environment as described in Chapter 3. Key resources, as identified during internal and external scoping and described in Chapter 3, are presented first in this chapter followed by additional resources that are potentially affected.

The types of impacts that could occur were defined, and impact locations were identified. Impacts can be direct or indirect, short-term or long-term. The impact locations were recorded by mile along the study corridors. This information is summarized in the resource sections that follow with data tables provided in Appendix D.

The exact location of each structure cannot be determined until final design is complete. Therefore, assumptions were made to determine impacts of the Proposed Action within a study corridor. The size of the study corridor varied by resource and is described in Chapter 3 and shown on resource maps in Appendix A. To quantify ground-disturbing impacts from the Proposed Action within the study corridor, the topography and existing land use were identified and categorized as part of the initial project design phase. Areas identified as having flat or gently sloping terrain and existing access roads were assumed to have fewer miles of ground disturbance than steep areas with few existing roads.

Disturbance was quantified for both temporary and permanent disturbance to estimate amount of acreage disturbed. Assumptions are summarized in Table 4-1. Using these assumptions, an estimated 165.5 acres would be permanently disturbed through the construction, operation and maintenance of the Proposed Action, while an additional 125.1 acres would be temporarily disturbed. Ground disturbance would be recalculated for the BLM Plan of Development when final design is complete and the exact locations of structures and roads are known.

Tables identifying ground-disturbing impacts for botanical, wildlife, visual, land use and water resources by mile are included in Appendix D.

Table 4-1 Ground/Access Disturbance Model

Ground Disturbance Level	Mileposts	Assumptions
1	0.0 to 3.5 6.0 to 26.0 28.0 to 36.0 42.0 to 48.0	Existing improved roads available for use as main access Slight to moderate slopes No improvements would be necessary to existing access roads New 800ft x 24ft spur roads would be built from access road to each structure Only lattice tower structures used- 5 per mile Permanent ground disturbance – 3.3 ac/mile Temporary ground disturbance – 2.8 ac/mile
2	26.0 to 28.0	Same as Level 1 except steel pole structures (8 per mile) used instead of lattice towers Permanent ground disturbance – 5.3 ac/mile Temporary ground disturbance – 4.2 ac/mile
3	36.0 to 42.0	Mostly two-track or narrow unimproved roads available as main access Slight to moderate slopes Existing roads and other disturbed areas would be improved (mowing/grading) to 24feet wide per mile of transmission line New 800ft x 24ft spur roads would be built per structure Only lattice tower structures used – 5 per mile Permanent ground disturbance – 4.8 ac/mile Temporary ground disturbance – 2.8 ac/mile
4	3.5 to 6.0	No existing access roads available Moderate to steep slopes 50ft wide x 1.2 miles of new access roads per mile of transmission line 24ft wide x 40ft of new spur roads per structure Only lattice tower structures used – 6 per mile Permanent ground disturbance – 8.7 ac/mile Temporary ground disturbance – 3.3 ac/mile

Mitigation Measures

Once impacts to environmental, cultural and human resources were identified for the Proposed Action, mitigation measures were examined to see if they could be effective in reducing or eliminating impacts. Management practices that would minimize or eliminate impacts to the environment that were part of the Proposed Action are listed in Chapter 2. Nevada Power committed to these measures on a nonspecific or plan-wide basis prior to impact assessments. These management practices were considered when assessing initial impacts. Mitigation consists of measures or techniques developed after impacts were identified and assessed.

Impacts remaining after applying any or all mitigation measures are termed residual impacts. Impacts and associated mitigation measures are discussed in detail within each resource section.

No Action

The no-action alternative, as described in Chapter 2, Section 2.2.1, would result in no construction of transmission facilities within the identified project area. Nevada Power’s purpose and need to increase transmission capacity between its Harry Allen Substation and Western’s Mead Substation would not be met.

If the no-action alternative were selected no impacts would occur to biological, water, air, visual or cultural resources as a result of the Proposed Action within the project area. However, the no-action alternative would likely impact Nevada Power’s ratepayers and the Las Vegas economy due to Nevada Power’s inability to provide greater reliability and capacity for their transmission system. Nevada Power could not meet existing and future energy demands or complete their contractual obligations to various power producers for transmission services.

The Las Vegas Valley could also experience economic impacts due to Nevada Power’s inability to import power to meet growing electrical demand in the Las Vegas area. The no-action alternative would inhibit Nevada Power from fulfilling their Refiled 2001 Resource Plan approved by the Public Utility Commission and Governor Guinn’s 2001 Nevada Energy Protection Plan, which not only helps stimulates business growth within the state but provides support against possible blackouts that have occurred elsewhere in this country

If the no-action alternative were selected, Nevada Power would be required to take additional measures to compensate for the anticipated shortfall in the supply of electric power for the Las Vegas Valley. Siting alternatives for a 500kV transmission system, as identified in Chapter 2, would not optimize the use of existing utility corridors, minimize environmental impacts or minimize engineering and constructability expense. An alternative 500kV transmission line location would be very difficult to identify and based on Nevada Power’s Siting Study results, would be longer than the Proposed Action. As such, siting alternatives would create more impacts to resources and higher cost and engineering difficulties for Nevada Power.

Use of 230kV voltage in place of the 500kV transmission system would reduce visual impacts of the individual structures. However, as discussed in Chapter 2, four new transmission systems and major upgrades to existing substations would be needed to provide the same level of transmission that the Proposed Action would provide. Results of utilizing a 230kV system would include greater impacts to all resources, a much higher cost to Nevada Power and a greater likelihood of power outages.

4.2 Key Resources

4.2.1 Botanical Resources

Introduction

Potential impacts to botanical resources associated with construction activities could include (a) crushing and/or removal of native vegetation, (b) grading and compaction of

soil, and (c) loss or displacement of individuals and/or habitat for sensitive species of plants.

Impacts to botanical resources were analyzed by mile within a 0.5-mile wide study corridor. Impacts to botanical resources at each tenth mile segment were assessed according to resource sensitivity and expected levels of ground disturbance. Mitigation measures were considered and a final estimate of residual impacts was made. Ground disturbance information (Table 4-1) enabled a calculation of the total number of acres potentially disturbed for the Proposed Action. Refer to Appendix D for a detailed impact assessment table.

In Chapter 3, plant species of special concern were identified for the plan area. Those plant species that were identified in Chapter 3 as not likely to occur in the plan area would not be impacted; therefore, they are not discussed in this section.

Impacts to Botanical Resources

This section describes the types of potential impacts that may occur to botanical resources in the plan area because of construction, operation and maintenance of the Proposed Action. Recent surveys were conducted during extreme drought conditions and although few plants were located, more plants could exist in the plan area. It was apparent as the survey was being performed that many plants were unable to germinate because of poor growing conditions. Consequently, survey information and the following impact assessment includes potential habitat for species of concern even though no plants were encountered.

A majority of the sensitive plants within the plan area are located in gypsum soils. Construction, operation and maintenance activities within the gypsum soil areas could cause an estimated 81.4 acres of permanent disturbance and 67.2 acres of temporary disturbance. The gypsum endemics are known for transplanting and seed germination problems; therefore, avoidance is the preferred mitigation for this species.

Sticky ringstem (Anulocaulis leioselinus)

Sticky ringstem was found between mileposts 16.4 and 19.8 within the Sunrise Management Area (SMA). Therefore, this plant species would be potentially impacted by the proposed project within this area. Like Las Vegas bearpoppy and Las Vegas buckwheat, sticky ringstem is a gypsum endemic, so potential habitat also occurs where gypsum soils exist.

As with the Las Vegas bearpoppy and buckwheat, avoidance is the preferred mitigation for this species. Impacts involve loss of habitat and/or loss of individuals during construction, operation or maintenance activities. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance and limit new or improved access by the public.

Las Vegas bearpoppy (Arctomecon californica)

The potential for loss of bearpoppy habitat occurs from mileposts 15.0 to 19.8. In addition, gypsum soils extend from milepost 14.0 to the Mead Substation, although these soils are patchy in some places. While the gypsum may be a known habitat feature for the

rare plants, aboveground plant distribution is not apparent in all locations and may vary year to year. However, for this report, all gypsum soils were identified and are considered potential bearpoppy habitat.

The proposed corridor also crosses the SMA. Areas within the SMA have been identified for protection of the bearpoppy (1,010 acres), along with restoration to improve survivability of the bearpoppy populations. The study corridor between mileposts 23 and 25 is in close proximity to one bearpoppy restoration area. However, this area is separated from the existing transmission road access by a steep ridge; thus, eliminating potential for impact to the bearpoppy restoration area.

The Proposed Action would create additional ground disturbance that could negatively impact the Las Vegas bearpoppy. Impacts involve loss of habitat and/or loss of individuals during construction, operation or maintenance of structures and roads. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance and limit new or improved access by the public.

Las Vegas buckwheat (Eriogonum corymbosum var. glutinosum)

No Las Vegas buckwheat was noted during 2002 surveys; however, the Proposed Action would traverse an estimated 14 miles of gypsum-based habitat and some known populations of Las Vegas bearpoppy.

Like the Las Vegas bearpoppy, avoidance is the preferred mitigation for Las Vegas buckwheat. Impacts involve loss of habitat and/or loss of individuals during construction, operation and maintenance activities. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance and limit new or improved access by the public.

Rosy two-toned penstemon (Penstemon bicolor ssp. roseus)

Although this species was not seen in 2002, previous surveys have located this plant within the plan area. Impacts involve loss of habitat and/or loss of individuals during construction, operation or maintenance activities. These activities would cause disturbance to ephemeral drainages throughout the project area, which are important habitat features associated with penstemon. However previous surveys identified only a small amount of habitat between mileposts 0-6, 22-23 and 38-39. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance, especially to drainage areas, and limit new or improved access by the public.

Yellow two-toned penstemon (Penstemon bicolor ssp. bicolor)

Like rosy two-toned penstemon, this species was not seen in 2002, but it has the potential to occur in the same areas as rosy two-toned penstemon. Impacts involve loss of habitat and/or loss of individuals during construction, operation or maintenance activities. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance and limit new or improved access by the public.

Threecorner Milkvetch (Astragalus geyeri var. triquetrus)

This species was not seen during 2002 surveys, possibly due to the dry conditions present during surveying. Only a small amount of habitat specific to this species has been identified within the plan area between mileposts 19 and 21. Other species that could also occur in this identified habitat include Nye milkvetch (*Astragalus nyensis*) and beaver dam breadroot (*Pediomelum castoreum*), neither of which was seen during 2002 surveys.

Impacts to these three species include potential loss of a small amount of habitat and/or loss of individuals during construction, operation and maintenance activities. Refer to Table 4-2 for proposed mitigation measures that would minimize ground disturbance and limit new or improved access by the public.

Cacti and Yucca

In Nevada, cacti and yucca (families Cactaceae and Agavaceae) are protected by Nevada Revised Statutes (NRS 527.060 - .120). There is a potential for cacti and yuccas to occur in the entire study corridor; however, density and species vary tremendously along the study corridor. Below the 2,300-foot contour, cacti and yucca numbers tend to decrease rapidly. In some areas, cacti and yuccas are an insignificant part of the flora.

Nevada Power would meander new roads and work areas where feasible to avoid cacti and yuccas. Salvage of cacti and yuccas would occur for portions of the Proposed Action where they were encountered in substantial numbers. Where found, minimal impact to the resource occurs if they are salvaged and relocated. Refer to Table 4-2 for proposed mitigation measures that would minimize impacts to cacti and yucca.

Noxious Weeds

All temporary surface disturbances associated with construction, operation and maintenance of the Proposed Action could lead to a new or increased invasion of exotic or noxious weed species. In areas where ground disturbance is substantial or where re-contouring is required, such as construction of new roads and structure foundations, aggressive non-native weed species could become established. Once established, aggressive weedy species can invade adjacent native habitats and degrade the condition of the surrounding area.

Due to the small amount of disturbance that would occur at each structure site, the risk of exotic species invasion is expected to be low. An increase in exotic species invasion could occur at select access road construction locations. However, the final Plan of Development would include mitigation measures to minimize impacts from these activities. Mitigation measures may also call for the closing of new access roads not permanently required to minimize public travel and further spread of noxious weeds.

Mitigation Measures for Botanical Resources

Where impacts to botanical resources were possible as a result of construction, operation or maintenance of the Proposed Action, mitigation measures were developed to reduce or eliminate these potential impacts. Individually, the mitigation measures address specific resources, but taken together they are a substantive approach to minimizing effects to botanical resources.

Locations of plants identified during this survey would be flagged for avoidance where feasible. The BLM and cooperating agencies would develop a restoration plan as part of the final Plan of Development identifying methods to be used during and after construction to minimize impacts to botanical resources. A transmission line project restoration plan would typically include the following requirements:

- Plants would be salvaged from work sites for replanting after construction
- Topsoil and rocks would be separated and stabilized during construction in temporary disturbance areas
- Work areas would be recontoured with soil & rocks replaced
- Plants may be transplanted back onto the disturbance areas
- The area may be reseeded
- In critical habitat, additional requirements such as seed collection, shrub propagation and/or live shrub plantings may also be required
- All areas would be monitored to ensure success criteria are achieved

Because of the acreage of gypsum soils crossed by the Proposed Action, impacts to some gypsum-endemic plants such as Las Vegas bearpoppy, sticky ringstem and Las Vegas buckwheat would be likely, despite management practices and mitigation measures to minimize impacts. As required, appropriate incidental take permits would be obtained from the Nevada Division of Forestry (NDF).

