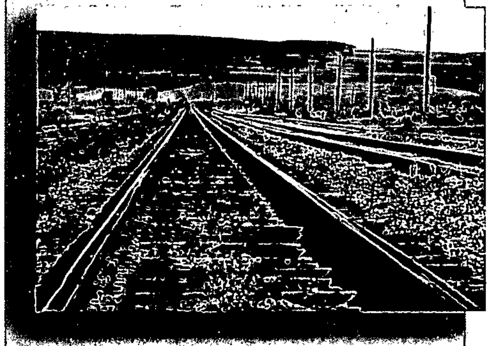

Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor

DOE/EIS-0250F-S2D

and

Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada

DOE/EIS-0369D

Volume IV

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

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5. CUMULATIVE IMPACTS

This chapter presents the results of the DOE analysis of potential cumulative impacts under the Proposed Action for the Caliente rail alignment and the Mina rail alignment. The analysis considers impacts associated with past, present, and reasonably foreseeable future and continuing actions along with potential impacts from each of the rail alignments.

Glossary terms are shown in ***bold italics***.

5.1 Introduction

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The U.S. Department of Energy (DOE or the Department) combined potential ***impacts*** reported in Chapter 4 of this Rail Alignment EIS with the potential impacts of other relevant past, present, and ***reasonably foreseeable future actions*** in the ***region of influence*** for each rail alignment. These combined impacts are called ***cumulative impacts***. Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500 to 1508) that implement the procedural requirements of the National Environmental Policy Act (42 United States Code [U.S.C] 4321 *et seq.*) (NEPA) require a cumulative impacts analysis as part of the environmental impact statement (EIS) process. In conducting this analysis, DOE followed the guidelines in CEQ handbook *Considering Cumulative Effects Under the National Environmental Policy Act* (DIRS 103162-CEQ 1997, all).

5.1.1 REGIONS OF INFLUENCE

The regions of influence for this cumulative impacts analysis encompass the potentially affected areas specific to the Caliente and Mina rail alignments. For the cumulative impacts analysis, the resource-specific regions of influence would generally be the same as those for the resource areas described in Chapter 3 and used for impact analysis reported in Chapter 4 of this Rail Alignment EIS. Table 3-1 and Table 3-78 list the regions of influence for each resource area within the Caliente and Mina rail alignment areas, respectively. The Caliente and Mina rail alignments share the same region of influence between Goldfield and the Yucca Mountain Repository, in Esmeralda and Nye Counties. The Caliente rail alignment region of influence also includes Lincoln County, while the region of influence for the Mina rail alignment also includes the Walker River Paiute Reservation and Lyon and Mineral Counties. Clark County, Churchill County, and Washoe County are generally excluded from the cumulative impacts regions of influence except as needed to maintain consistency with individual resource analyses, such as socioeconomics or air quality. Because the Caliente and Mina rail alignment regions of influence are different for much of their routes, some of the past, present, and reasonably foreseeable activities and projects affecting cumulative impacts for each rail alignment are also different, as described in this chapter.

5.1.2 APPROACH AND ANALYTICAL PERSPECTIVE

DOE used the following approach, analytical perspective, and considerations to perform this cumulative impacts analysis:

- Where analysis indicated a potential for cumulative impacts, information is quantified to the extent feasible (for example, land disturbance and water demand); however, the analysis is primarily ***qualitative***.
- The analysis considers federal, state and local government, and private activities.
- Projects included in the analysis have potential interaction in time (the foreseeable future) or space with the effects from implementation of the ***Proposed Action*** or the ***Shared-Use Option***.
- Effects from past and existing projects and activities are primarily considered in the Chapter 3 and Chapter 4 discussions for each resource area (such as mining and grazing).
- DOE considers reasonably foreseeable actions as those future actions for which there is a reasonable expectation that the action could occur, such as a Proposed Action under analysis, a project that has already started, or a future action that has obligated funding.
- Assessment of whether potential impacts would be beneficial or adverse would in many cases depend on individual and group values, beliefs, and goals, and would vary from location to location within the cumulative impacts regions of influence.

DOE has assessed potential cumulative impacts under the Proposed Action qualitatively and quantitatively to the extent available information allows. Not all quantitative information is additive because of different methodologies or conflicting regions of influence.

DOE identified activities relevant to the cumulative impacts analysis from reviews of information available from government agencies, such as environmental impact statements, land-use and natural resource management plans, and from private organizations. DOE reviewed this information for relevance to this cumulative impacts analysis based on potential geographical and temporal relationships with construction and operation of the proposed rail line along either the Caliente or Mina rail alignment. Not all actions identified in this analysis would have cumulative impacts on all resource areas.

This section describes some future actions only in general terms because the projects are in an early stage of planning or development, or they are broad concepts of activity (for example, BLM resource management planning). This analysis focuses more on geographic interaction of projects than timing of interactions because the actual timeframes for many of the reasonably foreseeable future actions are uncertain.

The approach taken for this cumulative impact analysis is consistent with the intent of CEQ regulations at 40 CFR 1502.22, *Incomplete or Unavailable Information*. This regulation directs agencies how to proceed when evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information. While information describing the characteristics and potential effects of other projects and activities within the regions of influence is primarily qualitative and, in some cases is incomplete or unavailable, there is sufficient information to complete a fair disclosure and hard look at potential cumulative impacts in the Caliente and Mina regions of influence.

5.1.3 RELATIONSHIP OF THIS ANALYSIS TO THE YUCCA MOUNTAIN REPOSITORY CUMULATIVE IMPACTS ANALYSIS

The Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (the Yucca Mountain FEIS) (DIRS 155970-DOE 2002, all) provided an analysis of potential cumulative impacts associated with construction and operation of a repository at Yucca Mountain. The portion of that analysis relevant and still valid to the Caliente and Mina rail alignments (DIRS 155970-DOE 2002) is incorporated in this cumulative impacts analysis for the proposed railroad, as appropriate.

To evaluate the potential environmental impacts, including cumulative impacts, of the revised repository design and operational plans, DOE has prepared *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250F-S1) (Repository SEIS), which includes an analysis of cumulative impacts as they relate to the Yucca Mountain Repository. Sections 5.2.1.2.1 and 5.3.1.2.1 include a description of the repository, as currently proposed, and additional context about the repository as a reasonably foreseeable action. This Rail Alignment EIS cumulative impacts analysis incorporates updated cumulative impacts information from the Repository SEIS, as appropriate.

5.1.4 RESPONSIBILITY FOR MITIGATION OF CUMULATIVE IMPACTS

DOE is responsible for impacts associated with activities for which it is the project proponent. The Department would plan and design the Caliente and Mina rail alignments to avoid sensitive and regionally important resources like Wilderness Areas and Wilderness Study Areas and to avoid or minimize impacts to sensitive environmental areas (such as wetlands) and to private property. In addition, the Department would construct and operate the proposed railroad in compliance with all applicable requirements. Actions undertaken by other proponents are subject to a variety of environmental requirements to avoid, minimize, or otherwise reduce adverse impacts on the environment.

To help comply with requirements and to eliminate or reduce potential environmental impacts, the Department would implement a variety of engineering, site planning actions, and ***best management practices***, all of which are parts of the Proposed Action (see Chapters 2 and 7). The DOE best management practices include the practices, techniques, methods, processes, and activities commonly accepted and used throughout the construction and railroad industries that facilitate compliance with applicable requirements and that provide an effective and practicable means of preventing or minimizing the environmental impacts of an action. Such practices would avoid, minimize, or otherwise reduce the direct and indirect environmental impacts of the DOE Proposed Action, thereby avoiding or minimizing contributions to direct, indirect, and cumulative environmental impacts along either the Caliente or Mina rail alignment cumulative impacts region of influence.

To the extent the Proposed Action would contribute cumulatively to impacts to regional resources, or to other activities such as BLM land management activities, DOE could take additional actions to reduce any identified impacts associated with its Proposed Action, as practicable (see Chapter 7). DOE continues to coordinate with public- and private-sector project proponents to foster adequate consideration of cumulative environmental issues. As part of its NEPA responsibilities, the Department would perform additional NEPA analysis related to the proposed railroad, if required.

5.1.5 ORGANIZATION OF THE ANALYSIS

Section 5.2 summarizes potential cumulative impacts associated with implementing the Proposed Action along the Caliente rail alignment. Section 5.3 summarizes potential cumulative impacts associated with implementing the Proposed Action along the Mina rail alignment. Section 5.4 summarizes combined repository and Nevada rail transportation impacts.

5.2 Caliente Rail Alignment

Sections 5.2.1 and 5.2.2 summarize the projects and activities considered in the Caliente rail alignment cumulative impacts analysis. Figure 5-1 shows the locations of these major projects and activities, including:

1. Southwest Intertie Project
2. Southern Nevada Water Authority Groundwater Development Project
3. Nevada Test and Training Range
4. Timbisha Shoshone Trust Land
5. Yucca Mountain Geologic Repository
6. Nevada Test Site
7. Coyote Springs Development Project
8. Union Pacific Railroad Operations
9. Toquop Energy Project
10. BLM Disposal of Public Land – Lincoln County Land Sales

This section also considers other relevant projects and actions that are not depicted on the map, such as:

- BLM planning and management actions – There are a variety of BLM past, present, and reasonably foreseeable actions within the three BLM management areas (Ely, Battle Mountain, and Las Vegas) relevant to the Caliente rail alignment.
- Various rights-of-way – Many future utility or other right-of-way corridors are not depicted in Figure 5-1 because specific routes are not known. For example, DOE and the BLM are preparing a programmatic environmental impact statement for potential designation of energy corridors on federal land in western states (70 *Federal Register* [*FR*] 56647, September 28, 2005).
- Energy and mineral development activities.
- Other regional economic development plans and activities within Lincoln, Nye, and Esmeralda Counties.

The Caliente rail alignment ranges in length from about 528 to 541 kilometers (328 to 336 miles), depending on the alternative segments considered. As a linear project, land disturbance and other direct impacts would be most likely to occur within the relatively narrow ***construction right-of-way*** and the narrower ***operations rights-of-way***. However, other direct and indirect impacts for some resources could occur outside of these rights-of-way.

To evaluate the potential for cumulative impacts, DOE identified and reviewed public and private actions in the Caliente rail alignment region of influence to determine if the impacts associated with these actions could coincide in time or space with potential impacts from construction and operation of the proposed Caliente rail alignment. Only those projects and activities DOE believes would have the potential for cumulative impacts are identified herein. In some cases, similar actions have been grouped together and listed by category of action.

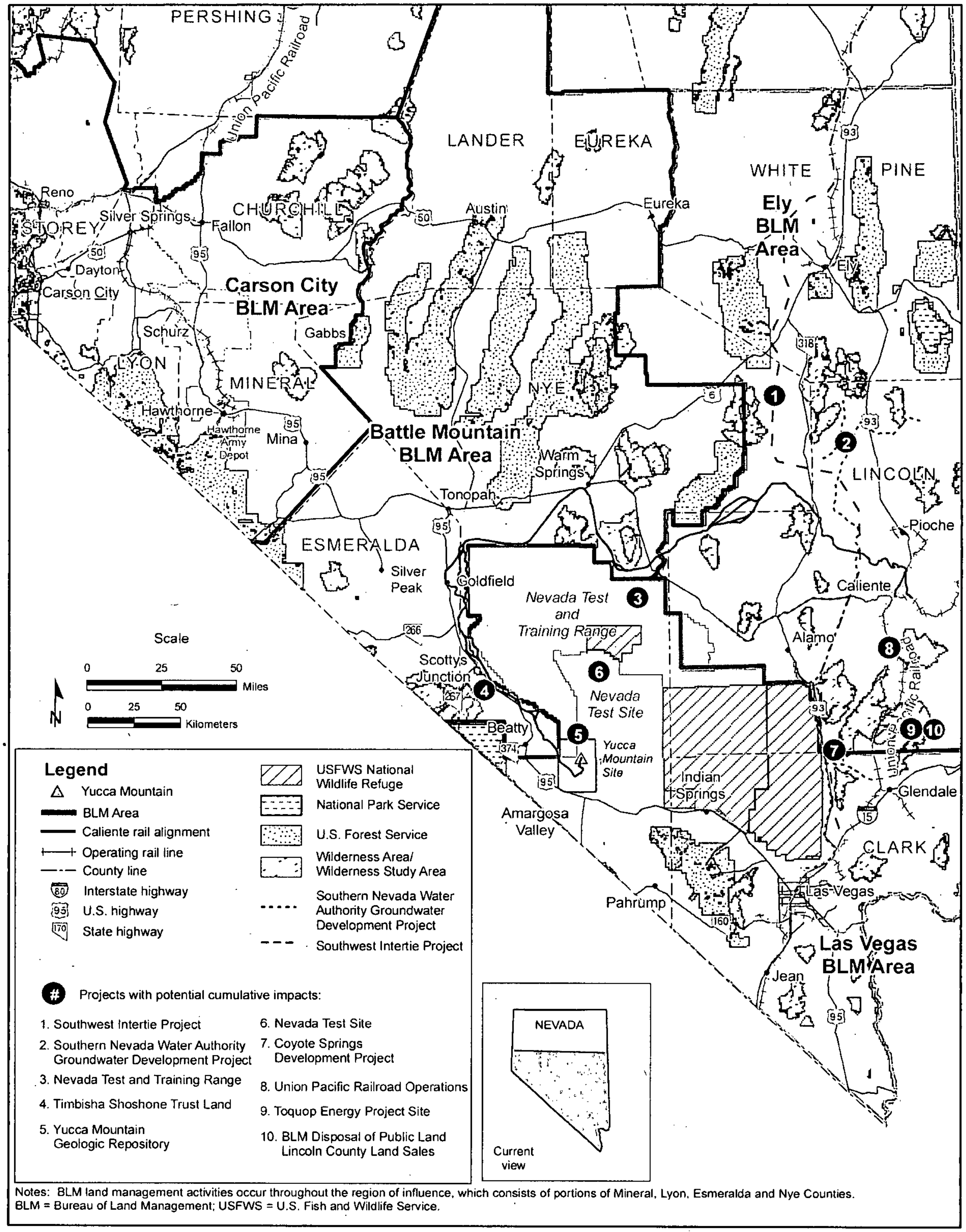

Figure 5-1. Major reasonably foreseeable future actions and continuing activities in the Caliente rail alignment cumulative impacts region of influence.

5.2.1 PROJECTS AND ACTIVITIES INCLUDED IN THE CUMULATIVE IMPACTS ANALYSIS – CALIENTE RAIL ALIGNMENT

5.2.1.1 Past and Present Actions

The descriptions of existing (baseline) environmental conditions (Chapter 3) and impacts (Chapter 4) associated with the various environmental resource regions of influence for the Caliente rail alignment considered in this Rail Alignment EIS include the relationships between proposed railroad construction, operation, abandonment, and past and present actions such as:

- Operations at major federal facilities such as the Yucca Mountain Geologic Repository, Nevada Test and Training Range, and Nevada Test Site
- BLM resource management planning and land management uses
- Traditional land uses such as regional ranching, mining, and recreation
- Military operations
- Residential, commercial, and industrial development activities associated with growth in the Caliente rail alignment cumulative impacts region of influence

Reasonably foreseeable future actions and the continuation of existing actions in the Caliente rail alignment cumulative impacts region of influence were also considered. Figure 5-1 shows the locations of individual projects and activities.

5.2.1.2 Reasonably Foreseeable Future and Continuing Federal Actions

Sections 5.2.1.2.1 through 5.2.1.2.6 describe reasonably foreseeable future and continuing federal agency actions that could result in cumulative impacts when combined with the potential impacts of constructing and operating the proposed railroad along the Caliente rail alignment.

5.2.1.2.1 Yucca Mountain Geologic Repository

The Proposed Action in this Rail Alignment EIS is directly related to the proposed geologic repository at Yucca Mountain, which is a reasonably foreseeable project that would have potential cumulative impacts in the Caliente rail alignment region of influence (see Figure 5-1, Project #5). In the Yucca Mountain FEIS (DIRS 155970-DOE 2002, all) and the *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (the Repository SEIS; DOE/EIS-0250F-S1 DOE proposes to construct, operate and monitor, and eventually close a ***geologic repository*** for the ***disposal*** of 70,000 metric tons (77,000 tons) of heavy metal of ***spent nuclear fuel*** and ***high-level radioactive waste*** at Yucca Mountain in Nye County, Nevada. DOE proposed to dispose of spent nuclear fuel and high-level radioactive waste in the repository using the natural geologic features of the mountain and engineered barriers as a total system to help ensure long-term ***isolation*** of the materials from the accessible environment. As analyzed in the Repository SEIS, the repository design and associated construction and operation plans require the following:

- DOE spent nuclear fuel and high-level radioactive waste would be placed in disposable canisters at the DOE sites, and as much as 90 percent of the commercial spent nuclear fuel would be placed in ***transportation, aging, and disposal*** (TAD) canisters at the commercial sites prior to shipment. This is the preferred method of receipt. The remaining commercial spent nuclear fuel (about 10 percent) would be transported to the repository in ***dual-purpose canisters*** (canisters suitable for storage and transportation), or would be uncanistered.

- Most spent nuclear fuel and high-level radioactive waste would be transported from 72 commercial and four DOE sites to the repository in Nuclear Regulatory Commission-certified transportation casks placed on trains dedicated only to these shipments. Some shipments, however, would be transported to the repository by truck over the Nation's highways.
- At the repository, DOE would conduct waste handling activities to manage thermal output of the commercial spent nuclear fuel and to package the spent nuclear fuel into TAD canisters. The disposable canisters and TAD canisters would be placed into ***waste packages*** for disposal in the repository. A waste package is a container that consists of the barrier materials and internal components in which DOE would place the canisters that contained spent nuclear fuel and high-level radioactive waste.
- DOE would place approximately 11,000 waste packages, containing no more than a total of 70,000 metric tons (77,000 tons) of heavy metal, spent nuclear fuel, and high-level radioactive waste in the repository at Yucca Mountain.
- When authorized by the Nuclear Regulatory Commission, the repository would be closed permanently. The design for construction would allow for phased construction of the surface and subsurface facilities that would be compatible with constrained funding.
- The surface and subsurface facilities and associated infrastructure, such as the onsite road and water distribution networks and emergency response facilities, would be constructed in phases to accommodate the expected receipt rates of spent nuclear fuel and high-level radioactive waste.
- DOE also would construct a four-lane access road that would extend from U.S. Highway 95 to the existing access road at Gate 510. This access road might be constructed using a phased approach, with initial construction of two lanes, and the road being widened later. The Department would also build a suitable intersection at U.S. Highway 95.
- DOE assumes that the following facilities would be constructed outside the repository land withdrawal area: a training facility near Yucca Mountain to support the Project Prototype Testing and the Operator Training and Qualification programs; temporary accommodations for construction workers; a proposed Sample Management Facility to consolidate, upgrade, and improve storage and warehousing for scientific samples and materials, perhaps near the Town of Amargosa Valley; and a marshalling yard and warehouse, a proposed leased facility that would consolidate material shipment and receipt into a 0.2-square-kilometer (50-acre) facility to allow for off-site receipt, transfer, and staging of materials required to perform construction activities at the Yucca Mountain site.

The Nuclear Regulatory Commission, through its licensing process, would regulate repository construction, operation and monitoring, and closure. Repository operations would only begin after the Commission granted DOE a license to receive and possess spent nuclear fuel and high-level radioactive waste. DOE is currently preparing an application for construction authorization.

The Yucca Mountain FEIS and the Repository SEIS evaluate the cumulative impacts of two additional inventories (Modules 1 and 2), which include spent nuclear fuel and high-level radioactive waste in addition to that of the Proposed Action inventory, and other radioactive wastes generally considered unsuitable for near-surface disposal. Inventory Module 1 or 2 could have cumulative impacts on the operation of the proposed railroad. Regarding potential cumulative impacts from Inventory Module 1 or 2, there would be no cumulative construction impacts because the need for a new railroad would not change; that is, whichever rail alignment DOE selected in which to build the proposed railroad to serve the Yucca Mountain FEIS Proposed Action would also serve Module 1 or 2. In addition, because the planned annual shipment rate of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository would be about the same for Module 1 or 2 and the FEIS Proposed Action, the only cumulative operations impacts would result because of the annual increase of shipments for Module 1 or 2. Because Modules 1 and 2 exceed the NWPA disposal limit of 70,000 metric tons (77,000 tons) of heavy metal considered in the Repository SEIS, the emplacement of any such waste at Yucca Mountain would require legislative action by Congress unless a second licensed repository was in operation. The 70,000 metric tons of heavy metal limit is comprised of 63,000 metric tons (69,000 tons) of heavy metal from commercial utilities and 7,000 metric tons (7,000 tons) of heavy metal from DOE.

DOE is preparing the *Disposal of Greater-Than-Class-C Low-Level Radioactive Waste Environmental Impact Statement* (DOE/EIS-0375) (72 *FR* 40135, July 23, 2007). That EIS will address the disposal of wastes with concentrations greater than Class C, as defined in U.S. Nuclear Regulatory Commission regulations at 10 CFR Part 61, and DOE Low-Level Radioactive Waste and ***transuranic*** waste having characteristics similar to Greater-Than-Class-C waste and that otherwise do not have a path to disposal. DOE proposes to evaluate alternatives for Greater-Than-Class-C low-level waste disposal in a geologic repository; in intermediate depth boreholes; and in enhanced near surface facilities. Candidate locations for these disposal facilities are the Idaho National Laboratory; the Los Alamos National Laboratory and Waste Isolation Pilot Plant in New Mexico; the Nevada Test Site and the proposed Yucca Mountain Repository; the Savannah River Site in South Carolina; the Oak Ridge Reservation in Tennessee; and the Hanford Site in Washington. DOE will also evaluate disposal at generic commercial facilities in arid and humid locations. The Draft Yucca Mountain SEIS evaluates the potential cumulative impacts of disposal of these wastes at Yucca Mountain as a reasonably foreseeable action, which are included in Inventory Module 2. Current repository design plans do not accommodate disposal of Greater-Than-Class-C low-level radioactive waste.