Table 4-2 Mitigation Measures for Botanical and Resources

Botanical-1	No construction of new roads or upgrading of existing access roads would occur in areas identified for or adjacent to Las Vegas bearpoppy restoration.
Botanical-2	Minimal construction of new roads or upgrading of existing access roads would occur in areas identified as sensitive plant habitat.
Botanical-3	In designated areas, sensitive plants and/or habitat would be flagged and structures would be placed to allow spanning of these features, where feasible within limits of standard structure design.
Botanical-4	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).
Botanical-5	Temporary disturbance would be restored using cacti and yucca originally salvaged from the site. The material would be salvaged by an experienced contractor, stockpiled in an area approved by BLM within the right-of-way, and then transplanted to reclaimed sites. BLM's protocols for proper maintenance of the material would be followed. Restoration would be in accordance with a BLM approved plan.

4.2.2 Wildlife Resources

Introduction

Potential impacts to wildlife associated with construction activities could include loss or displacement of individuals and/or habitat features.

Impacts to wildlife were analyzed by mile within a one-half-mile-wide study corridor. Refer to Appendix A, Map 2: Biological Resources, for location of the study corridor. Mitigation measures were applied to these impacts and a final determination of residual

impact was made. Ground disturbance information enabled a calculation of the total number of acres potentially disturbed for the Proposed Action. An estimated 165.5 acres of potential wildlife habitat would be permanently disturbed through the construction, operation and maintenance of the Proposed Action, while an additional 125.1 acres would be temporarily disturbed. Refer to Appendix D for a detailed impact assessment table.

A biological assessment was prepared to address impacts to FWS listed species potentially affected by the construction, operation or maintenance of the Proposed Action to include desert tortoise, bald eagle, Yuma clapper rail, southwestern willow flycatcher, yellow-billed cuckoo and relict leopard frog. FWS will render a biological opinion (BO) that would state whether FWS concurs with BLM determinations of effect to the species and whether implementing this action would jeopardize the continued existence of the species. Any stipulations identified by FWS with regard to these species would be followed as part of the Final Plan of Development.

Impacts to Wildlife Resources

Threatened and Endangered Species

Desert Tortoise

Construction of facilities would potentially result in degradation of desert tortoise habitat due to a reduction in cover and forage and increased levels of noise, traffic, equipment movement and human presence. Watering the road for dust abatement during construction activities could attract tortoises to the roads, increasing potential for them being injured or killed by vehicles. Additional impacts include habitat fragmentation and introduction of non-native plant species. The Proposed Action would result in an estimated 165.5 acres of permanent disturbance and 125.1 acres of temporary disturbance, all of which is considered potential desert tortoise habitat. However, much of this area is already disturbed by previous construction activities or public use.

Maintenance activities could affect desert tortoise during periodic access to the plan area for routine inspection, repairs, structure replacement and other activities. Individual tortoises could be injured or killed by equipment or vehicles during these activities and tortoise burrows could be disturbed. However, maintenance activities occur infrequently (usually twice per year), so impacts from these activities would likely be minimal.

Long-term impact from the presence of the transmission line could increase predation on young tortoises from raptors concurrently using the transmission structures and line as a perch or for nesting. The Proposed Action would largely be adjacent to existing transmission lines; therefore, these opportunities for perching and nesting already exist. As such, impacts from predation on young tortoise would not likely increase from current conditions.

Federal agencies have developed a relatively standard set of mitigation measures for desert tortoise in the Las Vegas area during pre-construction, construction and post-construction phases, as well as compensation for loss of habitat. These recommendations are summarized below:

- Education in desert tortoise protection measures for construction personnel

- Surveys to remove tortoises from construction zones immediately before construction
- Implementation of a litter control program
- Construction monitoring by qualified biologists
- Payment of mitigation fees for habitat compensation

Bald Eagle

No identifiable impacts to bald eagles occur because there is no nesting or hunting habitat for bald eagles in the plan area. Bald eagles wintering at Lake Mead, or eagles migrating through the area in the spring or fall, could fly over the area occasionally, but the project's effect on these visitors is expected to be minor.

Southwestern Willow Flycatcher

Impacts to the southwestern willow flycatcher could occur within the Las Vegas Wash area between mileposts 26 and 27 (SNEI, 2002). The riparian habitat in these sections is potential habitat for southwestern willow flycatcher due to the Wetland Restoration Project. Direct impacts would be limited to temporary disturbance as the lines are strung across the wash. No riparian plants would be removed as a result of project construction and no new roads would be constructed within the riparian vegetation area. Because wetland features within the Las Vegas Wash would be spanned, little or no impacts to potential southwestern willow flycatcher habitat would occur.

The active season for the willow flycatcher is May through September; any disturbance during this period in the Las Vegas Wash area could have impacts to nesting or foraging birds. No construction activities would occur in the wash during this time as mitigation for this species. Refer to Table 4-3 for proposed mitigation measures.

Long-term impact of the presence of the transmission line could increase predation from raptors concurrently using the transmission line as a perch. The Proposed Action would be adjacent to existing transmission lines crossing the wash; therefore, these opportunities for perching already exist. As such, impacts from predation would not likely increase with the additional transmission lines.

Yuma Clapper Rail

Impacts to Yuma clapper rail habitat could occur within the Las Vegas Wash area between mileposts 26 and 27 (SNEI, 2002). As with the southwestern willow flycatcher, the riparian habitat being improved as part of the Wetland Restoration Project could be important for the Yuma clapper rail. However, its presence there has not been documented (SNEI, 2002). As such, impacts to this species are expected to be limited to temporary disturbance of the riparian habitat during transmission line installation. Refer to Table 4-3 for proposed mitigation measures that would benefit the Yuma clapper rail.

Species of Special Concern

Reptiles

Impacts to the chuckwalla could occur throughout the plan area where rocky outcrops occur. Potential impacts to Gila monsters would be limited to the numerous washes in the plan area. Direct and short-term impacts to the chuckwalla and the Gila monster could include loss of individuals and habitat during construction, operation or maintenance activities. Compliance with state law regarding handling of Gila monsters encountered during construction would help reduce these impacts. Some of the habitat would once again be available following construction, however the loss of native vegetation could reduce the quality of the habitat.

As with desert tortoise and other prey species, impacts could include increased predation by raptors perching and nesting on the transmission structures. Given the large number of transmission lines that already exist in the plan area, predation is not likely to increase substantially. Another potential indirect impact would be loss of individuals from illegal collection due to the increased access into previously undisturbed areas. Closure of roads may be necessary in some areas to protect from increased access. Refer to Table 4-2, Botanical Resources for this measure and Table 4-3 for proposed mitigation measures specific to wildlife resources.

Amphibians

No identifiable impacts to amphibians such as the relict leopard frog or the arroyo southwestern toad occur in the plan area, because there are no known occurrences of and little potential habitat for either species.

Birds

Impacts to sensitive bird species could occur in the plan area, especially in the vicinity of the Las Vegas Wash between mileposts 26 and 27. As described for threatened and endangered bird species, the Wetland Restoration Project in this area hopes to provide increased riparian habitat beneficial to many species. Spanning these sensitive areas, limiting development of roads and restricting construction during key periods would be the best method of mitigating impacts to sensitive birds. Refer to Table 4-3 for a complete list of these proposed mitigation measures.

The presence of overhead electrical transmission lines greater than 69kV has been documented to have only a small effect on raptor and other bird populations due to death by collision or electrocution (Avian Power Line Interaction Committee, 1996). Electrocution is less of a problem with higher voltage lines due to the increased space between live phases. Climate factors such as heavy rain and fog also contribute to increased raptor collision with power lines; however, these conditions rarely occur in southern Nevada. Nevada Power has an existing program to monitor migratory bird mortality as a result of line collision or electrocution. Since 1992, reports of bird mortalities with recommendations for actions are submitted to FWS on an annual basis. No reports of migratory bird collision or electrocution have been reported on Nevada Power's existing 500kV lines. If that were to change, Nevada Power would work with FWS to determine appropriate mitigation.

Impacts to the ferruginous hawk include loss of a small amount of wintering habitat and temporary disturbance of a larger area of wintering habitat. However, because this species is known to visit the plan area only infrequently, impacts would be minimal.

Potential impacts to the western burrowing owl include loss of habitat and, since this is a ground-nesting bird, could include disturbance of breeding birds. Loss of individuals including young is possible if construction occurs during the breeding season. The FWS recommends that burrows or roosting sites not be disturbed and the construction of artificial burrows nearby when development activities destroy active burrows or roosting sites. Mitigation measures implemented for the desert tortoise would also reduce impacts to the western burrowing owl. Implementation of mitigation measures to survey prior to construction and avoid any identified nests would reduce potential impacts. Refer to Table 4-3 for a complete description of these proposed mitigation measures.

Potential impacts to migratory birds include disturbance of nesting and loss of habitat. Pre-construction surveys and avoidance of any identified nests with an appropriately sized buffer area as identified in Table 4-3, ensures compliance with the Migratory Bird Treat Act.

Desert Bighorn Sheep and Mule Deer

Impacts to mammals in the plan area could occur with loss of habitat and disturbance during construction. Mule deer and desert bighorn sheep in the southernmost parts of the plan area may be disturbed by construction noise that would cause them to avoid the plan area. An estimated 51.2 acres of permanent disturbance would occur within areas identified as potential bighorn sheep habitat. Another 35.8 acres would be temporarily disturbed. This habitat would be available following completion of construction. Long-term impacts could also result from disturbance during periodic maintenance activities; however these activities occur infrequently (usually twice per year).

Some increased public access would likely result from road construction or improvements in areas previously undisturbed. This could increase hunting pressure and harassment of wildlife, but with construction occurring mainly within existing utility corridors, access is not expected to increase considerably.

The presence of the transmission lines could make it more difficult for the Nevada Division of Wildlife (NDOW) to conduct aerial surveys to monitor the bighorn sheep population in the area. However, careful placement of the proposed route, with NDOW consultation to identify the location of these key areas, should minimize this impact.

Other Mammals

The potential impact this project may have on bats is loss of, or disturbance to, a small amount of foraging habitat. Their nocturnal habits would mean that they are unlikely to be encountered during construction. Following construction, most of the habitat would once again be available to them. The presence of the transmission lines could lead to an increased risk of collision, but this impact is expected to be minor. The Nevada Bat Working Group lists the key human-induced threats facing bats in Nevada and none of these threats are related to collision with manmade structures (Altenbach et al., 2002).

Mitigation Measures for Wildlife Resources

Where impacts to wildlife were possible as a result of construction, operation or maintenance of the Proposed Action, mitigation measures were developed to reduce or eliminate these potential impacts (Table 4-3). In addition, measure No. 4, as provided in Table 4-3 Mitigation for Botanical Resources, to close unnecessary roads, would be beneficial to wildlife as well as botanical resources.

Table 4-3 Mitigation Measures For Wildlife Resources

Wildlife-1	Proposed mitigation measures were developed based on terms and conditions of other BLM biological opinions for the desert tortoise. Terms and conditions of the biological opinion rendered through formal consultation with the FWS would be implemented during all project related activities. These mitigation measures may include at a minimum: Education in desert tortoise protection measures for construction personnel; Surveys to remove tortoises from construction zones immediately before construction; Implementation of a litter control program; Construction monitoring by qualified biologist; Habitat compensation within the Las Vegas District of the BLM
Wildlife-2	In designated areas, structures would be placed to avoid sensitive wildlife and/or to allow conductors to clearly span the features, within limits of standard structure design.
Wildlife-3	If construction of the project is not begun until after the commencement of burrowing owl breeding season (mid March – August), all burrows, holes, crevices, or other cavities on the construction site would be collapsed after a qualified biologist thoroughly checks them for inhabitants. This would discourage owls from breeding on the construction site. If authorization for the plan is not provided until after the commencement of breeding season and burrowing owls can be seen within the area during surveys, behavioral observations would be done by a qualified biologist to determine their breeding status. If breeding behavior is observed, an area large enough to prevent disturbance to the adults (as determined by BLM) would be avoided until the chicks fledge to ensure the chicks do not abandon the nest.
Wildlife-4	In compliance with Nevada Administrative Codes regarding protection of the gila monster, standard NDOW protocols would be followed if a gila monster is encountered during construction activities.
Wildlife-5	Restrict construction activities in the Las Vegas Wash (milepost 26-28) from May-September to avoid active period for sensitive riparian bird species that could potentially occur in this area.
Wildlife-6	Outside of riparian areas, if construction must occur during the breeding season of migratory birds (March 15th - July 30th), the plan area would be surveyed for nests prior to implementation. If a migratory bird nest were found with nestlings present, the area would be avoided until birds fledge. Executive Order 13186 issued January 11, 2001 defines the responsibilities of the Federal Agencies to protect migratory birds; the Migratory Bird Treaty Act of 1918 and subsequent amendments (16 U.S.C. 703-711) state that it is unlawful to take, kill, or possess migratory birds. A list of those protected birds are in 50 C.F.R. 10.13.

4.2.3 Air Quality and Meteorology

Introduction

The construction of the Proposed Action would produce two types of air contaminants: exhaust emissions from construction equipment and fugitive dust generated because of soil movement. Pollution emissions that occur during construction are generally exempt from Prevention of Significant Deterioration (PSD) review because the PSD requirements are primarily for major stationary sources and specifically exempt temporary increases in these emissions.

Air Quality Impacts

Emissions

Construction impacts may be expected during each phase of transmission line installation. Emissions produced during grading and construction activities are of short-term duration and would cease upon completion of project construction. Exhaust emissions from construction equipment include those produced onsite as the construction equipment is used.

The anticipated emissions of CO and PM₁₀ pollutants associated with the Proposed Action were calculated based on construction equipment identified in Chapter 2 for the Proposed Action. Emissions from construction would be confined to daytime activity for the duration of the construction period.

The Proposed Action is a linear non-major source and does not violate any of the Net Emissions Increases of criteria pollutants. The calculated values for CO emissions due to projected vehicular construction traffic are expected to be approximately 30 tons per year (TPY), much less than the NAAQS requirement of 70 TPY for CO from non-major source non-attainment areas.

Fugitive Dust

Construction activities are a source of fugitive dust emissions that may have an effect on local air quality. Emissions are associated with land clearing, ground excavation, grading operations and construction of the structures. Road construction is the prevalent construction category with the highest emission potential. The cut and fill requirements for new and improved access roads would contribute to fugitive dust emissions.

Dust emissions vary substantially from day to day, depending on the level of activity, the specific operations and the prevailing weather. A large portion of the emissions would result from equipment traffic over unpaved roads to the structure sites. Total suspended particle concentrations of 1.2 tons of fugitive dust per acre of disturbance per month of grading activity for the project may be expected. Approximately 192 acres within the plan area may be subject to grading. This figure is based on the number of staging areas and structures estimated for the entire 48-mile transmission line corridor within the 200-foot transmission line right-of-way. Assuming an estimated one-year development period, with approximately 16 acres of soil disturbed monthly in the affected right-of-way, 50.74 tons of fugitive dust per year would be generated.

Application of fugitive dust control measures required by the Clark County Department of Air Quality Management (DAQM) permit for construction activities would (by rule) effectively reduce emissions by 80 percent, to approximately 10 tons of PM per year. This figure is below the 15 TPY of PM₁₀ general requirements for non-major sources as per the DAQM Section 12 (5/24/01). The following dust control measures must be applied singularly or in combination to maintain dust control on all disturbed soil and minimize particulate emissions:

- Soil must be maintained in a sufficiently damp condition to prevent visible fugitive dust emissions that exceed 20 percent opacity as set forth in Section 94.9

(CCHD rules), or prevent any dust plume from extending more than 100 yards, horizontally or vertically, from the point of origin

- The soil must be crusted over by water or other appropriate methods, as demonstrated by the drop ball/steel ball test
- The soil must be covered with clean gravel or treated with a dust suppressant

Mitigation Measures

Controls would be necessary to minimize potential particulate impacts from construction activities. As identified in Chapter 2, Table 2-3, management practices for dust control (e.g., watering and/or chemical stabilization) would be utilized. Management practices would effectively control dust to Clark County required levels for non-major sources.

4.2.4 Visual Resources

Introduction

Visual resource impacts that would result from the construction, operation and maintenance of the Proposed Action have been identified as they relate to sensitive viewpoints and from the effects to the aesthetic values of the landscape.

This analysis considers the potential visual impacts from the Proposed Action resulting in the following changes to the landscape:

- Views from planned or existing residences
- Views from planned or existing parks, recreation and preservation area viewpoints
- Views from travel routes
- Visual integrity of natural and developed areas

The visual impact assessment for the Proposed Action is based on the guidelines in the BLM's Visual Resource Management (VRM) 8400 Series (BLM, 1984) and previous transmission line impact assessment methods that have been completed for similar areas.

To assist in determining visual impacts, the guidelines below were used to evaluate whether the Proposed Action would cause:

- Substantial adverse effect on a scenic vista
- Damage to scenic resources, including, but not limited to, trees and rock outcroppings
- Substantial degradation to the existing visual character or quality of the site and its surroundings
- Creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area

In applying these guidelines to determine a level of impact, a variety of factors were taken into account including: (a) the extent of Proposed Action visibility from parks,

residential areas and recreation destination routes; (b) the degree to which various Proposed Action elements would contrast with or be integrated into the existing landscape; (c) the extent of change in the landscape’s composition and character; (d) the number and sensitivity of viewers.

Photo Simulations

Areas identified through scoping as having a high concern or importance for visual resources were further evaluated using photographic simulation techniques. These views are referred to as Key Observation Points (KOPs). Simulations were used to evaluate the accuracy of the predicted visual impacts, to determine the effectiveness of recommended mitigation and to illustrate the expected impacts to the concerned agencies and the public. The photo simulations can be found in Appendix B, KOPs 1 through 9.

Impact Assessment Results

During construction, short-term visual impacts would result from the presence of equipment, materials and work crews. Although these impacts are short term, they would be noticeable to local residents.

As the route would depart from the Harry Allen Substation, sensitive viewers would see the Proposed Action from viewpoints along Interstate Highway 15 (I-15), U.S. Highway 93 and the assumed location of the Spanish Trail/Mormon Road. Visual impacts would result where the Proposed Action would have weak visual contrast along mileposts 0 to 2.6. Additional visual impacts would occur from mileposts 2.6 to 6.1, where strong visual contrasts would occur in all distance zones from both moderate and high sensitivity viewpoints. Visual contrast would also alter Class C (described in Chapter 3) scenic quality along these same mileposts resulting in a visual impact. See the Visual Impact Data Table located in Appendix D.

In areas where the Proposed Action would not parallel other transmission structures, visual contrast would be strong. This condition exists between milepost 2.6 heading southeast to milepost 6.1 and also between mileposts 39 and 40 heading south.

The Proposed Action would use steel lattice structures throughout the plan area to reduce visibility of the Proposed Action in the foothill and occasional mountainous landscape found along the proposed route. Lattice structures are typically less visible than steel single-pole structures when viewpoints are located further than one mile from the proposed route and foothills and/or rolling hills form a backdrop behind the structures.

Dispersed recreationists within the Muddy Mountains Wilderness would see middle ground and background views of the transmission line. These viewers would see the transmission line in the vicinity of mileposts 12 and 13 where the Proposed Action would be more than 2.5 miles away from the nearest western edge of the wilderness boundary. Combining the moderate sensitivity of dispersed recreation viewpoints, weak visual contrast and the middle ground and background views of the Proposed Action area, a visual impact would occur along mileposts 12 and 13. These initial impacts would be minimal with the use of steel lattice towers, which weather over time to reduce light reflection or glare from the metal surface of the towers.

Foreground views of the transmission line would occur from residences and golf course recreation areas on the Lake Las Vegas Resort from mileposts 25.5 to 27.5 along the proposed route. Foreground views would also occur from residences located near the proposed route from mileposts 28 to 30. Both the residences and the viewers at the golf course have a high sensitivity to change in their visual environment. These initial impacts would be minimal with the use of steel lattice towers, which weather over time to reduce light reflection or glare from the metal surface of the towers.

Scenic quality of the landscapes found along the proposed route near mileposts 25.5 to 30 is both Class A and C. Residual impacts to scenic quality would be minimal in areas where two large existing lattice structure 500kV transmission lines parallel the Proposed Action in the Rainbow Gardens vicinity.

BLM Visual Resource Management Classes and Objectives

Of the nine KOPs, two occur on BLM land. KOPs No. 1 and 5 are located on VRM class III land. All other KOPs are located on non-BLM land. This condition reflects the actual distribution of viewers that occur in the Las Vegas Valley. Developed recreation sites, residential homes and motorists traveling highways were considered the viewers most sensitive to change nearest the Proposed Action. Of these viewer types, only motorists traveling I-15 would see the Proposed Action where Visual Resource Management policies exist.

As identified in the Las Vegas Resource Management Plan (RMP), Objective VS-1 is to “Limit future impacts on the visual and aesthetic character of the public lands.” Also, the RMP directs (VS-1b) that areas identified as Class III (RMP Map 2-9) be managed for partial retention of the existing character of the landscape. In these areas, authorized actions may alter the existing landscape, but not to the extent that they attract or focus attention of the casual viewer. The RMP also directs (VS-1c) that areas identified as Class IV (RMP Map 2-9) be managed to allow activities involving major modification of the landscape’s character. Authorized actions may create significant landscape alterations and would be obvious to casual viewers.

The results from KOP No. 1 indicate the characteristic landscape would be altered because of the proposed action. This alteration, however, is not an introduced form or line not already seen throughout the characteristic landscape. A casual viewer’s attention is already drawn and focused to multiple 230kV and 345kV corridor nearby. The proposed action would not be a new element introduced that would be out of context with the surrounding visual condition. Hence, the Proposed Action meets the RMP objectives and management direction at KOP No. 1’s location.

The results from KOP No. 5 also indicate that the characteristic landscape would be altered as a result of the proposed action. The simulation shows the effectiveness of lattice tower placement in front of complex topography nearby. The topography behind the lattice towers forms a backdrop that makes the structures less visible. A casual viewer’s attention is already drawn and focused to multiple 230kV and 345kV corridors nearby. The proposed action would not be a new element introduced that would be out of context with the surrounding visual condition. Hence, the Proposed Action meets the RMP objectives and management direction at KOP No. 5’s location as well.

The RMP objectives and management direction would also be met where the Proposed Action would cross VRM class IV lands. This is due to management that allows activities involving major modification of the landscape’s existing character. Authorized actions may create significant landscape alterations and would be obvious to casual viewers. Essentially, the goals for VRM class IV lands are more tolerant of visual impacts. Since the impacts levels are low enough to not violate VRM class III objectives, class IV objectives would also be met.

As for the overall objective of VS-1 in the RMP, the Proposed Action would limit future impacts on the visual and aesthetic character of the public lands because the visual impacts would be concentrated to one substantial, existing utility corridor. Additionally, visual impacts wouldn’t extend into other areas that are devoid of visual impacts.

Mitigation Measures

Mitigation measures would be effective in reducing visual impacts along visually sensitive portions of proposed route in areas where the Proposed Action would be located greater than ¼ mile from the viewer. In areas where the transmission line would be visible from distances less than ¼ mile, the Proposed Action would be dominant and would potentially result in long-term visual impact (i.e., for the life of the Proposed Action).

Potential initial visual impacts would be effectively reduced through implementation of the proposed management practices. For a complete list of proposed management practices refer to Table 2-3 in Chapter 2.

The recommended mitigation to further reduce the impact of the Proposed Action on visual resources includes the following measures as shown in Table 4-4. The locations of mitigation measure recommendations are listed in the Visual Impact Data Table in Appendix D.

Table 4-4 Selectively Recommended Mitigation Measures For Visual Resources

Visual-1	Temporary disturbance would be restored using cacti and yucca originally salvaged from the site. The material would be salvaged by an experienced contractor, stockpiled in an area approved by BLM within the right-of-way and then transplanted to the reclaimed site. BLM’s protocols for proper maintenance of the material would be followed. Restoration would be in accordance with a BLM approved plan.
Visual-2	Dulled finish structures would be used to reduce visual impacts. Single pole structures would be painted a medium gray with the following specifications: Carboline primer, number 621, polyurethane zinc, Aliphatic polyurethane, color number 0729, medium gray.
Visual-3	Minimal widening or upgrading of existing access roads would be undertaken in the area. This would minimize ground disturbance and limit new or improved access ability. This measure can also be applied to limit the disturbance at tower sites and staging areas.
Visual-4	All new access roads not required for maintenance would be permanently closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner (e.g., stockpiling and replacing topsoil, or rock replacement). This would limit new or improved accessibility in the area.

4.2.5 Cultural and Ethnographic Resources

Introduction

Construction and installation of the transmission line would result in surface disturbance from pole emplacements, pole relocations, borings, new push-road construction, improving existing but currently unmaintained access roads, lay-down or pulling-and-tensioning stations and other attendant facilities and activities. Archaeological properties are fragile and non-renewable resources; as such, construction activities on or near significant sites may affect them.

Impacts to Cultural Resources

Preliminary project plans indicate that 12 of 19 prehistoric and the five historic-period significant properties would be affected and would require some form of mitigation or treatment. Six prehistoric properties may be successfully avoided through project redesign or access road restrictions. Effects would be limited to a non-sensitive portion of one prehistoric property. These sites are summarized in the cultural resources impact table in Appendix D.

Potentially affected prehistoric sites include four of the five Complex Features/Artifact Assemblage Sites identified in the study corridor and eight of the 10 Complex Feature/Artifact Assemblage Fragile Pattern sites. Potentially affected historic-era properties include both of the Hoover Dam-related squatter campsites and segments of three separate railroads.