DOE is preparing the *Programmatic Environmental Impact Statement for the Global Nuclear Energy Partnership* (DOE/EIS-0396). Global Nuclear Energy Partnership (GNEP) would encourage expansion of domestic and international nuclear energy production while reducing nuclear proliferation risks, and reduce the volume, thermal output, and ***radiotoxicity*** of spent nuclear fuel before disposal in a geologic repository. DOE anticipates that its Programmatic EIS will evaluate a range of alternatives, including a proposal to recycle spent nuclear fuel and separate many of the high-heat ***fission products*** and the uranium and transuranic components. The full implementation of GNEP would involve the construction and operation of advanced reactors, which would be designed to generate energy while destroying the transuranic elements. DOE also anticipates evaluating project-specific proposals to construct and operate an advanced fuel-cycle research facility at one or more DOE sites.

The United States uses a "once through" fuel cycle in which a nuclear power reactor uses nuclear fuel only once, and then the utility places the spent nuclear fuel in storage while awaiting disposal. GNEP would establish a fuel cycle where the uranium and transuranic materials would be separated from the spent nuclear fuel and reused in thermal and/or advanced nuclear reactors. GNEP would not diminish in any way the need for the nuclear waste disposal program at Yucca Mountain, because under any fuel recycle scenario, high-level radioactive waste will continue to be produced and require disposal.

DOE anticipates that by about 2020 the commercial utilities will have produced about 86,000 metric tons (95,000 tons) of heavy metal of spent nuclear fuel, which exceeds the DOE disposal limit of 63,000 metric tons (69,000 tons) of heavy metal of commercial spent nuclear fuel at the Yucca Mountain Repository. If DOE were to decide, in a GNEP Record of Decision, to proceed with its proposal to recycle spent nuclear fuel, the Department anticipates that the necessary facilities would not commence operations until 2020 or later. Although the spent nuclear fuel-recycling concept has not yet been implemented and the capacity of a separations facility has not been determined, one or more separations facilities could be designed with a total capacity sufficient to recycle the spent nuclear fuel discharged by commercial utilities. Consequently, the Department believes there would be no change in the spent nuclear fuel and high-level radioactive waste inventory, and therefore the number of casks of spent nuclear fuel and high-level radioactive waste shipped to the Yucca Mountain repository analyzed under the Proposed Action in this Rail Alignment EIS would remain unchanged (that is, the shipment of approximately 9,500 casks containing spent nuclear fuel and high-level radioactive waste).

Overall, development of a GNEP fuel cycle has the potential to decrease the amount (number of assemblies) of spent nuclear fuel that would require geologic disposal, but would increase the number of casks of high-level radioactive waste requiring disposal in a geologic repository in the long term. Consequently, recycling of commercial spent nuclear fuel could affect the nature of the inventory that represents the balance of Inventory Module 1 (that is, commercial spent nuclear fuel in amounts greater than 63,000 metric tons [69,000 tons] of heavy metal). Nevertheless, given the uncertainties inherent at this time in estimating the amount of spent nuclear fuel and high-level radioactive waste that would result from full or partial implementation of the GNEP closed fuel cycle, this Rail Alignment EIS analyzes rail transportation within Nevada of approximately 9,500 casks of spent nuclear fuel and high-level radioactive waste.

5.2.1.2.2 Nevada Test Site (Continuation of Activities)

The Nevada Test Site, adjacent to the Nevada Test and Training Range, engages in a number of defense-related material and management activities, waste management, environmental restoration, and non-defense research and development (see Figure 5-1, Project #6). The Nevada Test Site was established in 1951 as the Nation's proving ground for developing and testing nuclear weapons. The site is on land administratively held by the BLM, but the Nevada Test Site land was withdrawn for use by the Atomic Energy Commission and its successors (including DOE). At present, the DOE National Nuclear Security Administration manages the site. It consists of about 3,200 square kilometers (800,000 acres) of land.

The *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 101811-DOE 1996, all) described existing and projected future actions at the Nevada Test Site. That EIS was followed by a *Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 162638-DOE 2002, all). DOE activities at the Nevada Test Site include stockpile stewardship and management (helping ensure the U.S. nuclear weapon stockpile is safe, secure, and reliable), materials disposition (removal of nuclear materials in a safe and timely manner), and nuclear emergency response. Activities at the Nevada Test Site since the 1996 EIS and 2002 supplement analysis have continued to support these missions in accordance with federal law, DOE policies and missions, and NEPA requirements. There are a number of other programmatic DOE waste management initiatives that can affect current and potential future operations at the Nevada Test Site, many of which require NEPA analyses. The Nevada Test Site also produces annual environmental reports that describe program activities and related environmental issues and activities.

DOE is currently preparing the *Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement–Complex 2030* (Complex Transformation Supplemental PEIS [formerly known as the Complex 2030 SEIS]; DOE/EIS-0236-S4). That SEIS will analyze the environmental impacts of the continued transformation of the United States nuclear weapons complex by implementing the National Nuclear Security Administration's vision of the complex as it would exist in 2030, and alternatives to that action. Part of the proposed action in that SEIS is to identify one or more sites for conducting National Nuclear Security Administration flight test operations. Existing Department of Defense and DOE test ranges (for example, the White Sands Missile Range in New Mexico and the Nevada Test Site in Nevada) would be considered as alternatives to the continued operation of the Tonopah Test Range in Nevada.

Another part of the proposed action in the Complex Transformation Supplemental PEIS is to accelerate dismantlement activities. The DOE sites that will be considered as potential locations for the consolidated plutonium centers and consolidation of Category I (high strategic significance) and II (moderate strategic significance) special nuclear materials include Los Alamos National Laboratory, the Nevada Test Site, the Pantex Plant, the Y-12 National Security Complex, and the Savannah River Site.

DOE manages several types of radioactive and hazardous waste (***low-level radioactive waste***, ***mixed low-level waste*** [referred to as mixed waste], transuranic waste, high-level radioactive waste, and ***hazardous waste***) generated by past and present nuclear defense research activities at many DOE sites across the United States, including the Nevada Test Site. The Department manages each of those waste types separately because they have different components, levels of radioactivity, and regulatory requirements. DOE needs facilities like the Nevada Test Site to manage its radioactive and hazardous wastes to maintain safe, efficient, and cost-effective control of these wastes; comply with applicable federal and state laws; and protect public health and safety and the environment. In *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DIRS 101816-DOE 1997, all) DOE evaluated the environmental impacts of managing the five waste types. The Nevada Test Site will continue to be a major facility involved in DOE waste management programs, including serving as a disposal site for certain waste types generated off the site, and for on-site wastes primarily from environmental restoration and remediation activities.

The Nevada Test Site is a candidate disposal location for Greater-Than-Class-C Low-Level Radioactive Waste which is currently being examined in the *Disposal of Greater-Than-Class-C Low-Level Radioactive* Waste *Environmental Impact Statement* (DOE/EIS-0375). That DOE EIS will address the disposal of wastes with concentrations greater than Class C, as defined in Nuclear Regulatory Commission regulations at 10 CFR Part 61, and DOE low-level radioactive waste and transuranic waste having characteristics similar to Greater-Than-Class-C low-level waste and that might not have an identified path to disposal. DOE proposes to evaluate alternatives for Greater-Than-Class-C low level waste disposal in a geologic repository; in intermediate-depth boreholes; and in enhanced near-surface facilities.

Table 5-1 lists and briefly describes recent environmental assessments that describe Nevada Test Site operations.

Table 5-1. Recent environmental assessments describing Nevada Test Site operations.

Title	Description
Environmental Assessment for Relocation of Technical Area 18 capabilities and materials from the Los Alamos National Laboratory to the Nevada Test Site (DIRS 162639-DOE 2002, all)	DOE completed relocation of Technical Area 18 operational capabilities and materials from the Los Alamos National Laboratory to the Nevada Test Site in November 2005. Relocation included the transport of about 2.4 metric tons (2.6 tons) of special nuclear material and approximately 10 metric tons (11 tons) of natural and depleted uranium and thorium, as well as support equipment, some of which would have radioactive contamination, associated with the operations. A Finding of No Significant Impact was issued.
Environmental Assessment for Defense Logistics Agency Transfer of Waste to DOE and Finding of No Significant Impact (DIRS 172280-DLA 2003, all; DIRS 172281-DOD 2003, all)	The Defense Logistics Agency of the Department of Defense issued an environmental assessment of its proposal to transfer thorium nitrate from the Defense National Stockpile Center to DOE for disposal as a low-level radioactive waste at the Nevada Test Site. The Agency issued a Finding of No Significant Impact in November 2003 (DIRS 172281-DOD 2003, all). The Defense Logistics Agency made eight shipments of low-level thorium waste (about 310 cubic yards [10,800 cubic feet]) in 2004 (DIRS 182346-DOE 2005, all).

5.2.1.2.3 BLM Resource Planning and Management

The presence of BLM-administered public land is a very important factor affecting how and where activities occur within Caliente rail alignment regions of influence. Many private and federal projects, including the proposed ***railroad***, would involve use of BLM-administered public land. Therefore, these projects would require BLM-issued ***right-of-way grants*** before they could proceed. Right-of-way grants have two general forms: linear (applicable to such projects as transmission lines, railroads, and pipelines), and nonlinear (applicable to projects at one specific location). Rights-of-way on BLM-administered land are extensive in the region. These rights-of-way vary tremendously in size and scope of activity.

The BLM administers most of the land through which the Caliente rail alignment would pass. The BLM manages these lands through a multiple-use concept (which means managing public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people) in accordance with the Federal Lands Policy and Management Act of 1976 (43 U.S.C. 1732, *et seq.*) and other federal legislation. The management framework for each BLM planning area is documented in a resource management plan. The Caliente rail alignment would cross three BLM planning areas (Ely, Battle Mountain, and Las Vegas). The Battle Mountain and Las Vegas planning areas are operating under resource management plans adopted in 1998 and 1997, respectively (DIRS 176043-BLM 1998, all; DIRS 173224-BLM 1997, all). The Ely planning area is currently operating under terms of the Schell and Caliente Management Framework Plans approved in 1983 and 1981, respectively, and the Egan Resource Management Plan approved in 1987. The Caliente rail alignment would pass through areas outlined in the Schell and Caliente Management Framework Plan. The Ely Field Office issued a Draft Resource Management Plan in 2005 (DIRS 174518-BLM, 2005, all), which when finalized, will replace the existing plans within the Ely planning area. Because the Ely Resource Management Plan is still in draft form and has not yet been adopted by the BLM, the Schell, Caliente, and Egan land-use plans provide the basis for planning activities in the Ely planning area.