Mitigation Measures

An Historic Properties Treatment Plan would be developed and subject to review as defined in the Programmatic Agreement between BLM, Western, USBR, Nevada Power Company and the Nevada SHPO. That plan would describe the specific impacts that each property would sustain and the mitigation measures appropriate for each affected property. As general guidance, for prehistoric sites significant for their data potential (NRHP Criterion D), the goal of data recovery would be to realize the National Register-value of each of the historic properties through a combination of (a) field investigations to recover a sample of archaeological materials from the deposit at each property; (b) field investigations that document the structure and determine the nature of the features present at the properties; (c) archival research; and (d) analysis of pre-existing collections and records from the properties.

Mitigation measures for Gypsum Cave (NRHP eligible under criteria A, B and D) would include analysis of the 1930s collection housed at the Southwest Museum, a public education/outreach program and nomination of this property to the NRHP. In addition, consultation with Tribes would continue, so that additional information may be gained concerning this cave's traditional significance. Elders' perspectives and observations concerning the existing collection at the Southwest Museum is a necessary component of the analysis. A contemporary excavation would receive consideration, given the advances in geomorphological analyses, dating techniques and artifactual recovery techniques that have developed since 1930.

Regarding the historic-era properties, the historic context and treatment plan developed by Furnis (2003) for depression-era, Hoover Dam-related squatters camps would serve to guide investigations at the two potentially affected properties of this type. In designing mitigation measures for the three significant railroads that would potentially be affected, a public education/outreach program would be considered. This measure is in addition to historical research and detailed recordation/documentation of specific engineered structures and features that would be affected; the degree to which these linear historical properties are physically altered or impacted by the proposed project would dictate the amount and focus of the mitigative effort, adhering to guidelines provided in Appendix H of the State Protocol Agreement between BLM and the Nevada SHPO.

Consultations with tribal representatives and Elders provided a range of possible mitigative alternatives for the preservation and long-term management of Gypsum Cave. Key aspects include: continued consultations with Tribes, nomination of Gypsum Cave to the NRHP; a preservation plan under the BLM Las Vegas Field Office’s Resource Management Plan that is informed by tribal perspectives regarding this property; limiting access to the site through road closures; installing a bat grate that both protects the bats that live in the recessed chambers of the cave and blocks human entrance into these chambers; and educating the public about this location’s importance to Native American peoples and its value as an important archaeological and paleontological site. These alternatives would continue to receive consideration during on-going Native American consultations. Specific measures that would be implemented would be restated in the Historic Property Treatment Plan.

4.3 Additional Resources Assessed

4.3.1 Land Use

Introduction

The impact assessment corridor is based on the proposed 200 foot-wide transmission line right-of-way (100 feet either side of the assumed centerline). Maps identifying land jurisdiction and land use are included in Appendix A.

Potential impacts to land uses were assessed along the assumed centerline of the Proposed Action for the inventoried land use categories described below. The impact types identified for the land uses along the centerline of the proposed route are characteristically direct and long-term and include any impact that affects the following:

- Existing, developing or planned land use or activity
- Applicable general and regional plans and/or approved, adopted or officially stated policies, goals or operations of communities or governmental agencies
- Existing or planned air facility or air travel-related activity
- Established, designated or planned park, recreation, preservation or educational use area or activity

The impact data tables show the milepost location of potential impacts, the access level (ground disturbance level), the land use feature, the recommended mitigation measure(s) and the residual impacts.

Impact Assessment Results

Existing Land Use

The majority of potential impacts to existing land uses would result from the proposed transmission line's direct physical effect on existing land use. Indirect impacts on existing land uses could also occur after construction of the transmission line. For example, construction of new buildings or additions to existing structures could be precluded by the right-of-way to avoid conflicts with the transmission line maintenance activities and to ensure safety.

Construction activities would involve the crossing of various roadways. Generally, spanning the travel route and using traffic and safety controls during construction (e.g., flagmen, guard structures) would create only minimal traffic delays at these crossings. Appropriate agreements or permits would be acquired from the administering agency for the crossing of road rights-of-way.

The potential effects of the Proposed Action upon public use airports would require notification and a hazard determination with the Federal Aviation Administration (FAA). As a part of the Proposed Action, Nevada Power would file a Notice of Proposed Construction or Alteration form with the FAA (FAA Form 7460-1). Nevada Power would install high-visibility devices where required by the FAA. Nevada Power would also contact the owner/operator of private airports and airstrips potentially affected by the Proposed Action.

Active mining claims were identified within the plan area and would be crossed by the Proposed Action. However, the construction of the proposed transmission line would have no identifiable impact on mining claims.

Planned Land Use

Residual impacts would occur for a total of 1.8 miles from the proposed route crossing planned areas associated with the following features: Lake Las Vegas Resort and Clark County Regional Flood Control District Flood Control Facility (N.E. C-1 Detention Basin).

Parks, Recreation and Preservation Areas

Recreation use, including off-highway vehicles, would be displaced from the lands occupied by the Proposed Action. Generally, impacts to the recreation experience result in minor impacts to the scenic or aesthetic qualities of the surrounding landscape (refer to Visual Resources, Section 4.2.4).

Legislative action allows Nevada Power to cross the BLM Sunrise Mountain Instant Study Area within a defined corridor (refer to Chapter 3 – Land Use for details regarding this corridor). Unfortunately, existing access roads, which could be used to minimize the need for new access roads, are located outside the designated 500-foot utility corridor;

therefore, a new access road would be required. Boundaries of this area would be surveyed and/or verified to ensure proper placement of project facilities. Boundaries of the proposed construction activities would be clearly marked with flagging, exclusion fence, signage or other distinctive markings to avoid construction crews straying onto adjacent areas during construction.

Potential impacts to BLM-managed Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs) are not anticipated. Although construction of the proposed 500kV transmission line would require coordination with any scheduled activities, use of the area would not be curtailed.

Residual impacts would occur from the Proposed Action crossing the following land use features:

- Old Spanish National Historic Trail
- BLM Rainbow Gardens ACEC
- BLM River Mountains ACEC
- BLM Sunrise Mountain Natural Area
- Clark County Potential Trail Alignment
- UNLV Rainbow Gardens Geologic Preserve
- Clark County Wetlands Park
- Proposed Clark County Wetlands Park Trail Corridor
- City of Henderson Proposed Bike Lane
- City of Henderson Proposed Shared-Use Trail
- City of Henderson Proposed Park (Park A)
- City of Henderson Proposed Bike Route
- Rivers Mountains Loop Trail
- Clark County Proposed New Candidate Trail Corridor

Mitigation Measures

Management Practices proposed as part of the Proposed Action were developed with the intention of minimizing potential impacts to land use. Refer to Chapter 2, Table 2-3 for a list of these practices.

Mitigation measures identified for biological and visual impacts could be applied to further minimize potential land use impacts resulting from the construction, operation and maintenance of the Proposed Action (refer to Table 4-2, 4-3 and 4-4). Two of these measures were designed to minimize the effects of new access roads by requiring that existing access be utilized wherever possible and by closing new access roads where feasible.

4.3.2 Socioeconomics

Introduction

The study corridor for the Proposed Action is largely in undeveloped rural areas; however, construction activities would cause periods of disturbance and the line would introduce a new facility to the area. Construction of the transmission line would have transitory effects on people living near the right-of-way. The following is a discussion of the effect of the alternative routes on the communities along the corridor, describing their potential for affecting the social and economic welfare of the area's residents.

Impact Assessment Results

Population Effects

The figure of merit for assessing the construction phase's socioeconomic impacts is population. Population was delineated in terms of the census tracts as part of the Chapter 3 inventories through or along which the Proposed Action is located. The total population for the plan area in 2000 was 30,756 and the total number of housing units was 12,811.

None of the census tracts (CT) in the plan area have a majority of their residents represented by minority groups. Whites comprise the majority race, ranging upwards of 93 percent (near Henderson and Boulder City) to a low of about 53 percent in CT 59.02 at the northern end of the proposed route. The population of this tract, which totaled about 1,500 persons in 2000, is widely dispersed, with Hispanic/Latinos and Native Americans accounting for most of the minority group population in the tract. CT 59.02 is vast, extending across the entire northern side of the metropolitan area; it includes both the Moapa River Indian Reservation at the eastern end of the tract and the Las Vegas Paiute Indian Reservation at the western end.

Environmental Justice

The criteria for a finding of possible environmental justice problems is the occurrence in the area of influence of the Proposed Action of more than 50 percent of the population being minority or low-income. The Proposed Action was evaluated and there were no occurrences of disproportionately high percentages of minority or low-income populations who might be impacted.

Economic Effects

The Las Vegas area's population and economy is large, diverse and dynamic; therefore, the economic effects of constructing the transmission line would have little discernable effect on the overall levels of personal income and employment in the region. The construction phase would likely employ between 100 and 140 workers over the course of 1.0 to 1.4 years. Their aggregate gross wages are estimated to be nearly \$7 million.¹

¹ Manpower estimate based on *The Plan of Development for the Harry Allen – Northwest 500kV Transmission Line* (Power Engineers, 2001), scaled to the length of the preferred alternative alignment for the HA-Mead line (approximately 50 miles versus 36 for the HA-NW project). Wages

The latest available data for total personal income in Clark County is for 1999, amounting to \$37.3 billion. At current growth rates, the figure for 2002 would exceed \$42 billion.² Accordingly, the Proposed Action would make a relatively small contribution to the overall economy of the region. More substantial, in the longer term, would be the benefits of maintaining reliable electric power service to the residents and industries of the region in the face of its ever-growing demand.

Apart from the benefits of reliable service to customers in general, benefits would also accrue to jurisdictions along the route in the form of property taxes. However, lacking estimates of capital costs, it is not possible to estimate assessed values or property taxes for the Proposed Action. Payments would also be made to Federal jurisdictions providing right-of-way easements.

Some positive effects would also come during construction, not only in the form of direct employment, but also from procurements of construction materials and services from local suppliers and businesses.³

Mitigation Measures

Proposed management practices (Chapter 2, Table 2-3) to avoid or reduce environmental impacts and protect public safety along the selected right-of-way would greatly reduce any disturbance to daily living patterns occasioned by construction activities. Mitigation measures proposed for these resources would also minimize impacts to the public. As such, no additional socioeconomic mitigation for the Proposed Action is recommended.

4.3.3 Health and Safety

Introduction

This section describes the types of impacts that would likely occur to public safety due to hazardous materials and electrical effects associated with the Proposed Action.

estimate by Power Engineers based on average wage of \$25 per hour x 2,080 hours per year x 100-person fulltime equivalent workforce for 1.4 years (50 miles/36 miles x 1.0 years). Wage rate based on range of wages reported for electrical workers, operating engineers and helpers in Clark County (Nevada Labor Commissioner, 2001)

² Estimate based on a 6 percent average annual growth rate.

³ Estimates of construction costs have not been released by the Nevada Power, so it is impossible to estimate the value of local procurements. The figure would likely run into several millions of dollars, however, and would support secondary employment in the wholesale, retail and service sectors of the local economy.

Impact Assessment Results

Electrical and Magnetic Fields

Induction

As explained in Chapter 3, a large conducting object that is well insulated from the ground might present an opportunity for a perceptible shock if it is in a strong enough electric field. Structures near the 500kV line may be quite large, e.g., barns and large storage buildings. Since electrical induction effects generally increase with the size of the object, there could be perceptible currents or sparks caused by the Proposed Action interacting with these structures. However, such objects are often naturally grounded, which would considerably reduce the magnitude of currents or sparks that a person can receive due to electric field induction. A person is also reasonably well grounded if standing on grass or dirt, particularly if the earth is damp and the person is wearing leather-soled shoes. However, a person can receive a shock within the right-of-way, which although not hazardous, could still be annoying or startling.

Buildings and storage sheds would not be permitted within a right-of-way, so induction should not be an issue.

Fires

The proximity of the 500kV transmission line to conductive and/or combustible objects in or near the right-of-way could result in a risk of fire because of one of the following effects:

- A direct current flashover from the conductor to the object if the object is less than a minimum clearance, causing an electric arc between the line and the object
- A spark discharge on the object because of an increase in voltage between the object and ground

Air has a very high electrical insulation value (capable of sustaining up to 30,000 volts per centimeter) which aids in reducing the susceptibility of an arc discharge occurring. It has been determined that to cause wood (such as a tree) to burn, the wood object must be less than 10 feet from the line. Given the lack of tall natural objects in the plan area, this type of fire risk would not be a safety impact.

There is, however, a risk of wildfire from construction equipment or a possibility of a live line or conductor falling to the ground igniting a wildfire. Workers would be instructed not to drive or park vehicles where catalytic converters can ignite dry vegetation. Vehicles would carry water and shovels or fire extinguishers during times of high fire hazards. Fire protective mats or shields shall be used during grinding or welding. Workers would be instructed to exhibit care when smoking in natural areas. Fueling of a vehicle would take place outside of the 500kV transmission line right-of-way.

EMF Impacts

Recent studies have concluded that magnetic fields do not themselves have the energy to directly cause cellular DNA damage that lead to leukemia or other cancers (Lloyd 2003).

However, in light of some uncertainty, Nevada Power designs and constructs their circuits to reduce EMF to the maximum extent feasible.

Hazardous Materials

The presence of hazardous materials or hazardous wastes within the study corridor only becomes an issue when either (a) these substances are improperly stored or handled or (b) these substances are encountered when excavated during construction resulting in inadvertent releases to the environment (e.g., spills, leaking tanks, disposal to the ground or water).

All construction, operation and maintenance activities would comply with all applicable Federal, state and local laws and regulations regarding the use of hazardous substances. The construction or maintenance crew foreman would be responsible for maintaining compliance with all applicable laws and regulations. In addition, an onsite inspector would be present during construction to make sure all hazardous materials are used and stored properly. A handling plan would be developed as part of the Plan of Development during the engineering and pre-construction phase of the transmission line.

Mitigation Measures

The sensitive receptors in terms of hazardous materials and electrical effects are residential areas, schools, commercial properties, industrial buildings and construction workers in proximity to the line. Management practices proposed in Chapter 2 to improve safety and minimize environmental impacts (Table 2-3) would be implemented to reduce potential impacts associated with hazardous materials and EMF.

4.3.4 Water Resources

Introduction

This section describes the types of impacts to water resources that would potentially occur from construction, operation and maintenance of the Proposed Action. Water resources considered include surface waters (perennial and intermittent waterways), wetlands and floodplains. These resources were inventoried and are described in detail in Chapter 3.

In assessing the potential impacts to water resources that would result from the Proposed Action, the following factors and potential effects were considered:

- Proximity of Proposed Action relative to sensitive water features
- Level of ground disturbance for Proposed Action (as described in Section 4.1)
- Surface water discharges that would impair the beneficial uses of surface water adjacent to the Proposed Action as set forth in the Nevada Administrative Code Chapter 445.1350, 445.1352, 445.1354 and 445.1356
- Development within the 100-year floodplain (Executive Order 11988)

- Substantial alteration of floodwater flow resulting from onsite flooding substantially different from the existing 100-year flood standard (Executive Order 11988)
- Generation of onsite runoff that exceeds the capacity of existing storm drain systems

The results of the impact assessment and mitigation planning process are discussed in the following paragraphs and are summarized in the water resources impact data table in Appendix D. The impact data table shows, by mile location of potential impacts, the ground disturbance level, the water resource feature, the initial impact level, the recommended mitigation measure(s) and the residual impact level.

Impact Assessment Results

Short-term impacts are generally the result of construction activities. Construction activities in proximity to any waterway may impact natural channel flow, specifically discharge and morphology. Spills of petroleum products, solvents or other construction-related materials near a water resource feature could impact water quality. The movement of soil, and the exposure of soil to rain and surface runoff would increase the erosion potential and cause increased sedimentation.

Overhead transmission line construction requires excavation, scraping and grading and soil stockpiling. The overhead transmission line and access roads would cross one perennial and numerous intermittent waterways. Surface water quality could be diminished because of (1) access road and foundation excavation near sensitive water resources; (2) vehicular traffic, scraping and grading and material laydown at pull sites/laydown areas; and (3) scraping and grading, construction of culverts in waterways and construction of new permanent access roads. If sediment-laden runoff enters nearby drainages, it could potentially increase turbidity, increase channel siltation and reduce the flood-carrying capacity of downstream waterways. Direct water quality impacts from soil erosion downstream sedimentation would be minimized or eliminated by the implementation of a stormwater pollution prevention plan (SWPPP). Any residual impacts would be short term and would cease when construction activities are completed and the site is stabilized.

At each lattice tower site, four concrete foundations approximately three feet in diameter and up to 28 feet deep would be constructed. Placing impervious material would restrict stormwater infiltration rates. However, this impact would be negligible for either the lattice tower foundation or the steel pole, because the total area along the transmission line route impacted by foundations of either structure amounts to less than 0.1 acre.

The proposed route crosses approximately 1.8 miles of FEMA-defined 100-year floodplains at six separate locations (Appendix A, Map 3: Biological Resources). An effort would be made to avoid placing any structures within the 100-year floodplains. Final structure locations would not be known until final design is completed. Only one floodplain location at milepost 32 is wide enough to pose a problem for spanning. If placement of structures within the floodplain cannot be avoided, structures would be reinforced and engineered to withstand flood events. No changes would occur to the drainage patterns of the floodplains crossed.

There is a possibility that some relatively minor drainage diversions would be created due to the grading for the Proposed Action. These minor drainage diversions would be evaluated as part of the final engineering design and constructed such that drainage facilities are adequate to handle increased flows.

Long-term impacts would generally be associated with the operation and maintenance of the Proposed Action. Long-term impacts to surface water quality would persist due to the use and maintenance of access roads and resultant soil erosion potential; however, given the infrequency of maintenance activities (twice annually), these impacts to water resources would be minimal to not identifiable.

A total of 10.3 miles of floodplains and ephemeral drainages are crossed. An estimated 49.8 acres of permanent ground disturbance would result and 30.4 acres of temporary disturbance. Most of this acreage is due to the vast network of small ephemeral drainages crisscrossing many parts of the study area. Most of these drainages, with the exception of those immediately adjacent to the Las Vegas Wash, do not have a continuous surface connection with a Waters of the US designated waterway. The potential short-term impacts to water resources identified for proposed construction activities include the following:

- Accelerated soil erosion and sedimentation with impacts to perennial water sources limited to construction sites immediately adjacent to the Las Vegas Wash.
- Localized alterations to runoff characteristics and drainage patterns
- Surface water and groundwater quality degradation, if there were an accidental release of gasoline or oil from vehicles and equipment

Mitigation Measures

The construction and operation of the Proposed Action would require very little consumptive use of water resources and thus no impacts to water quantity are anticipated. Furthermore, all potential impacts to water resources identified in this assessment would be minimal with the implementation of management practices identified as part of the Proposed Action in Chapter 2, Table 2-3. Management Practices that are anticipated to lessen impacts to water resources are summarized below:

- Restriction of movement outside the right-of-way
- Preservation of original contours and vegetation where possible
- Reseeding and installing erosion control devices
- Construction of roads at right angles to washes and installation of culverts where necessary
- Proper storage, use and disposal of waste including hazardous and potentially hazardous materials
- Dust control

It was determined that these management practices, in conjunction with a site-specific SWPPP, would be sufficient to eliminate or minimize impacts to water resources.

4.3.5 Geology and Soils

Introduction

In general, impacts to geology and soils from various development projects or earth moving activities could include any of the following:

- Damage to geologic sites of major public interest
- Excessive sedimentation or erosion
- Destruction of potential mineral, geothermal or oil and gas resources
- Disfigurement of the natural landscape
- Alteration of natural drainage features

Impacts from construction of transmission lines would primarily be related to right-of-way clearing, road building or road improvements, installation of structures and conductor stringing operations. The predominant impacts from such activities would include localized increases in erosion, disfigurement of the natural landscape from bench roads located along hillsides, or restricted or removal of access to mineral resources.

Impact Assessment Results

Geology

Several sections of the alternative routes are located in rugged mountainous terrain with slopes ranging from 15 percent to more than 30 percent and a few places with slopes exceeding 30 percent. Access to tower sites in these regions would be achieved by using existing bench roads where available or constructing new bench roads along the slopes and clearing areas for the transmission towers. Impacts to geologic features in these areas would include permanent scarring of the hillside and an increase in slough loading below the bench roads.

These impacts would most likely occur at locations along the Proposed Action within the steep areas where existing access roads are not adequate and new roads would be necessary.

Mineral development is ongoing at the sand and gravel operation located at approximately milepost 43 within the southern portion of the plan area. Construction of the proposed transmission line may result in short-term impacts to access and development of the quarry. Assuming that the Proposed Action would also span the quarry, these impacts would be incurred only during construction. Once construction is complete, the impact would be reduced or eliminated.

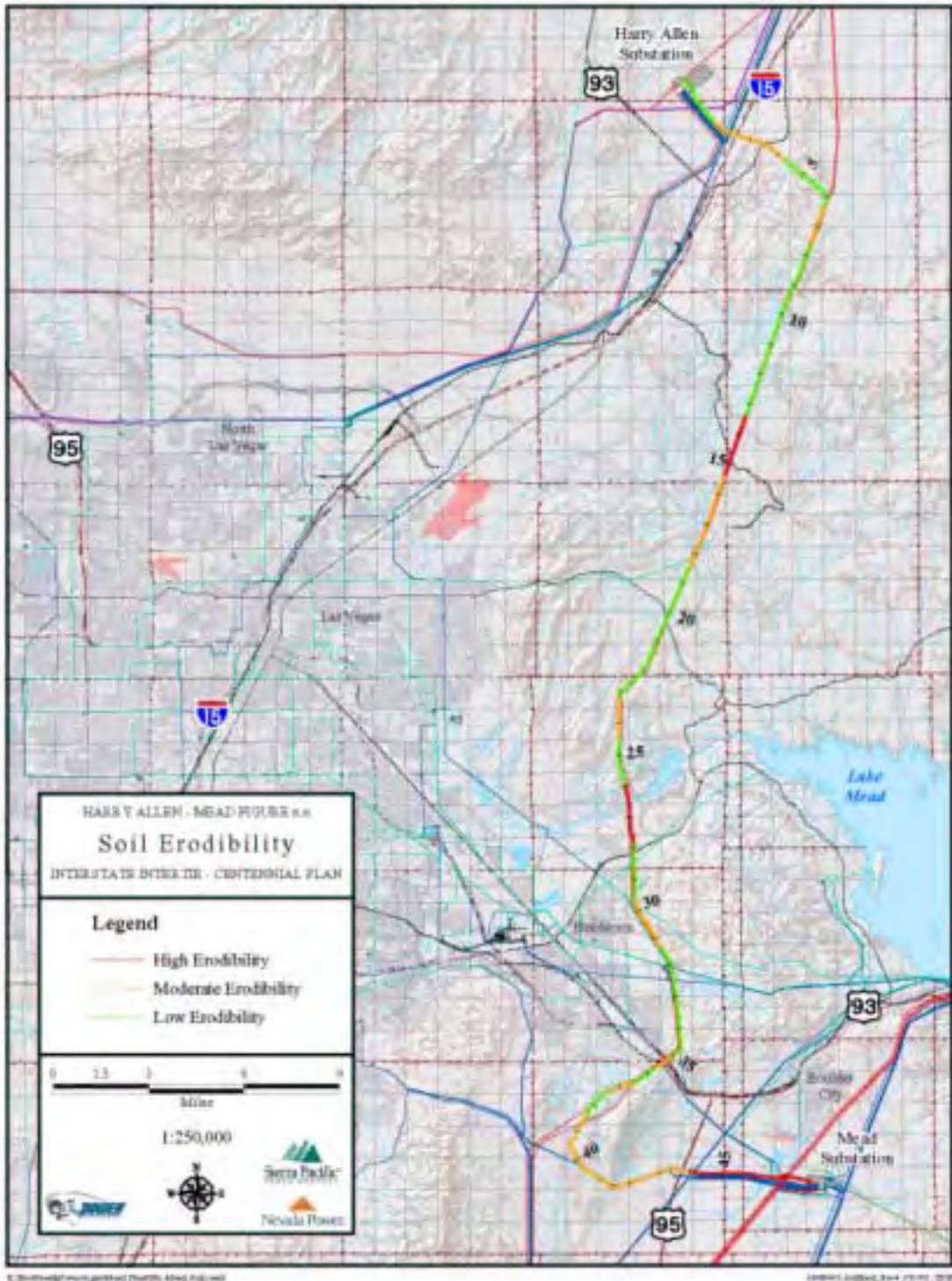


Figure 4-1 Erodibility of Soils

Soils

Overhead transmission line construction requires excavation, grading and possibly soil stockpiling. Construction activities that remove vegetation and cause soil surface disturbance would likely result in increased soil erosion rates. Erosion rates would depend on site-specific characteristics including soil type, disturbance mitigation measures and climatic conditions. Water erosion would generally be associated with localized precipitation events.

The potential for wind erosion would generally be highest between the months of November through February. Erosion could result in some loss of productive potential. Soil erosion impacts would be short term in duration. The majority of detailed soil mapping units in the plan area has wind and water erosion potentials. Refer to Figure 4-1 for a map identifying soil erodibility within the plan area.

Soil compaction could occur as a result of construction activities associated with the Proposed Action. Rubber-tired vehicles generally compact soils more than tracked vehicles. The extent of compaction would depend in large part on soil moisture content and the physical characteristics of a particular soil type. Compaction tends to be most severe when soils are moist to wet. Very dry and very wet soils generally would not compact as severely. Compaction impacts would generally be short term in duration, but would have the potential to affect soil resources in the long term.

Relocation of soil resources would occur during construction activities. Road improvement, new road construction and transmission tower foundation placement would result in the displacement of soil resources. These impacts would be localized and limited in terms of the effects on overall plan area soil resources. Though limited in extent, impacts associated with soil relocation would be long term in duration.

Mitigation Measures

Applying management practices as identified in Chapter 2, Table 2-3, would lessen construction-related impacts to geology and soils from construction and operation of the Proposed Action. Mitigation measures identified for biological and visual resources would also minimize further impacts to geologic resources that may be incurred by road building, road improvement or general disturbance associated with construction activities.