The BLM manages public lands in accordance with the existing management goals and objectives in applicable plans, and takes various specific actions on the affected public lands. There are many land uses on BLM-administered land in the region of influence; livestock grazing is a major use. The BLM activities to plan for and manage the public lands it administers have a major role in balancing competing needs and resources, and in determining the scope and locations of public and private activities on public lands.

5.2.1.2.4 BLM Disposal of Public Land – Lincoln County Land Sales

Based on the terms of federal legislation, the BLM is implementing the following laws that authorize disposing of (selling) public lands in southern Nevada (See Figure 5-1, Project #10). These land disposals are driven by two primary legislative initiatives, as follows:

- <u>Lincoln County Land Act of 2000</u> – This Act (Public Law 106-298) identified approximately 53square kilometers (13,000 acres) in the southeastern corner of Lincoln County near Mesquite, Nevada, for sale. In February 2005, the BLM sold this acreage to private interests for $47.5 million. Ten percent of the proceeds of this sale go to Lincoln County, and the remainder is earmarked for archaeological preservation and development of a multi-species habitat conservation plan in Lincoln County.
- <u>Lincoln County Conservation, Recreation and Development Act of 2004</u> – This Act (Public Law 108-424) provides for the sale of up to 360 square kilometers (90,000 acres) in Lincoln County.

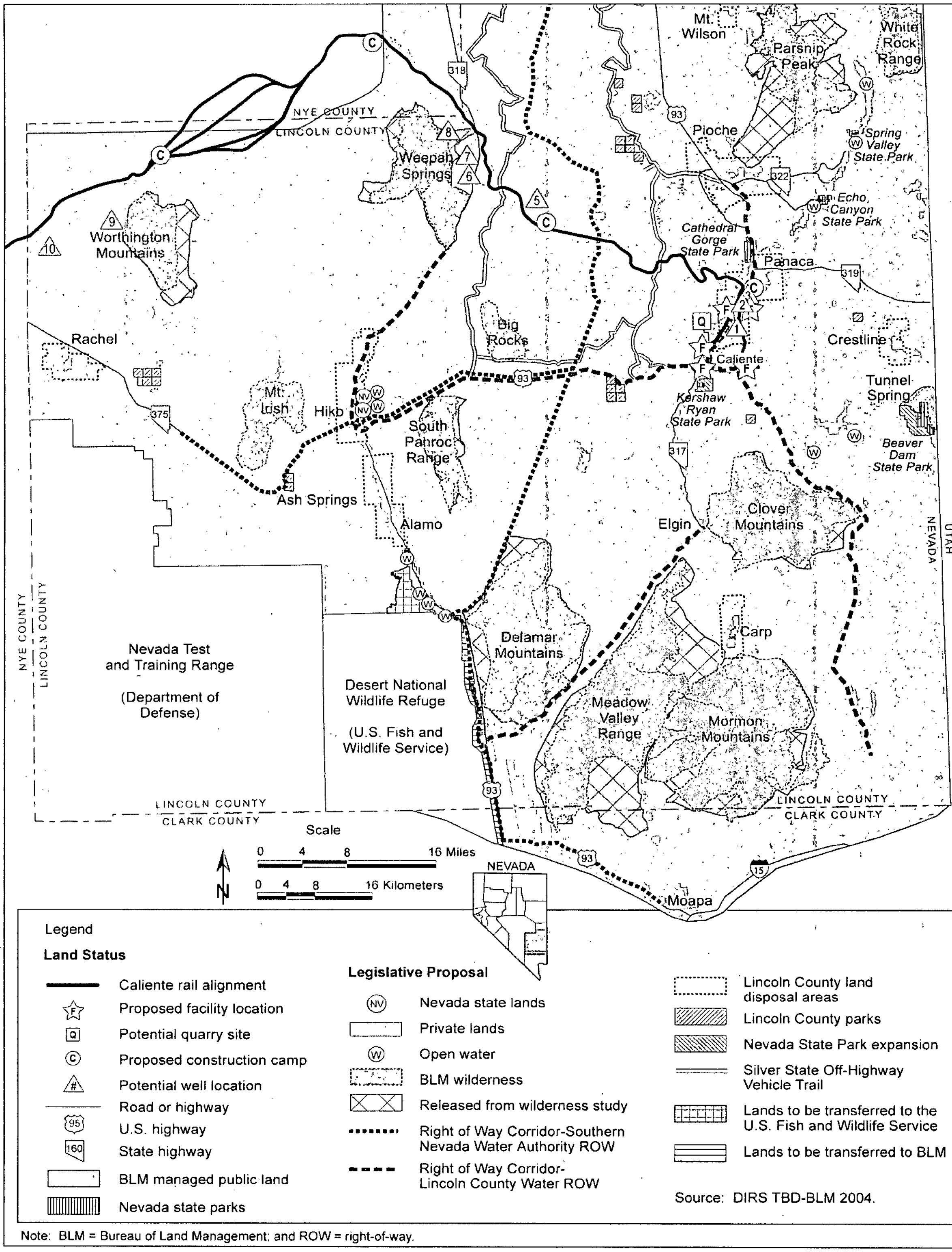

Figure 5-2. Lincoln County Conservation, Recreation, and Development Act activities.

The lands that would be eligible for sale will be identified in the Final Ely Resource Management Plan, which is currently being prepared by the BLM and is scheduled for completion in 2007. The Act will affect the growth and development in the Caliente rail alignment region of influence. See Figure 5-2 for the locations of activities and projects related to this Act. In addition to the planned BLM land disposals, the Act provides for:

- Designation of 14 new wilderness areas (consisting of 3,100 square kilometers [770,000 acres]) of BLM-administered land in Lincoln County, and release of 1,000 square kilometers (250,000 acres) of land from the BLM wilderness study area status.
- Establishment of nonexclusive utility corridors for the Southern Nevada Water Authority and the Lincoln County Water District/Vidler Water Company totaling 740 kilometers (460 miles) as rights-of-way for water pipelines and associated facilities to convey water in Clark and Lincoln Counties.
- Movement of an undeveloped right-of-way from the east side of U.S. Highway 93 to an existing utility corridor on the west side of the highway. Coyote Springs Investment will pay the Federal Government for the appreciated value of the property due to adding the right-of-way to their property.
- Establishment of a 420-kilometer (260-mile) Silver State Off-Highway Vehicle Trail along a series of existing backcountry roads that are currently open and used by off-highway vehicle enthusiasts, subject to the BLM preparation of a management plan for this trail.
- Transfer of about 35 square kilometers (8,500 acres) of BLM-administered land to the Desert National Wildlife Range, and transfer of about 34 square kilometers (8,400 acres) of Desert National Wildlife Range land to the BLM to facilitate the utility corridor for the Coyote Spring Investment development.
- Conveyance of up to 61 square kilometers (15,000 acres) of BLM-administered land to Lincoln County for conservation of natural resources or for public parks, with specific lands to be identified based on consultation between the county and the BLM.

In addition to the disposals required by the federal legislation described above, about 92 square kilometers (22,622 acres) have been identified for potential disposal in the vicinity of Goldfield, about 23 square kilometers (5,765 acres) have been identified for potential disposal near Scottys Junction, and 160 square kilometers (39,432 acres) have been identified for potential disposal near Beatty.

5.2.1.2.5 Nevada Test and Training Range (Continuation of Activities)

The U.S. Air Force operates the Nevada Test and Training Range in south-central Nevada (see Figure 5-1, Project #3), a national test and training facility for military equipment and personnel consisting of approximately 12 million square kilometers (3 million acres). Military training maneuvers and jet aircraft are commonly visible in the Caliente rail alignment cumulative impacts region of influence. In 2005, the U.S. Air Force designated the Indian Springs Air Force Auxiliary Airfield to Creech Air Force Base and expanded its mission and infrastructure to play a major role in the war on terrorism. The base is home to two key military operations: the MQ-1 unmanned aerial vehicle and the Unmanned Aerial Vehicle Battle laboratory.

The 1,600-square-kilometer (390,000-acre) BLM-administered National Wild Horse Management Area is within the boundary of the Nevada Test and Training Range. More than 3,200 square kilometers (800,000 acres) of the Nevada Test and Training Range comprise the Desert National Wildlife Range. The U.S. Air Force and the U.S. Fish and Wildlife Service jointly manage this area.

In *Renewal of the Nellis Air Force Range Land Withdrawal: Legislative Environmental Impact Statement* (DIRS 103472-USAF 1999, all) the U.S. Air Force addressed potential environmental consequences of extending the land withdrawal in order to continue using the Nevada Test and Training Range lands for military use. Activities at the Nevada Test and Training Range change, as necessary, to meet military test and training needs.

In 2004, the BLM prepared a resource management plan for about 8,900 square kilometers (2.2 million acres) of withdrawn public lands within the Nevada Test and Training Range (DIRS 178102-BLM 2004, all). The plan guides the management of the affected Nevada Test and Training Range natural resources 20 years into the future (2024). The decisions, directions, allocations, and guidelines in the plan are based on the primary use of the withdrawn area for military training and testing purposes.

Table 5-2 lists and briefly describes recent environmental assessments that describe Nevada Test and Training Range operations.

Table 5-2. Recent environmental assessments describing Nevada Test and Training Range operations.