4.3.6 Paleontological Resources

Potential impacts to nonrenewable significant paleontological resources associated with construction activities could include crushing, destruction and removal.

Impacts to Paleontological Resources

Impacts to paleontological resources were analyzed for the entire project area and the sensitivity ranking (high, low, undetermined) for the entire project corridor is defined by milepost. Locations with significant paleontological resources were identified by milepost and geological formation. The results of this study and recommendations are

summarized in the paleontological impacts table in Appendix D. Mitigation measures were considered and a final estimate of residual impacts was made.

Mitigation Measures

The paleontological resources literature research and field inventory has been completed, and a formal, agency-reviewed plan that addresses the treatment of paleontological resources discovered during construction has been completed. At this point, the following specific Paleontology Actions (PAs) constitute the treatment plan. They are summarized by milepost and locality in the paleontological impacts table in Appendix D.

- PA-1: Prior to construction, orientation workshops would be prepared and presented that explain paleontologic mitigation guidelines and procedures to construction personnel and other environmental monitors.
- PA-2: Prior to construction, all exposed paleontologic resources and associated contextual data identified during the field inventory would be recovered. This recovery would be conducted by qualified professional vertebrate paleontologists with regional experience, under permit from the Nevada BLM, to recover exposed fossils and associated contextual data identified during the field survey.
- PA-3: During the construction phase, there would be full-time monitoring in rock units that have high paleontologic sensitivity while units of undetermined sensitivity would be spot-checked monitored. Monitoring would be conducted by qualified professional vertebrate paleontologists with regional experience, under permit from the Nevada BLM. Significant fossils discovered would be salvaged. Salvage would include recovery of exposed significant paleontologic resources, removal and/or molding of exposed trackways and sampling where necessary to recover microfossil remains.
- PA-4: Significant fossil resources that cannot safely be recovered would be stabilized, documented and conserved.
- PA-5: Paleontologic resources recovered would be prepared to permit their identification and permanent preservation. This includes stabilization of large remains and screen washing of fossiliferous sediments to recover significant microfossil remains.
- PA-6: Recovered fossils would be analyzed, including (but not limited to): identification to genus/species, element, etc.; interpretation of species abundance and diversity; determination of sex ratios and the relative abundance of ontogenetic age groups; dating of remains as appropriate; evaluation of potential taphonomic factors; and comparison with other vertebrate faunas from the Mojave Desert and the southwestern United States.
- PA-7: Recovered significant fossils would be preserved and curated, including all associated contextual data, at a Federally recognized, accredited repository with long-term retrievable storage.
- PA-8: A final report, including an itemized and accessioned inventory of recovered specimens, would be prepared by a professional vertebrate

paleontologist and distributed to the appropriate lead and cooperating agencies. This report shall include documentation of any and all significant fossil vertebrate localities and/or fossil plant localities.

- PA-9: During and following excavation, information obtained as a result of the paleontologic investigation would be appropriately disseminated. Such dissemination should include publication of results in professional scientific journals. As deemed appropriate by the BLM, this may also include public presentations, classes, videos and other forms of outreach and education. On-site exhibits may be considered if appropriate.

4.4 Irreversible and Irretrievable Commitment of Resources

Resources committed to the Proposed Action would be material and nonmaterial, including financial. Irreversible commitment of resources for the purposes of this section has been interpreted to mean that those resources once committed to the Proposed Action would continue to be committed throughout the 40-year life of the plan. Irretrievable commitment of resources has been interpreted to mean that those resources used, consumed, destroyed or degraded during construction, operation, maintenance and abandonment of the Proposed Action could not be retrieved or replaced for the life of the plan or beyond. The irreversible and irretrievable commitment of resources for the Proposed Action is summarized in Table 4-5.

Table 4-5 Irreversible and Irretrievable Commitment of Resources

Resource	Type of Commitment/Reason for Commitment	Irreversible	Irretrievable
Geology/Soils	Sands and gravels used for concrete foundations	Yes	Yes
Surface Water	Grading during construction	No	Plan lifespan
Biological	Disturbance to and/or loss of vegetation, habitat and wildlife species	Yes	Plan lifespan
Air Quality	Degradation of air quality during construction	Yes	Yes
Visual	Viewshed and Scenic Quality alteration Construction and operation	Yes	Plan lifespan
Land Use	Exclusion of other uses and Construction and operation	Yes	Plan lifespan
Cultural	Potential disturbance of cultural sites during construction and operation	Yes	Yes
Paleontologic	Potential disturbance of sites during construction and operation	Yes	Yes
Socioeconomic	Slight Increased regional and local employment and revenues	No	Plan lifespan

4.5 Cumulative Effects

4.5.1 Introduction

Cumulative impacts result “from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions.” The impacts of past and present actions combine to form existing conditions-considered in the Affected Environment sections of Chapter 3.

Cumulative impacts can result from individually minor, but collectively significant, onsite or offsite actions occurring over a period of time (40 CFR 1508.7). Those actions within the spatial and temporal boundaries (project impact zone) of the Proposed Action are considered in this EA. The spatial and temporal boundaries vary depending on the type of action proposed.

The areas of cumulative effects analyses are based generally on the 212 airshed boundary, watershed basins, aquifer boundaries, ecological regions and highway locations. This document utilizes the BLM Environmental Assessment Number NV 050-2003-89 developed for the sale of BLM managed public lands within the disposal boundary of Southern Nevada Public Lands Management Act (SNPLMA) of 1998, as amended, Public Law 105-263, 112 Stat 2343, (BLM, 2003). This area has been identified as the primary area of future development within the Las Vegas Valley.

4.5.2 Impact Assessment Methods

Unless otherwise noted, this analysis considers impacts that could occur over the potential 40-year life of the Proposed Action. This timeframe includes the estimated period for completion of activities, along with a period of institutional control of lands and resources.

Identification of the affected environment or baseline condition is detailed in Chapter 3 and will not be revisited in this section. In addition to the BLM land sale EA described above, the following environmental documents were utilized for identifying cumulative impacts:

- Moapa Paiute Energy Center FEIS (BIA and BLM, 2002)
- Harry Allen–Crystal 500kV Transmission Line EA (BLM, 2001)
- Harry Allen–Northwest 500kV Transmission Line EA (BLM, 2002)
- Harry Allen–Apex 500kV Transmission Line EA (BLM, 2002)

4.5.3 Existing Energy Systems

The Proposed Action has been sited within a BLM-designated corridor for 40 miles of the 48-mile route. Outside the corridor, the route was sited adjacent to existing transmission lines wherever feasible. Although the Proposed Action lies outside of the SNPLMA for all but approximately 1-1/2 miles, the Las Vegas Valley includes many existing transmission lines, substations and generation plants owned and operated by Nevada

Power, Los Angeles Department of Water and Power, Western Area Power Administration, Basic Management Inc., Colorado River Commission and Valley Electric. Refer to the Land Use section in Chapter 3 for further information on existing features.

The cumulative effect that these facilities have is based on the need to supply electric power to the community based land developments within the SNPLMA boundary.

4.5.4 Reasonably Foreseeable Future Actions

The following energy facilities relating to generation, substations and transmission are currently being planned by Nevada Power to meet their mandate of providing for energy needs within their service area.

Generation Facilities

The following proposed generation facilities are required in 2006 and 2007 to serve forecasted load growth within the SNPLMA boundary in the Las Vegas Valley and to better balance Nevada Power’s portfolio of purchase power contracts versus company-owned generation facilities.

Schedule

- Simple cycle combustion turbine at Harry Allen - 2006
- Combined cycle plant at Harry Allen - 2007
- Undetermined amount of additional generation at existing facilities - 2010

Substation Facilities

Distribution substations act as the load service hubs for the distribution system. The distribution substations listed are all planned for the Las Vegas Valley and are driven by new load growth. The distribution substations are either 138/12kV or 69/12kV.

Transmission substations provide a redundant source for the lower voltage (138 and 69kV) transmission system. The transmission substations listed are all planned for the Las Vegas Valley.

Schedule

- 3 distribution substations - 2004
- 5 distribution substations - 2005
- 2 distribution substations/1 transmission substation - 2006
- 5 distribution substations/2 transmission substations - 2007
- 5 distribution substations - 2008
- 2 distribution substations - 2009
- 2 distribution substations - 2010

Transmission Facilities

Additional transmission facilities will be required to integrate new substations into the existing transmission network. Line lengths would vary from approximately two hundred yards to several miles. These projects would be within the Las Vegas Valley but not necessarily within the SNPLMA boundary.

Various reconductor/modifications of existing transmission facilities would be required to accommodate higher demand due to load growth and/or provide added reliability. These projects would be within the Las Vegas Valley.

Additional transmission systems from Harry Allen Substation to Crystal Substation to Eldorado/Marketplace substations would provide interconnections to future generation resources and/or increase transmission capability between western regions for added energy interchange. This project would likely follow the existing 500kV corridor.

A 500kV transmission line extending from Ely, Nevada to the existing Harry Allen Substation (Harry Allen–Gonder) would provide added import capability for Nevada Power and Sierra Pacific Power and offer interconnection between the desert southwest and northwest. The line would follow existing transmission corridors in Nevada such as the SWIP corridor.

Additional 230/500kV interconnections would provide support for future generation at existing generation sites, such as Harry Allen. The likely transmission routing would be along the existing 230kV transmission corridor from Reid Gardner to Harry Allen substations.

Additional 230kV transmission from Northwest Substation to Mercury Substation would provide transmission to support future load growth and/or generation expansion at the Nevada Test Site or Valley Electric Association. The line would likely follow the existing Northwest–Mercury 138kV transmission line.

Additional 230kV transmission from Harry Allen Substation to Pecos/Winterwood substations would provide transmission from existing/future generation in Apex to load centers within the Las Vegas Valley. The likely line route would follow existing 230kV lines to the Las Vegas Valley and 138kV lines within the Las Vegas Valley.

Schedule

- Transmission extensions for the planned (27) distribution substations and (3) transmission substations - 2004-2010
- Various reconductor/modifications to existing transmission lines – 2004-2010
- Harry Allen–Crystal–Eldorado/Marketplace 500kV line - >2010
- Harry Allen–Gonder 500kV line - >2010
- 230/500kV lines to new Nevada Power generation (e.g. Reid Gardner) - >2010
- Northwest–Mercury 230kV line - >2010
- Harry Allen–Pecos/Winterwood 230kV - >2010

Other Facilities

The addition of the generation plants, transmission lines and substations listed above would provide the ability for growth to continue within the SNPLMA boundary thereby increasing the level of cumulative impact to the resources within the Las Vegas Valley. Clark County has the responsibility of permitting development within the SNPLMA boundary and the entire Las Vegas Valley. Local planning departments would work to reduce these impacts as they are identified.

The population within the Las Vegas Valley grew steadily over the last decade. Population growth fuels land development, such as the construction of residential, commercial, industrial and public service facilities and improvements. These developments can result in loss of habitat, as well as construction related air quality and other impacts. Community based land development tends to have more permanent and more concentrated impacts than that of energy projects, particularly with respect to biological, cultural, air and water quality resources.

Many new commercial and housing projects are planned, approved and currently under construction in the Las Vegas Valley, some in the areas planned for future substation and distribution expansion. These projects would require new permanent roads and other infrastructure.

Some of the more notable planned and proposed major commercial/industrial projects affecting the entire Las Vegas Valley include the Southern Nevada Water Authority second-source water pipeline, the Water Treatment Plant discharge project, the Hoover Dam Bypass and Boulder City Corridor, Ivanpah Energy Center, Ivanpah Valley flood control structure, Ivanpah airport and widening of U.S. Highway 95.

The cumulative effects analysis done as part of the Las Vegas RMP identified the potential for development within the SNPLMA boundary in the Las Vegas Valley including 25,540 acres of public land disposal and 54,000 acres of private land. Using information obtained from the Clark County Department of Comprehensive Planning, the BLM predicted that over a 20-year period, development of this land would occur at an estimated rate of 4800 acres per year within the Las Vegas Valley. Land development would be a mix of residential, commercial and recreational. The following breakdown of the 4800 acres of annual development was identified in the Las Vegas Land Sale EA (2003):

- Single Family Homes – 65% (3120 ac)
- Apartment Complex – 15% (720 ac)
- Office Building – 13% (624 ac)
- Moderate Size Casino – 3% (144 ac)
- Convenience Store – 2% (96 ac)
- City Park – 2% (96 ac)

When considered with Clark County’s expected 4800 acres of annual development, the Proposed Action would not contribute substantially to cumulative effects since it lies

outside of the SNPLMA boundary for all but 1-1/2 miles. However, it would permanently disturb an additional 165.5 acres and temporarily disturb another 125.1 acres.

4.5.5 Cumulative Effects on Environmental, Cultural and Human Resources

The following sections identify cumulative effects to key resources (biological, air quality, visual and cultural resources) as well as other resources potentially affected by the Proposed Action (land use, geology, soils, water and paleontological resources).

Cumulative Impacts to Key Resources

Biological Resources

Cumulative effects on biological resources are generally additive and proportional to the amount of ground disturbance within specific habitat areas. The Clark County Department of Comprehensive Planning in cooperation with the FWS has addressed the cumulative effects on biological resources for development and construction activities on a countywide basis. As a result, the Multi Species Habitat Conservation Plan (MSHCP) was developed to address sensitive and protected biological resources on private and public lands in Clark County.

The development of energy facilities with their emphasis on utility line infrastructure on public lands may potentially impact some of these sensitive species. Sensitive species in the Las Vegas Valley that are covered under the MSHCP include several species of plants and animals, as discussed earlier in chapters 3 and 4 of this EA. Some of these species are also Federally listed as threatened or endangered. Mitigation measures would be implemented to lessen or eliminate potential impacts to biological resources.

In general, constructing transmission lines can result in minimal long-term effects to both botanical and wildlife species. Unlike concentrated developments, such as mines, shopping malls, residential development or parking lots, transmission lines are often constructed in desert environments with little grading, except for roads needed to construct the lines and maintain them over the life of the project. Areas around transmission structures need only be graded if relatively flat areas are not available for construction workers and equipment to assemble and erect the structures.

Speed limits are imposed on these roads to limit dust and protect special status species (e.g., desert tortoise). Where roads exist, or where a new transmission line is located adjacent to an existing line, new roads are not constructed along the centerline. Spur roads (short road segments from an existing road to the structure locations) are favored in such cases.

Long-term direct impacts to plants and animals can be attributed to fragmentation caused by new access roads. The botanical and wildlife habitat in Clark County is being increasingly fragmented by new development causing populations to be separated from critical food and water sources and other populations of the same species. However, some species benefit from the construction of transmission lines by forming relatively undeveloped corridors for animals to travel from one habitat to another.

Opening up areas to casual vehicular access by the public causes indirect impacts. Increased hunting, wildlife harassment, vehicle collisions and spread of noxious weeds can result in areas that had previously been unroaded. Other indirect effects to wildlife result from providing additional perching and/or nesting structures for birds that may prey on juvenile tortoises and other sensitive species.

Increasing access to wildlife habitat areas also increases the chances for human/wildlife encounters and conflicts on the fringes of the Las Vegas Valley. These interactions lead to an increased work load for wildlife managers who must deal with resolving these conflicts both on an individual basis and on a large scale, through negotiations and consultation with other government agencies and private corporations (Roddy Shepard, NDOW, personal communication, September 2003).

A Restoration Plan is being developed as part of the Final Plan of Development that would include mitigation measures to reduce or eliminate impacts to biological resources.

Air Quality

Construction-related Effect

The main priority pollutants on this project are CO and PM. They relate to this Proposed Action through the effects of vehicle emissions and fugitive dust respectively. CO is the primary contributor from vehicle exhaust and PM is the primary contributor from land disturbance.

The State Implementation Plan (SIP) projects the amount of future pollutants including CO and PM that are likely to result from Clark County sources. The SIP for CO is available to the public, however, the SIP for PM is undergoing revision and is not yet available (S. Day, Clark County DAQM, personal communication, October 24, 2003). The draft SIP Appendix B currently projects that Clark County will create 276.48 tons per day of PM pollutants for controlled PM emissions for the year 2003 on a Valley wide basis. The CO projected tons per day obtained from the SIP, Appendix A, Table 7.2 was projected at 387.16 for the year 2000.

The Proposed Action contributes only a small amount of these pollutants and mainly on a short-term basis during the construction phase, but would add temporarily to the cumulative effect within the SNPLMA boundary in the Las Vegas Valley, should multiple activities occur simultaneously. Most of this pollutant load is due to vehicle/equipment use and wind blowing across disturbed land during the construction activities. These effects would be mitigated by Clark County regulations for dust control and CO emissions.

Visual Resources

Project-specific visual impacts from some of the energy facilities would likely be reduced through mitigation in the type of structures and color selection of the proposed facilities. Many of the energy facilities would be located in or adjacent to designated utility corridors and right-of-ways, which have been zoned for these types of facilities. However the development of 4,800 acres of land per year within the SMPLMA boundary in the Las Vegas Valley would add considerable amounts of manmade elements to the

environment. These manmade elements would cumulatively impact the visual resources of the area by introducing contrast to the existing natural landscapes.

Normally, the first constructed objects in a natural setting cause the most noticeable change because of the contrast of form, line, color and texture with the surroundings. Each successive change becomes less noticeable than the first. However, the sum of all the changes (e.g., form, line, color and texture) is more evident to the casual observer. Therefore, the first transmission line in a natural area normally causes the greatest incremental change, but the cumulative visual impact of a corridor increases with the addition of each new line. Hence, a multi-transmission line corridor would be more visible at greater distances than a single transmission line because of the cumulative contrast with the natural landscape.

The significance of the cumulative impact would depend on the level of visual contrast between the existing surroundings and the Proposed Action and whether the scenic quality of the surroundings would be diminished. The Proposed Action in conjunction with the other projects discussed above involving the addition of constructed objects into natural settings, could cause cumulative impacts to residential viewers, highway viewers and to some recreation viewpoints in several areas. The route would have cumulative effects on scenic quality where it parallels existing transmission lines or is adjacent to housing developments, commercial and industrial facilities and other utility facilities within the SNPLMA boundary.

Cultural and Paleontological Resources

Construction and installation of the transmission line in concert with other past, present and future project in the Las Vegas Valley would contribute to cumulative damage to cultural and paleontological resources. Surface disturbance from ground-disturbing construction activities and new and improved access roads would allow for disturbance of prehistoric and historic properties as well as paleontologic resources that are fragile and non-renewable resources. Opening up areas to vehicular access by the public can cause indirect cumulative impacts to cultural resources through illegal “pot hunting” and inadvertent damage to these sites. However, the proposed transmission line would be located mostly within an existing utility corridor, thus minimizing new impacts to undisturbed sites. In addition, this project and other future projects in the Las Vegas Valley would be required to consult with appropriate agencies and tribal representatives and provide appropriate mitigation for the discovery and collection of important cultural and paleontologic resources. Therefore, the Proposed Action would not contribute measurably to cumulative impacts on these resources.

Cumulative Impacts to Other Resources

Land Use

Approximately 165.5 acres of public and private lands would be permanently removed from multiple use by the presence of tower foundations and access roads for the Proposed Action. For this cumulative analysis, it was assumed there would be 4800 acres of land developed each year for the next 20 years within the SNPLMA boundary in the Las

Vegas Valley. Public and private lands would be impacted by this future development as they have been impacted by past and present projects.

The Las Vegas Valley is experiencing the highest rate of growth in the country causing a fast rate of urbanization of the rural landscape. If power remains readily available in keeping with Nevada Power's mandate and there are no other limiting factors, areas may experience a continued increase in development. This new development would impact the quantity of lands available for other uses such as open space and wildlife habitat.

The miles of additional roads that would result from the Proposed Action and other development would impact land use by increasing the access opportunities to areas previously inaccessible or less accessible to motorized vehicles. Increased access can lead to increased recreational activities such as hunting/shooting, wildlife viewing and off-road vehicle use. This increased use would impact the ability of land managers to maintain land for preservation or natural habitat. As the number of developments continues to increase, the ability to successfully preserve the archaeological, cultural and natural resources of the area may decrease.

Socioeconomics

Environmental Justice

The Proposed Action would have no effect on environmental justice and therefore, would not contribute to cumulative impacts within the Las Vegas Valley.

Public Safety

The construction of additional transmission lines would have a cumulative electric and magnetic fields effect within a right-of-way. This impact would be reduced by design modifications, such as arrangement of conductors. Therefore, there would be little or no difference in EMF levels at the edge of the corridor caused by adding one or more transmission lines to an existing corridor.

The amount of hazardous materials needed to construct the Proposed Action is negligible and would be managed by implementing chemical handling and storage plans. Spill prevention plans would be required and would include construction of chemical handling and containment facilities. In addition, staff would be trained in hazardous materials safety, handling, clean up and removal. With implementation of these measures, the Proposed Action would not contribute to cumulative impacts with the Las Vegas Valley from hazardous materials.

Water Resources

Drainage studies containing information on site-specific changes in the timing and amount of surface water flows resulting from the project would be required for each project. Drainage studies and grading plans would evaluate both the onsite and offsite effects. These would have to be reviewed and approved by the Clark County Department of Public Works before the projects could legally proceed.

All facilities would be required to obtain discharge permits. Adherence to standard and site-specific permit conditions for construction and operation of the facilities would minimize individual or collective impacts to surface water quality.

The Proposed Action would use water for dust control during construction only and would place no long-term demand on groundwater. As a result, this project would not contribute to cumulative impacts on groundwater within the SNPLMA boundary in the Las Vegas Valley.

Geology and Soils

The Proposed Action would contribute only site-specific and localized individual ground surface changes. The projects collectively would not substantially alter prevailing topography and/or surface relief within the SNPLMA boundary in the Las Vegas Valley. Therefore, the cumulative impact to surface contour features would be minor.

Chapter 5

Consultation and Coordination

5.1 Introduction

In response to the National Environmental Policy Act of 1969 (NEPA) and Council of Environmental Quality (CEQ) regulations (1978) for implementing NEPA, a coordination program was developed for the Harry Allen–Mead Transmission Line to ensure members of the public and Federal, state and local agencies were contacted, consulted and given adequate opportunity to be involved in the process. This chapter describes the lead agency’s (BLM) scoping process, the cooperating agencies’ involvement, stakeholder issues and concerns identified and other formal and/or informal reviews or consultations.

The scoping phase of the Environmental Assessment (EA), covered in this section, consisted of agency and other stakeholder contacts for purposes of gathering data, disseminating plan information and identifying and understanding the issues identified during scoping. Additionally, previous environmental documentation and existing agency data was reviewed and evaluated for applicability and adequacy for use during this EA and is discussed in Section 5.2.

The EA process was begun with the filing of a right-of-way application by Nevada Power in October 2002 with the BLM to construct a 500kV transmission line from the Harry Allen Substation to the Mead Substation. Following the application, the BLM determined that an EA would be required. BLM implementing regulations require an EA be completed for this Federal action to determine whether there are significant environmental impacts from the construction of the 500kV transmission line and associated ancillary construction activities on Federal land.

5.2 Previous Projects

Existing published and unpublished environmental data, maps, reports and statements prepared for previous transmission line-related actions in the area were reviewed and evaluated to determine their applicability and adequacy for use in the environmental studies. The most relevant information was incorporated from the following reports:

- Harry Allen–Northwest 500kV Transmission Line Environmental Assessment, March 2002
- Harry Allen–Crystal 500kV Transmission Line EA, June 2001
- Crystal Substation Expansion and Harry Allen–Crystal 500kV Transmission Line Reroute Environmental Assessment, November 2001
- Crystal Substation Environmental Assessment, October 1997
- Moapa Paiute Energy Center Draft Environmental Impact Statement, March 2001
- Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement, May 1998

- Proposed Apex Land Sale Environmental Assessment, October 1998
- Harry Allen Generating Station EIS, 1980

5.3 Agency Contacts

Agencies and organizations having jurisdiction and/or specific interest within the proposed project area were contacted following the right-of-way application filing to inform them of the proposed project, to verify the status and availability of existing environmental data and to solicit input during the EA process. See Section 5.4 for a discussion on Cooperating Agencies. Formal consultations were conducted with specific agencies and discussed in Section 5.4.

A scoping letter, study area map and plan schedule was sent out to the following Federal, state and local agencies:

Federal

U.S. Department of the Interior, National Park Service (NPS)
U.S. Department of the Interior, Bureau of Land Management (BLM)
U.S. Department of the Interior, Fish and Wildlife Service (FWS)
U.S. Department of the Interior, Bureau of Reclamation (USBR)
U.S. Department of Energy, Western Area Power Administration (Western)
U.S. Army Corps of Engineers (COE)
Federal Aviation Administration (FAA)
Nellis Air Force Base

State

State Historic Preservation Office (SHPO)
Nevada Division of Wildlife (NDOW)
Nevada Division of Environmental Protection
Nevada Division of State Lands
Nevada Division of Transportation

Local and County

City of North of Las Vegas
City of North Las Vegas Planning Commission
City of Henderson
Clark County Public Works
Clark County Advanced Planning Division
Clark County Environmental Planning Division

Clark County Major Projects Team
 Clark County Division of Aviation
 City of Las Vegas City Planning
 City of Las Vegas Planning Commission
 Boulder City Community Development

5.4 Cooperating Agencies

In December 2002, BLM as the lead Federal agency, sent a letter to the Federal agencies inviting each to participate in the process as a cooperating agency and inviting each to attend a January 9, 2003, Agency Meeting to learn about the proposed project, ask questions and to help each determine their involvement. Western, USBR and Nevada Division of Wildlife attended the meeting on January 9. Western and USBR both identified itself as a cooperating agency for the proposed project. Western and USBR immediately began attending monthly team meetings and participating in the decision-making process.