Title	Description
Final Environmental Assessment for Increased Depleted Uranium Use on Target 63-10, Nevada Test and Training Range (DIRS 181607-USAF 2006, all)	The proposed action was to increase the use of depleted uranium ammunition at the Nevada Test and Training Range to meet ongoing test and training requirements for A-10 aircraft. The Air Force was to increase the number of depleted uranium rounds authorized to be fired on Target 63-10 from 7,900 to 19,000 annually. The environmental assessment evaluated five resource areas—air quality, soils and water resources, health and safety, hazardous and radioactive materials and waste, and biological resources—in detail to identify potential environmental consequences. The Air Force issued a Finding of No Significant Impact.
Final Environmental Assessment for Predator Force Structure Changes at Indian Springs Air Force Auxiliary Field, Nevada (DIRS 172314-USAF 2003, all)	The proposed action included changes to personnel assignments, upgrades to existing facilities, construction of new facilities, and extension of a runway by 120 meters (400 feet). The Air Force completed facilities for the Predator unmanned aerial vehicles in 2006. The Air Force issued a Finding of No Significant Impact.
Expeditionary Readiness Training Course Expansion, Final Environmental Assessment, Creech AFB (DIRS 182838-USAF 2006, all)	Environmental assessment to increase the number of Security Forces personnel trained at the Regional Training Center at Silver Flag Alpha and Creech AFB, Nevada, from an existing 2,520 to 6,000 students per year. The Air Force issued a Finding of No Significant Impact.
Wing Infrastructure Development Outlook, Final Environmental Assessment, Nellis AFB (DIRS 182839-USAF 2006, all)	The proposed action consists of 630 Wing Infrastructure and Development Outlook projects in 11 categories as classified under 32 CFR Part 989, *Air Force EIAP*. A total of 18 new construction and demolition projects are proposed for Creech Air Force Base. On the Nevada Test and Training Range, the proposed action would implement four new construction projects at four locations. At Tonopah Test Range, three new construction projects are planned along with the demolition of 10 buildings. The Air Force issued a Finding of No Significant Impact.
Draft Range 74 Target Complexes Environmental Assessment Nevada Test and Training Range, Nevada (DIRS 182840-USAF 2007, all)	The proposed action is to construct and operate three target complexes in mountainous terrain in Range 74 of the Nevada Test and Training Range at Saucer Mesa, Limestone Ridge, and Cliff Springs. The Saucer Mesa target array would employ both large-scale live and inert munitions; the Limestone Ridge sites would employ large-scale inert munitions; both target sites would employ small-scale live munitions. The Cliff Springs target complex would be laser and simulated attack targets and no munitions would be used. The Air Force issued a Finding of No Significant Impact.
A Final Base Realignment and Closure Environmental Assessment for Realignment of Nellis Air Force Base (DIRS 181492-USAF 2007, all)	The proposed action would affect the Nevada Test and Training Range by adding 1,400 F-16 sorties flown from Nellis Air Force Base, although they would not cause total annual sortie operations to exceed the current maximum of 300,000 at the Nevada Test and Training Range. The environmental assessment evaluated noise, air quality, socioeconomics and infrastructure, water and soil resources, biological resources, cultural resources, and hazardous materials and waste. The Air Force issued a Finding of No Significant Impact.

5.2.1.2.6 Timbisha Shoshone Trust Land (Federal Action)

The Secretary of the Interior issued a draft report to Congress (DIRS 103470-Timbisha Shoshone Tribe [n.d.], all) describing a plan to establish trust lands for people of the Timbisha Shoshone Tribe in portions of the Mojave Desert in eastern California and southwestern Nevada (see Figure 5-1, Project #4). On November 1, 2000, the President signed the Timbisha Shoshone Homeland Act (Public Law 106-423) to provide a permanent land base for the Timbisha Shoshone Tribe within its ancestral homeland in five separate parcels. Lands in the designated area for tribal purposes were then identified, including land parcels containing water rights. The parcel near Scottys Junction (about 11 square kilometers [2,800 acres]) is approximately 3.2 kilometers (2 miles) from the proposed Caliente rail alignment. The Timbisha Shoshone Tribe is actively evaluating economic development opportunities on this Scottys Junction parcel. The locations and nature of these future development opportunities are not known and are not considered to be reasonably foreseeable for the purpose of this analysis.

5.2.1.3 Reasonably Foreseeable Future Non-Federal Actions

Non-federal and private actions in the Caliente rail alignment region of influence primarily consist of energy development, infrastructure development, groundwater development projects, continued Union Pacific railroad operations, residential development, and general economic development initiatives and efforts. As noted above, many of these privately sponsored projects would interact with the BLM land management policies and procedures because of a need to acquire right-of-way grants to initiate proposed activities on BLM-administered land.

5.2.1.3.1 Power Plants, Transmission Lines, Pipelines, and Other Infrastructure

Various power companies and public utilities have proposed locations for new power plants in southern Nevada due to substantial population and economic growth in southern California, Arizona, and southern Nevada. Much of this recent and proposed development is in Clark County. In addition to the power plants, regional infrastructure developments include natural gas pipelines and transmission lines that provide fuel and transmit electricity. Recently completed projects or reasonably foreseeable projects that could result in cumulative impacts near the proposed Caliente rail alignment and associated facilities are listed below. It is likely that other power plants, transmission lines, pipelines, and other infrastructure would be built in the proposed Caliente rail alignment region of influence in the future, but the locations and timing of other future projects are not known at this time. Additionally, the region holds the potential for wind, solar, and geothermal energy development, although the magnitude and specific locations of these energy development projects are not known.

- <u>Southwest Intertie Project</u> (see Figure 5-1, Project #1) – LS Power Associates acquired the right-of-way, which is approximately 870 kilometers (540 miles) long, originally granted by the BLM in 1994 for a transmission line that would run from near Twin Falls, Idaho, to the Dry Lake Valley northeast of Las Vegas. The power line would connect the Nevada Power Company and Sierra Pacific Power Company electrical generation and transmissions systems.
- <u>Toquop Energy Power Project</u> (see Figure 5-1, Project #9) – This proposed power plant would be near Mesquite in Lincoln County, about 160 kilometers (100 miles) northeast of Las Vegas, on BLM-administered lands. In September 2003, the BLM issued to the proponent, Toquop Energy, Inc., a right-of-way to build the proposed 1,100-megawatt natural-gas fired power plant and associated facilities. However, since then, the project plan has changed to a 750-megawatt coal-fired power plant, in the same location as originally proposed. The BLM has determined that the proposed changes warrant the preparation of a new NEPA analysis and has initiated an environmental impact statement on the revised project concept (71 *FR* 8869, February 21, 2006).

In addition to the power plant itself, the project would require an approximate 50-kilometer (30-mile) rail spur, transmission lines, water, and a new access road.

- Various utilities in the Caliente rail alignment cumulative impacts region of influence have recently been constructed and are being planned, including new cable lines (for example, fiber optic lines) and other facilities (such as wireless towers) that would require BLM right-of-way grants or use of private land in the area. The BLM has designated certain corridors in the area that should be used for most utility purposes; however, use of other BLM-administered land requiring new right-of-way grants has traditionally been considered on a case-by-case basis. To identify appropriate right-of-way corridors throughout the western United States, including Nevada, DOE and the BLM are preparing a programmatic EIS (*Designation of Energy Corridors on Federal Land in the 11 Western States*; 70 *FR* 56647, September 28, 2005). This effort could include changes to the rights-of-way in the Caliente rail alignment cumulative impacts region of influence in future years but any such changes are unknown at this time.

5.2.1.3.2 Groundwater Development Projects

As part of its effort to augment future water supplies, the Southern Nevada Water Authority has initiated plans to develop groundwater for which it holds rights and applications in Clark, Lincoln, and White Pine Counties (see Figure 5-1, Project #2). The groundwater proposed for development involves seven hydrographic areas. These hydrographic areas generally lie along the east side of the state from an area north of the Las Vegas Valley, north into Lincoln County, and then extending into White Pine County. One of the hydrographic areas involved in the plan is hydrographic area 181 (Dry Lake Valley), which is west of the City of Caliente. The proposed Caliente rail alignment would pass through hydrographic area 181. The proposed project would develop and convey about 250 million cubic meters (204,000 acre-feet) per year of groundwater through a series of water wells, pipelines, and other infrastructure. The groundwater planned for development includes both existing and future permitted water rights, as permitted by the Nevada State Engineer. Of the total annual water planned for development, the Southern Nevada Water Authority would produce about 210 million cubic meters (170,000 acre-feet) per year for use by its purveyor members in the Las Vegas Valley, and about 44 million cubic meters (36,000 acre-feet) per year for conveyance to the Lincoln County Water District under terms of a February 2006 cooperative agreement between the two entities (DIRS 178053-Southern Nevada Water Authority 2006, all). The project would also involve electricity substations, transmission lines, pumping stations, a water storage facility, and a water treatment facility.

Final locations for individual well fields, and the number of wells in each valley, have not yet been determined, but preliminary exploratory areas have been identified, and water rights applications have been submitted for some proposed new wells at some specific locations (described below) that could lie within the region of influence used for groundwater resources as determined through the impacts analysis. In August 2004, the Southern Nevada Water Authority filed an application with the BLM to obtain necessary rights-of-way for the proposed system of regional water supply facilities associated with the project. The BLM has begun development of an EIS (70 *FR* 18043, April 8, 2005) to identify and disclose the environmental effects associated with this project. Scoping for the project was originally conducted in 2005; however, because of refinements in project plans, scoping for the project was reopened in July 2006.

As described in Section 3.2.6.2, applications have been filed for a proposed irrigation well that would be within approximately 1.7 kilometers (1.1 miles) of a DOE-proposed well location in Dry Lake Valley (hydrographic area 181), and an application has been filed for a proposed municipal well that would be located within approximately 1.7 kilometers of a DOE-proposed new well location in Pahroc Valley (hydrographic area 208). Each application gives 5 years as the minimum time period required for the construction of works and an estimated time required to complete the application of water to beneficial use of 10 years, as of the date the application was submitted (either December 1998 or October 2005). Applications have also been submitted for proposed municipal wells that would be approximately 1.5 kilometers (0.9 mile) northeast of another DOE-proposed new well location in area hydrographic 208, and approximately 1 kilometer (0.6 mile) northeast of another DOE-proposed well location in hydrographic area 208, respectively (Section 3.2.6.2). Both applications are under request-for-proposal status and according to the applications, the minimum time for construction of works (pumping station, pipelines, reservoirs, and distribution system) is 20 years for each proposed well. Section 5.2.2.6 evaluates the potential for cumulative impacts if these proposed well applications were to be approved and the wells installed and pumped contemporaneously with the DOE-proposed groundwater withdrawals.

The Lincoln County Land Act Groundwater Development and Utility Right of Way Project would include a projected 8 production water wells in the Tule Desert hydrographic basin and up to 10 production water wells in the Clover Valley hydrographic basin, cumulatively producing over 28 million cubic meters (23,000 acre-feet) of groundwater per year. A system of pipelines would collect the pumped water for conveyance through a main transmission pipeline southeast to the Lincoln County Land Act development area near Mesquite. Associated facilities would include power distribution and transmission and communications lines to be placed in the utility right-of-way to provide power and communication for the project facilities. A natural gas pipeline would parallel the water pipeline from the existing Kern River Natural Gas pipeline. The BLM initiated an EIS on this project (71 *FR* 16340, March 31, 2006) to evaluate potential impacts associated with this project.

As described in Section 3.2.6.3.3 of this Rail Alignment EIS, an application has been filed for a proposed municipal well that would be approximately 1.2 kilometers (0.8 mile) southwest of a DOE-proposed new well location in Garden Valley (hydrographic area 172). The municipal well would have a proposed production rate of up to 10,200 liters (2,690 gallons) per minute and would operate year round. The application lists an estimated time to construct this new well of 5 years and lists the estimated time required to complete the application of water to beneficial use as 10 years, as of the date the application was submitted (October 2005). The current status of this well is listed by the Nevada Division of Water Resources as "Ready for Action." Section 5.2.2.6 evaluates the potential for cumulative impacts if these proposed well applications were to be approved and the wells installed and pumped contemporaneously with the DOE-proposed groundwater withdrawals.

The Kane Springs Valley Groundwater Development Project would consist of up to seven water production wells along Kane Springs Road north of the Coyote Springs development site. The project is being proposed by the Lincoln County Water District, and would result in the groundwater withdrawal of about 6.17 million cubic meters (5,000 acre-feet) of groundwater per year. Ancillary facilities would include lateral pipelines, power distribution and communications lines, and access roads. The BLM initiated an EIS on this project to evaluate potential impacts associated with this project (71 *FR* 16340, March 31, 2006).

As with the other BLM EIS processes under way, BLM could not issue the necessary right-of-way grants for any of the water development projects, and the projects could not be initiated, until the EIS process was complete and the BLM decision was to allow the developments. In addition, the Nevada State Engineer must approve any proposed water production and grant approval for the use of groundwater for any project in Nevada (Nevada Revised Statutes, Chapters 532 through 538). The proposed rights-of-way for the proposed groundwater development projects are all based on terms of the Lincoln County Conservation, Recreation and Development Act of 2004 (see Section 5.2.2.6).

5.2.1.3.3 Union Pacific Railroad Operations

Under the Caliente Implementing Alternative evaluated in this Rail Alignment EIS, rail transportation of spent nuclear fuel and high-level radioactive waste would originate in or near the City of Caliente from the Union Pacific Railroad mainline track (see Figure 5-1, Project #8). The existing relevant portion of the Union Pacific Railroad track enters Nevada from Utah, with the track generally trending southwest into the Caliente area. From Caliente, the track continues southwest into Las Vegas. Union Pacific Railroad operations are well established in the area, and as of 2005, approximately 25 trains pass through Caliente each day on the Union Pacific Railroad track.

5.2.1.3.4 Coyote Springs Development Project

As outlined in Section 5.2.1.2.4, the BLM sold approximately 53 square kilometers (13,000 acres) of land in Lincoln County to a private entity, Coyote Springs Investment, LLC, which is in the process of turning the land into a housing development. The Coyote Springs Development Project would be a planned community about 80 kilometers (50 miles) north of Las Vegas (see Figure 5-1, Project #7). The planned development area consists of about 170 square kilometers (43,000 acres) in the Coyote Spring Valley. About one-third of the land held by Coyote Springs Investment, LLC, is in Clark County and two-thirds is in Lincoln County. As envisioned, the community would consist of a series of neighborhoods and villages located among open space corridors. Initially, the community focus would be on second-home development and development of a destination resort concept centering on golf courses. Over time, there would be more traditional community development, with ultimate development occurring over 40 years. Development would begin in the Clark County portion of the land, with plans for about 47,500 residential units, together with commercial and recreational facilities. The BLM stated that public services such as water, roads, law enforcement, emergency services, sewer, and power, must be established before home construction could begin on the land. Water for the potential new housing developments on the land might come from the Tule Springs area of Lincoln County. In addition, a new road from Caliente to Mesquite might be built to provide additional land access to these areas. The road would be about 130 kilometers (80 miles) long with a 30-meter (100-foot)-wide construction right-of-way. Coyote Springs Development, LLC, has not yet obtained water rights to provide for full build-out, and this could be a limiting factor for the development.

5.2.1.3.5 Other Regional Economic Development

Cumulative impacts issues associated with regional economic development actions include socioeconomic effects and overall growth in the region of influence. All of the counties and cities in the Caliente rail alignment region of influence have expressed a desire for economic development. The Lincoln County government is preparing for extensive growth (for example, Coyote Springs and population growth through BLM land disposals) with expansion of the county planning department, development of a Strategic Tourism Plan, and refinement of economic development strategies. Examples of Lincoln County economic development include the Meadow Valley Industrial Park and the Alamo Industrial Park (that would use land obtained through a BLM land disposal).

Nye and Esmeralda Counties also are pursuing growth and development opportunities. Economic development plans and tourism enhancement concepts have also been developed in those areas. Pahrump will continue to grow and urbanize with its proximity to Las Vegas. A perceived need for support to the Nevada Test Site has led to designation of the Nevada Science and Technology Corridor by the Economic Development Authority for Nye County. The Science and Technology Corridor extends from Indian Springs in Clark County in the south to Tonopah in the north, passing through the Pahrump Valley, Mercury (entrance to the Nevada Test Site), Amargosa Valley, Beatty and Goldfield, with industrial park and technology initiatives associated with the Tonopah Aeronautics and Technology Park, the Nevada Science and Technology Park in Amargosa Valley, and the Pahrump Center for Technology Training and

Development. The continuing BLM land sales and other development in the area indicate an increasing trend toward and desire for economic development, especially in Lincoln County. The locations and nature of specific future development opportunities are not known and are not considered to be reasonably foreseeable for the purpose of this analysis.

Nye County has completed a Yucca Mountain Project Gateway Area Concept Plan with proposed activities for the area around the entrance to the proposed repository site (DIRS 182345-Giampaoli 2007, all). This plan presents Nye County's conceptual, multi-phased land-use guidance for communities adjacent to and near the site entrance area. Nye County proposed this plan with the objective that land development occurs in an orderly and consistent manner and to increase opportunities for industrial and commercial development beneficial to the repository program. Nye County views this plan as a starting point for development of the infrastructure, institutional capacity, and facilities to support the proposed repository. The county developed the plan to use and manage existing initiatives while expanding and improving the area.

5.2.2 POTENTIAL CUMULATIVE IMPACTS – CALIENTE RAIL ALIGNMENT

Located in portions of Lincoln, Esmeralda, and Nye Counties, the Caliente rail alignment cumulative impacts region of influence covers millions of acres of land, most of which is BLM-administered public land. Most of the land in the Caliente rail alignment region of influence is undeveloped, although much of it has been affected by human activity such as ranching, mining, and recreation.

Potential cumulative impacts are often discussed herein within the context of the existing regulatory framework (primarily federal and state laws and regulations) and the BLM resource management planning goals and objectives. For example, the existing regulatory frameworks for water and air consider a regional and cumulative impacts perspective, in that regulatory decisions consider the potential effects from other projects and a proposed action. As the primary regional land manager, BLM planning and management actions consider the cumulative effects for many resources through stated planning goals and objectives, which often are based on quantitative criteria.

The following analysis of the cumulative impacts associated with the Caliente rail alignment is organized by resource area, with Sections 5.2.2.1 through 5.2.2.15 summarizing potential cumulative impacts in the same order of resource discussions in Chapter 4.

5.2.2.1 Physical Setting

5.2.2.1.1 Disturbance of Physical Resources

Physical resources consist of resources, conditions, and characteristics such as physiography, soils, and geology. As construction of any project in the area occurs, there would be a potential for changes to the physical setting because land would be disturbed through activities such as cuts and fills, and constructing new structures such as buildings and bridges. The proposed railroad would be one of many new sources of change to physical resources that would continue the trend of increasing land disturbance and modifications of the natural physical environment. In large-scale projects that involve substantial ground disturbance, natural features are considered in project design, construction, operations, and potential abandonment plans, which would tend to limit direct, indirect, and cumulative impacts. The proposed railroad would disturb only a small percentage of land in the Caliente rail alignment cumulative impacts region of influence.

Given the large amount of land potentially available for development of existing and reasonably foreseeable projects, and the small percentage of potentially available land required for the proposed railroad, overall cumulative impacts to physical setting in the Caliente rail alignment region of influence would be small.

5.2.2.1.2 Known or Potentially Contaminated Soils

The major sources of existing soil contamination in the Caliente rail alignment region of influence include mining and the Nevada Test Site. Mining activities in the region have occurred for many years, with mining wastes still remaining from older operations before the regulatory framework required waste management and clean-up. Nevada Test Site contamination has been described in recent NEPA documentation (DIRS 101811-DOE 1996, all; DIRS 162638-DOE 2002, all). Historic contamination of soils resources at the Nevada Test Site resulted primarily from radioactive-waste management sites and nuclear testing activities. Environmental restoration and remediation is occurring at contaminated Nevada Test Site locations in accordance with the facility's Environmental Restoration Program. For most of the contaminated soils within the Nevada Test Site boundary, DOE is planning a characterization and long-term monitoring program. Contaminated areas on the Nevada Test Site are generally defined and access is restricted for safety and security reasons. Spills of hazardous materials are possible from the projects described in this section; however, the current regulatory framework to manage and control hazardous materials and wastes ensures that actions are in place to minimize any impacts.

While any potential impacts associated with hazardous materials and wastes from current and future mining operations in the region are controlled through the existing regulatory framework, mining wastes from past mining extraction and processing activities, especially in the Goldfield area, remain a concern related to soil contamination.

The proposed railroad could result in very localized contamination of soils through occasional spills (such as fuel, oil, and solvents). However, such incidents would be minor in scope and quickly mitigated in accordance with plans and regulations. All existing and foreseeable projects would be subject to the same regulations. Cumulative impacts related to contamination of soils would likely be small.

5.2.2.2 Land Use and Ownership

5.2.2.2.1 Land Use Changes

Many of the past, present, and reasonably foreseeable future actions in the Caliente rail alignment region of influence result in land use changes. Changes in land uses can also alter land ownership, land management responsibilities, and preclude future activities from these areas. More than 97 percent of the land the proposed Caliente rail alignment and associated facilities would disturb is on BLM-administered land in Lincoln, Nye, and Esmeralda Counties. The BLM manages more than 55,700 square kilometers (13.7 million acres) in those three counties. One of the primary land uses in and around the proposed Caliente rail alignment on those BLM-administered lands is grazing. Regional grazing activities are often affected by BLM land management plans and activities.

Other existing and reasonably foreseeable major land uses in the Caliente rail alignment region of influence include:

- Yucca Mountain Repository – About 6.3 square kilometers (1,600 acres) of land disturbance, most of which would be on the Nevada Test Site (already withdrawn for Nevada Test Site activities).
- Nevada Test and Training Range – About 12,000 square kilometers (3 million acres) of land the U.S. Air Force has withdrawn for special-purpose use, with about 530 square kilometers (130,000 acres) of that land disturbed by Air Force tactical target complexes and associated infrastructure.

- Nevada Test Site – About 3,200 square kilometers (800,000 acres) of land DOE has withdrawn for special-purpose use (about 4.12 square kilometers [1,020 acres]) of this land would be used by the proposed Yucca Mountain railroad).
- Coyote Springs Development Project – About 170 square kilometers (43,000 acres) of land.
- Lincoln County Land Act of 2000 – Completed disposal of about 53 square kilometers (13,000 acres) of BLM-administered land.
- Lincoln County Conservation, Recreation, and Development Act of 2004 – Approved disposal of up to 360 square kilometers (90,000 acres) of BLM-administered land in Lincoln County (specific locations to be determined as part of the BLM Ely Resource Management Plan process; the Draft Ely Resource Management Plan (DIRS 174518-BLM 2005, all), includes alternatives and assessment for disposal of about 140 square kilometers (34,000 acres), with various linear rights-of-way of about 61 square kilometers (15,000 acres).
- Rights-of-way corridors that may be established when DOE and the BLM complete the Energy Corridor programmatic EIS (70 *FR* 56647, September 28, 2005).