5.5 Scoping Process

5.5.1 Coordination with BLM

Several meetings were held with the BLM and cooperating agencies to address the proposed project’s purpose and need, EA significance criteria, results of the studies, routing and required mitigation. The agencies, Nevada Power and its environmental contractor met on a monthly basis to discuss any issues and project needs. Representatives of BLM and the cooperating agencies toured the proposed alignment. As a result of these meetings, the following list of major issues and/or concerns were expressed by BLM and the cooperating agencies:

- Cultural resources mitigation planning and scheduling
- Section 7 consultation requirements and timing
- Minimizing impacts to natural resources
- Minimizing visual impacts
- Logically, accurately and appropriately addressing cumulative effects

5.5.2 Public Scoping Meetings

The proposed project was first introduced to the community and interested stakeholders in July 2001 as the Interstate Intertie–part of the Centennial Plan designed to move interstate electricity supplies through the heavily urbanized Southern Nevada region. Nevada Power held 30 public meetings and open houses, along with several neighborhood meetings, at locations convenient to the communities potentially affected

by the routing of the transmission line. Each workshop provided consumers with an overview of the process, alternative route maps, aerial maps, photographs of equipment, frequently asked questions/answers sheet, list of upcoming open house workshops, environmental information, energy conservation brochures and information, as well as customer service information. Workshops were held in Northwest Las Vegas, Northeast Las Vegas, Henderson, Central Las Vegas, Southwest Las Vegas and Boulder City.

Community comments were very positive about the open house format and staffing. Community comments reflected BLM's emphasis to use existing transmission line corridors to the maximum extent. Community comments and recommendations also included:

- Respect for existing master plans of the communities affected
- Use of low cost options
- Pursuit of renewables as future energy sources
- Implementation of conservation measures such as air conditioning load management

Henderson citizens urged Nevada Power to build along existing corridors using the most eastern routes possible. Air quality, protecting natural wildlife and respecting and protecting the natural environment were also noted in a few comments, again consistent with the agencies' concerns.

In 2003, after submitting an official right-of-way application to BLM, Nevada Power began hosting its second round of public workshops, with the first workshop being held on January 22, 2003, at the Walnut Recreation Center in Las Vegas. Attendance was extremely low. On January 27, Nevada Power hosted its second community workshop at the Henderson Convention Center. There were attendees from the City of Henderson Planning Department and Neighborhood Services and 18 other community attendees. Four comment sheets were received with positive remarks. Most people had no objection to the proposed project due to the lines being on the east side of the existing lines. Two members of the Sierra Club did express some concern due to the visual impact on the Rainbow Gardens hiking trails. On January 29, Nevada Power hosted its third and final Community Workshop in Boulder City. There were eight attendees; four of them were Boulder City Staff Members. Feedback was positive.

In addition to public workshops that Nevada Power conducted, BLM and cooperating agencies held a public scoping meeting on April 2, 2003. Information developed during the scoping process formed the basis for transmission line routing, impact assessment and mitigation planning studies.

As directed by the CEQ regulations, the extent of analysis for the issues and concerns raised during the agency and public scoping process were determined by BLM and the cooperating agencies.

5.5.3 Meetings with Local Officials and Local Stakeholders

Nevada Power representatives met with several public and community representatives to present an overview of the proposed project. Information provided included a packet outlining the scope and need for the proposed project, maps and photographs of the equipment that would be installed. The following is a list of the various local councils and commissions that Nevada Power met with to discuss the proposed project.

- North Las Vegas Planning Commission
- North Las Vegas City Council
- Las Vegas City Council
- Las Vegas City Planning Commission
- Clark County Regional Planning Commission
- Clark County Planning Commission
- Clark County Commission
- Clark County Multispecies Habitat Conservation Group
- City of Henderson Planning Commission
- City of Henderson City Council
- Boulder City Council
- River Mountain Ranch Estates Home Owners' Association
- River Mountains Trail Partners
- City of Henderson

5.6 *Formal Consultation with Federal Agencies*

In addition to the BLM, Western and USBR, other agencies (identified in Section 5.3) were contacted for specific information during the preparation of this EA.

To comply with the Endangered Species Act (1973) as amended and the implementing regulations for Section 7 consultation, species lists were requested from the U.S. Fish and Wildlife Service (FWS) at the beginning of the EA process.

Section 7 Consultation is being conducted for the desert tortoise, southwestern willow flycatcher, Yuma clapper rail, bald eagle, western yellow-billed cuckoo and relict leopard frog. These Federally-listed biological resources were addressed in a Biological Assessment (BA) submitted in October 2003 to FWS. BLM received a notice of initiation of consultation from FWS in November 2003.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that any undertaking on Federal land or land requiring a Federal permit take into account potential effects to cultural resources that are on or eligible for the National Register of Historic Places (NRHP). Section 106 consultations and associated cultural surveys were

conducted as required. BLM and the cooperating agencies conducted consultations with Native Americans as deemed appropriate. Refer to Chapter 3, Section 3.3.6 Cultural and Ethnographic Resources for details regarding tribal communications.

The intensity of impacts to cultural resources is determined in accordance with the NHPA, which permits three options: "no effect," "no adverse effect" or "adverse effect." Effects to cultural resources are evaluated based on the Secretary of the Interior's criteria for eligibility for listing of a cultural property in the NRHP, as per Section 106 of the NHPA. Archaeological sites that fail to meet any of the Secretary's criteria regarding the historical and/or cultural significance of a property (criteria a through c), or regarding the potential of an archaeological site to provide information on the history of the region (criterion d), are termed ineligible for nomination to the NRHP. If agency and SHPO concurrence has been obtained on a declaration of ineligibility, impacts to ineligible properties are not considered adverse.

An Archeological Survey of the Harry Allen to Mead 500kV Transmission Line, Nevada Cultural Resources Report CR5-2462(P) was submitted to SHPO in early December 2003. SHPO concurrence on the report determination was received on January 5, 2004.

5.7 Public Review of the EA

Public review of the EA will be completed following the 30-day comment period. If no significant impacts are identified and the proposed project is approved, the BLM, in cooperation with Western and USBR, will issue a Finding of No Significant Impact for public lands crossed by the Proposed Action. Cooperating agencies will issue their appropriate decision documents in cooperation with BLM's decision document.

Chapter 6

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Botanical technical review

Botanical technical review

Wildlife technical review

Cultural resources technical review

Wilderness and visual resources
technical review

NEPA technical review

Recreation resources technical review

Cultural resources technical review

Land use technical review

Project management and wildlife
technical review

Project management

Cultural resources technical review

Biological resources technical review

Land use technical review

Environmental technical oversight

Contracts

Land use technical review

NEPA technical review

Native American consultations

Chapter 7

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KOP1: Existing Condition

*Views Looking Northeast at MP 2.5 from Motorists Traveling I-15 Northbound
*Photo Date / Time: December 20, 2001 / 3:45pm
*Camera Height: Approx. 6'



KOP1 Location



KOP1: Simulated Condition

Notes

1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP2: Existing Condition

*Views Looking West near MP 26.5 from Lake Las Vegas Resort
 *Photo Date / Time: December 18, 2001 / 12:55pm
 *Camera Height: Approx. 6'



KOP2 Location



KOP2: Simulated Condition

Notes

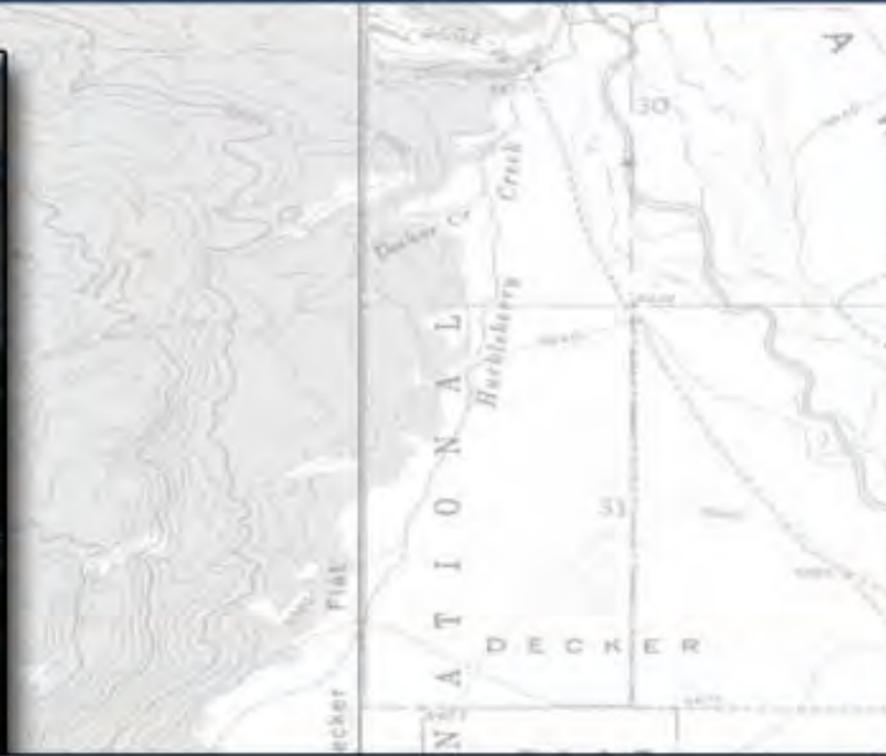
1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP3: Existing Condition

*Views Looking South at MP 28 from Residential Viewpoints within Calico Ridge Subdivision
 *Photo Date / Time: December 18, 2001 / 12:45pm
 *Camera Height: Approx. 6'



KOP3 Location



KOP3: Simulated Condition

Notes

1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP4: Existing Condition

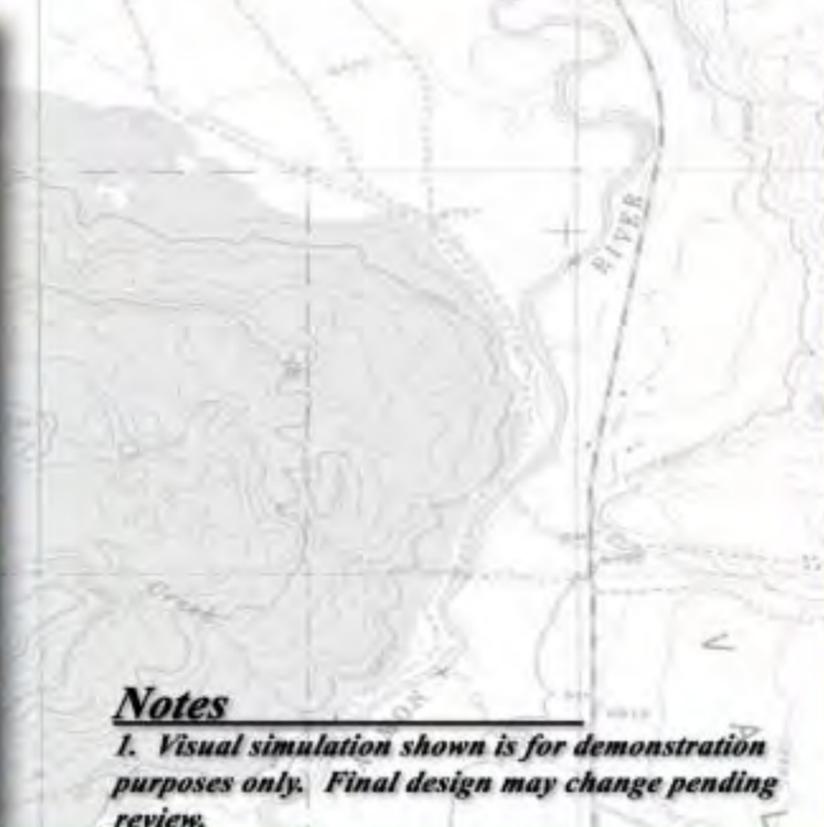
*Views Looking East at MP 29.5 from Henderson Rural Residential Viewpoints near Racetrack Road
 *Photo Date / Time: December 18, 2001 / 12:55pm
 *Camera Height: Approx. 6'



KOP4 Location



KOP4: Simulated Condition



Notes
 1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP5: Existing Condition

*Views from I-15 at MP 2.5, Looking Southwest
*Photo Date / Time: February 12, 2003 / 12:00pm
*Camera Height: Approx. 6'



KOP5 Location



KOP5: Simulated Condition

Notes
1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP6: Existing Condition

*Views from US 93 at MP 35, Looking Southeast
*Photo Date / Time: February 12, 2003 / 1:00pm
*Camera Height: Approx. 6'



KOP6 Location



KOP6: Simulated Condition

Notes
1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP7: Existing Condition

*Views from US 93 at MP 35, Looking Northwest
 *Photo Date / Time: February 12, 2003 / 3:15pm
 *Camera Height: Approx. 6'



KOP7 Location



KOP7: Simulated Condition

Notes

1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP8: Existing Condition

*Views from US 95 at MP 44, Looking South
*Photo Date / Time: February 12, 2003 / 1:45pm
*Camera Height: Approx. 6'



KOP8 Location



KOP8: Simulated Condition

Notes

1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.





KOP9: Existing Condition

*Views from US 95 at MP 44, Looking North
*Photo Date / Time: February 12, 2003 / 2:05pm
*Camera Height: Approx. 6'



KOP9 Location



KOP9: Simulated Condition

Notes

1. Visual simulation shown is for demonstration purposes only. Final design may change pending review.