The proposed Caliente rail alignment would disturb up to 165 square kilometers (40,000 acres) of BLM land, most of which would be within the construction right-of-way. Therefore, the proposed Caliente rail alignment would directly affect about 0.3 percent of the BLM-administered land in the three counties. This disturbance would include construction and operation of the proposed rail line, facilities, quarries, water wells, construction camps, and access roads. While the amount of disturbed land would be relatively small compared to the total amount of BLM-administered land, this disturbance could also result in indirect effects beyond the direct disturbance area.

Considering both the proposed railroad and existing and reasonably foreseeable land uses and land ownership, cumulative impacts from land-use changes would be small.

5.2.2.2.2 Existing or Potential Land-Use Conflicts

The Federal Government administers most of this land in the Caliente rail alignment cumulative impacts region of influence, with the BLM, DOE, and the U.S. Air Force acting as the major federal land managers. Private land holdings are small, and generally associated with the towns in the Caliente rail alignment region of influence. Traditional land uses in most of the Caliente rail alignment region of influence that would be directly and indirectly affected include grazing and wildlife management. Much of this land is not extensively disturbed, although it has been modified through activity such as grazing.

Over time, human activity in the area, while relatively minor, has begun to change the natural and traditional conditions, and land-use conflicts occasionally result from this human activity. The Nevada Test Site and Nevada Test and Training Range lands have been withdrawn for special purpose and use. Both of these areas are inaccessible to the general public and land use is that of "dominant use," in which the specific DOE and U.S. Air Force missions, respectively, for these lands have ultimate priority over all other potential land uses. However, around these primary regional land uses are other uses, including mineral development, recreation, urban development, and rights-of-way for various infrastructure. All of these activities and land uses result from a much more intensive land usage involving human activity.

BLM land management goals allow for management of the land for special purposes (protection of cultural resources, wilderness designations or study areas, protection of wildlife habitat, or visual resource management), but with increasing development in the Caliente rail alignment region of influence there are more occurrences of land-use conflicts. As noted in Chapter 4 of this Rail Alignment EIS, construction and operation of a railroad along the Caliente rail alignment would have potential direct and indirect conflicts with grazing uses, access to grazing infrastructure, access to mineral resources, recreational resources, other linear rights-of-way (for example, utility corridors), and wildlife movement patterns in some locations. Potential land-use conflicts resulting from a railroad along the Caliente rail alignment would be similar in scope to some of the other linear rights-of-way proposed in the region of influence (such as water pipelines and transmission lines) but more extensive in scope compared to many of the other projects, which are generally smaller on a linear scale or at a specific location. Even with the existing and reasonably foreseeable land-use changes, the region as a whole would continue its traditional ways, with grazing and wildlife habitat as major land uses, and cumulative impacts related to land-use conflicts would be small.

5.2.2.2.3 Energy and Mineral Development

Existing and potential future energy and mineral development occurs in various locations throughout the Caliente rail alignment cumulative impacts region of influence. In addition to the traditional energy and mineral development (primarily hard-rock mining, industrial mineral development, and limited oil and gas development), more recently, this development includes geothermal resources and wind energy. The BLM administers energy and mineral development on public lands. Today's energy development environment includes a mix of old and new, involving both non-renewable and renewable resource development. Wind-energy development on the BLM-administered lands could be one of the biggest changes in the future landscape, because wind-energy opportunities are growing and the BLM-administered land is valued for possible wind-energy locations. Depending on the number and size of each new proposed wind-energy site, land requirements for development of this resource could be substantial.

Because of the scope and extent of typical mining operations, mineral resources that become actual operating mines could result in environmental and land-use issues. Within the Caliente rail alignment region of influence, most mining and energy-development activities would occur on federal lands, and the BLM will have a major role in mitigating and monitoring potential effects through its mining and reclamation requirements, NEPA, and other elements of the regulatory framework. Mineral exploration will continue to occur in many parts of the Caliente rail alignment region of influence, and some level of conflict from mining exploration and development with other land uses could be unavoidable.

Any potential conflict of the proposed railroad with energy and mineral development would be small in scope and occur in localized areas, and the effects of any such conflicts would be mitigated through the existing regulatory framework and BLM policies and plans. All existing and foreseeable projects would be subject to regulatory requirements and BLM policies and plans related to energy and mineral development. Therefore, cumulative impacts resulting in land-use conflicts related to energy and mineral development along the Caliente rail alignment would be small.

5.2.2.2.4 BLM Land Sales and Other Disposals

The BLM has identified a number of land parcels in the Caliente rail alignment region of influence that have been or will be removed from government ownership and disposed of through auctions or agreements with local governments. These BLM land disposals will continue, and will either directly or indirectly, enhance the potential for growth and urbanization in the Caliente rail alignment region of influence, as the land is changed from generally undeveloped to private lands available for residential or other development, or to government lands available for utility corridors, airports, or parks.

In many cases, these BLM land disposals would result in permanent land-use changes. With private land at a premium in the area, private-sector developer interest in the BLM land disposals will likely continue. These changes in land use could cause increasing urbanization and economic development in the Caliente rail alignment cumulative impacts region of influence.

While the proposed railroad would operate within the regional context of BLM land disposal efforts and any related implications and effects, it would have no affect on, nor would it be affected by, BLM land disposal efforts.

5.2.2.2.5 Recreational Land Use

Public lands in the Caliente rail alignment region of influence provide a number of diverse recreation opportunities, and the BLM has designated certain lands as recreation management areas. Demand for recreation is increasing as more people move to and recreate in the Caliente rail alignment cumulative impacts region of influence. Dispersed recreation, the principal opportunities available within the Caliente rail alignment region of influence, requires a variety of sites but needs no special facilities. These opportunities include caving, photography, automobile touring, backpacking, bird watching, hunting, primitive camping, hiking, rock climbing, and competitive and non-competitive off-highway vehicle events. Water-based recreation in the Caliente rail alignment region of influence is extremely limited. Increased demand for off-highway vehicle use from the increasing regional population, including the Las Vegas area, has been noted and is expected to continue. Many areas of BLM-administered land in Clark County previously used for off-highway vehicle recreation have been closed, causing a shift in use into the BLM Ely District. As growth and development occur in the Caliente rail alignment cumulative impacts region of influence, recreational resources will continue to be in demand, but the potential for conflict with recreational resources also will increase. Recreational resource locations, quality, and availability will evolve as the Caliente rail alignment region of influence changes.

The Lincoln County Conservation, Recreation, and Development Act of 2004 (Public Law 108-424) included such recreation initiatives as the designation of wilderness areas and the Silver State Off-Highway Vehicle Trail. Table 5-3 lists the wilderness designations, and the amount of land designated as wilderness area in Lincoln County. The wilderness-area designations provide wilderness characteristics such as solitude, primitive conditions, and unconfined recreation in these areas. DOE has sited the proposed Caliente rail alignment to avoid wilderness areas.

Table 5-3. Lincoln County wilderness designations from Public Law 108-424.

Wilderness Area	Designated as wilderness (square kilometers)[a]
Weepah Springs	210
Worthington Mountains	130
Big Rock	57
Mt. Irish	130
South Pahroc Range	100

a. To convert square kilometers to square miles, multiply by 0.38610.

The BLM has a major role in recreation opportunities in the Caliente rail alignment region of influence. BLM field offices are evaluating opportunities for new Areas of Critical Environmental Concern and Special Recreation Management Areas that would provide both passively and actively managed recreation opportunities. There are substantial management efforts to focus off-highway recreation opportunities to appropriate designated areas. For example, the Silver State Off-Highway-Vehicle Trail is a 420-kilometer (260-mile) combination of existing backcountry roads that are currently open and being used by off-highway vehicle enthusiasts. The Lincoln County Conservation, Recreation, and Development Act of 2004 provided for the creation of a Silver State Trail Management Plan to minimize impacts on natural resources and to protect cultural and archaeological resources. The Act also provides for the temporary closure of the Trail in the event that there are unintended adverse impacts on resources associated with the Trail. The proposed Caliente rail alignment would intersect the Silver State Off-Highway-Vehicle Trail in three places; however, the BLM and DOE could effectively manage those intersections.

Cumulative impacts to access to and use of recreational resources along the Caliente rail alignment would be small.

5.2.2.2.6 BLM Rights-of-Way

As urbanization and other development occurs in the Caliente rail alignment region of influence, the need for utility and other rights-of-way will increase. This has already begun to occur and will likely continue in the future in various parts of the Caliente rail alignment cumulative impacts region of influence. The BLM has developed certain preferred corridors over federal lands that it uses to the maximum extent possible for linear rights-of-way, such as for utilities. This keeps many right-of-way purposes together in one location instead of spreading them out over more dispersed areas. However, the BLM also acknowledges the need for exceptions to these standard rights-of-way locations. *Approved Caliente Management Framework Plan Amendment and Record of Decision for the Management of the Desert Tortoise* (DIRS 174200-BLM 2000, p. 27) states that the BLM would "[g]rant power distribution lines 69 kilovolt or less, local telephone, water distribution pipelines and facilities, local fiber optic loops and cable lines outside of designated corridors on a case-by-case basis." Proposed other future projects involving pipelines, railroads, transmission lines, etc., would all change land uses along a linear route if approved through the BLM right-of-way approval process. The BLM also has seen increasing demand for nonlinear rights-of-way, and will continue to grant rights-of-way for these nonlinear projects such as power plants, construction camps, and communication-tower sites.

The land use changes authorized by a BLM right-of-way grant would also have the potential to impact other resource areas as those land-use changes occur. Before approval of right-of-way applications, the BLM will evaluate the impacts of the projects through appropriate NEPA evaluation. Use of land for right-of-way purposes is consistent with BLM regulations and planning processes, and any land-use changes or disturbances associated with those rights-of-way are mitigated to the extent possible and according to BLM policies. As required for the issuance of rights-of-way, the project proponent would prepare and submit to the BLM a Plan of Development for each proposed right-of-way. The Plan of Development would describe the methods and procedures to be used to construct the proposed action on the right-of-way, including site-specific stipulations, terms, and conditions to satisfy all BLM requirements. Certain rights-of-way are long-term in nature and result in unavoidable impacts through land disturbance and the exclusion of other land uses now or in the future.

Utility and other right-of-way crossings are common to linear projects such as roads, railroads, and pipelines. Land areas for the Caliente rail alignment, construction camps, quarries, and access roads would cross or overlap up to 34 existing or proposed utility rights-of-way. Land areas for the proposed railroad facilities could also overlap existing or proposed utility rights-of-way. This situation would be typical for other linear rights-of-way. The crossings would be accomplished with small impact using standard engineering procedures and appropriate design details.

Cumulative impacts to BLM rights-of-way and right-of-way holders would be small.

5.2.2.2.7 Other BLM Land-Management Actions

The Federal Land Policy Management Act of 1976 (Public Law 94-579) mandates the BLM to manage its public lands from a multiple-use perspective. The Federal Land Policy Management Act specifically mentions balancing renewable and non-renewable resources, including but not limited to recreation, range, timber, minerals, watershed, wildlife, fish, natural, scenic, scientific, and historic values. Therefore, the BLM mission to manage the lands to meet multiple-use objectives is challenging, because many of the resources and associated values often conflict.

Within the context of the Caliente rail alignment cumulative impacts region of influence, the BLM planning process and management goals and objectives within their plans are key determinants of the compatibility of the proposed Caliente rail alignment with other projects in the Caliente rail alignment region of influence. Because the BLM is and will remain the major land manager in and around the Caliente rail alignment region of influence, BLM land-management goals, objectives, and subsequent land-management actions will largely determine if and how new projects and activities occur.

BLM objectives and goals within the resource management plans can serve to encourage or restrict activities in certain locations. Areas needing special management attention (such as Areas of Critical Environmental Concern) are also identified in the planning process to protect and prevent irreparable damage to important historical, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. Multiple-use management goals and objectives become more challenging as cumulative development and land-use changes encroach on open land in the Caliente rail alignment region of influence.

The proposed Caliente rail alignment would cross several BLM planning areas. The Las Vegas and Tonopah Resource Management Plans and the Schell and Caliente Management Framework Plans (within the Ely planning district) would be applicable to the proposed location of the Caliente rail alignment. The Ely BLM Field Office is currently preparing an updated Resource Management Plan, which would replace the Schell and Caliente Management Framework Plans when formally adopted. When finalized, the Ely District Resource Management Plan will serve as the initial effort to implement the Eastern Nevada Landscape Restoration Project, which is eastern Nevada's regional program to put into practice the national BLM priority to revitalize the ecological condition of the Great Basin through the Great Basin Restoration Initiative.

These programs and resource management plans require a number of public and private partnerships and a collaborative approach to land management and planning. Grazing operations are a major BLM land-management program in the Caliente rail alignment region of influence. Grazing results in both direct and indirect cumulative impacts to vegetation, habitats, and wildlife in the Caliente rail alignment region of influence. The environmental impacts associated with grazing operations are a function of the location, timing, intensity, duration, and frequency of grazing. Grazing animals directly affect plant communities through trampling and nutrient redistribution. The most noticeable impacts occur around waters, salt blocks, fence lines, and other areas where animals concentrate. With proper grazing management, these concentration areas are limited in extent and mitigated regularly through management procedures such as movement of salt blocks and water hauls. While grazing can stimulate growth of some plants and provide other benefits, it can also reduce plant abundance, density, and vigor, especially in sandy soils.

Ultimately, BLM land management efforts and content of the resource management plans will play a major role in the magnitude, location, and extent of direct, indirect, and cumulative impacts in the Caliente rail alignment region of influence, and in the relative balance among multiple uses and resource values chosen for the public lands. DOE recognizes the importance of these land management actions and encourages readers to review specific resource management plans for more detailed information.

5.2.2.2.8 Urbanization and Economic Development Initiatives

Even without the increased urbanization and economic development caused by the BLM land disposals or expansion of the Las Vegas metropolitan complex northward into the Caliente rail alignment cumulative impacts region of influence, the urbanized areas in the Caliente rail alignment region of influence have generally planned for and solicited ways to grow and increase urbanization. Concepts such as industrial-park development, airport expansion, increased retail opportunities, and housing are prominent goals of the public and private sectors in the Caliente rail alignment region of influence.

The Coyote Springs development and the Toquop Township (24 kilometers [15 miles] northwest of Mesquite in southern Lincoln County) are examples of major potential community development sites. The Coyote Springs development has entered its initial development phase and is planned to include a full suite of homes, zoning regulations, services, and infrastructure in direct association with the BLM land sales of the 53 square kilometers (13,000 acres) of public land resulting from the Lincoln County Land Act of 2000. This trend is likely to continue, with land-use and ownership changes and potential land-use conflicts becoming an increasing issue and challenge for the future.

With or without the proposed railroad, urbanization and economic development activities, while increasing, would not generally change the overall undeveloped character of the Caliente rail alignment region of influence.

5.2.2.3 Aesthetic Resources

Cumulative impacts to aesthetic resources from the proposed railroad and other regional activities would primarily result from modifications to natural ***viewsheds***. The natural setting of the Caliente rail alignment region of influence includes vast and expansive viewsheds typical of much of the western United States. The open spaces and wide vistas offer interesting cloud, weather, and landscape interactions. Human activity disturbs the natural viewsheds with land disturbances such as buildings, roads, removal of vegetation, power lines, equipment, and vehicles. Any activity that disturbs substantial areas of land can result in visual impacts from fugitive dust and ground scars. Additionally, most man-made structures are designed and built for their functionality and safety, not for their visual appeal. For example, projects with construction-related equipment, facilities, and activities can include the presence of workers, camps, vehicles, machinery, lay-down yards, and dust.

The presence of the railroad would be an identifiable change to the regional viewsheds from some observation points and provide a noticeable contrast with natural visual attributes. The passage of a train would attract the attention of an observer, both because of the noise associated with the train and the change in the landscape, especially if the train were to fall in the foreground or middle ground of the viewshed. Visual impacts of passing trains would be temporary, but visual impacts of the track would be long-term.

Visual resources within the region of influence have been considered through application of the BLM Visual Resource Management System (see Sections 3.2.3 and 4.2.3 and Appendix D of this Rail Alignment EIS). This system identifies and classifies the BLM-administered lands within established visual resource objectives, and proposed activities are evaluated within the visual resource management framework to consider consistency with the visual resource objectives. Without restoration and reclamation efforts, ground disturbances in the regional environment would last for long periods. The magnitude and extent of potential visual impacts vary based on the number of viewers affected, distance and atmospheric conditions of viewing, degree of visual contrast compared to existing visual attributes, viewer sensitivity to the visual changes, and compatibility with existing land uses. BLM generally requires ground disturbances to be restored and reclaimed as part of project approval.

For the Caliente rail alignment, analysis using the BLM Visual Resource Management System indicated that the proposed railroad could be inconsistent with visual resource management objectives in the areas of the Caliente-Indian Cove Staging Yard during construction, in Garden Valley during railroad construction and operations, and in some other sites of rock cuts and fills during construction and operations. As shown in Appendix D, lands that have potential restrictive visual resource objectives (Classes I and II) are not prevalent in the region of influence.

There would be no known interactions of the proposed railroad with other reasonably foreseeable activities that would affect a Class I or Class II area in the Caliente region of influence.

5.2.2.4 Air Quality and Climate

Emissions of concern in the Caliente rail alignment region of influence include ***fugitive dust*** and emissions resulting from the operation of machinery and equipment. Construction activities such as surface disturbance and use of haul trucks in the Caliente rail alignment region of influence would generate fugitive dust. Fugitive dust is a type of nonpoint source air pollution (small airborne particles that do not originate from a specific point). These ***particulate matter*** emissions are regulated according to their size (aerodynamic diameter equal to or less than 2.5 micrometers [$PM_{2.5}$] and 10 micrometers or less [PM_{10}]). Fugitive dust is generally controlled through the application of water, or in some cases, application of a chemical compound designed to minimize dust emissions. Most of the projects and activities identified in this analysis would generate some level of fugitive dust. The plumes associated with fugitive dust generation are often localized to the area being disturbed and are temporary. In arid areas such as the Caliente rail alignment cumulative impacts region of influence, generation and control of fugitive dust will always be a concern. Exhaust emissions from the operation of machinery and equipment include sulfur dioxide, oxides of nitrogen, volatile organic compounds, and carbon monoxide.

There is a comprehensive air quality permitting system in Nevada to evaluate and approve only those projects that are allowable within quantitative air quality thresholds. The Nevada Division of Environmental Control, Bureau of Air Pollution Control, has established and implemented air pollution control requirements in Nevada Revised Statutes 445B.100 through 445B.825, inclusive, and Nevada Revised Statutes 486A.010 through 486A.180, inclusive. The Bureau of Air Pollution Control has jurisdiction over air quality programs in all counties in the state except Washoe and Clark. The Bureau of Air Pollution Control also has jurisdiction over all fossil fuel-fired units in the state that generate steam for electrical production. The Caliente rail alignment would be subject to the permitting requirements noted above, and would occur in air basins that are either in attainment or unclassifiable. The State of Nevada will not grant permits for activities that cannot show compliance with the applicable federal and state regulations will not be permitted.

The air quality impact analysis for the Caliente rail alignment assessed potential impacts through several means including air quality modeling of maximum concentrations relevant to National Ambient Air Quality Standards. The analysis concluded that emissions during construction or operation of the rail line or any associated facilities would be in conformance with applicable standards with the possible exception of the 24-hour National Ambient Air Quality Standards for PM_{10}, which could be exceeded from quarry operations at South Reveille Valley during the construction phase. DOE would be required to prepare an application for a Dust Control Permit and a Surface Area Disturbance Permit Dust Control Plan and submit them to the Nevada Division of Environmental Protection Bureau of Air Pollution Control prior to quarry development. It is likely that the requirements of the plan would greatly reduce fugitive dust particulate matter emissions, thus reducing the possibility of exceeding National Ambient Air Quality Standards.

Potential cumulative impacts to air quality from construction and operation of the proposed railroad along the Caliente rail alignment would be small, but could approach moderate if the potential violation of the National Ambient Air Quality Standards noted above occurred.

5.2.2.5 Surface-Water Resources

5.2.2.5.1 Changes in Drainage, Infiltration Rates, and Flood Control

Construction of major projects in previously undeveloped areas often results in changes to natural drainage. Construction could include regrading that would allow runoff from a number of minor drainage channels to collect in a single culvert or pass under a single bridge, which would result in water flowing from a single location on the downstream side rather than across a broader area. This would cause some localized changes in drainage patterns, but this probably would occur only in areas where natural drainage channels are small. Compaction of soil during construction could reduce water infiltration rates and change natural runoff and drainage patterns. However, some activities would disturb and loosen the ground for some time, which could cause higher infiltration rates.

Construction in washes or other flood-prone areas probably would reduce the area through which floodwaters naturally flow. This could result in water building up, or ponding, on the upstream side of crossings during flood events, and then slowly draining through the culverts or bridges. These alterations to natural drainage, sedimentation, and erosion would be unlikely to increase future flood damage, increase the impact of floods on human health and safety, or cause significant harm to the natural and beneficial values of the floodplains.

One special area of drainage/flooding concern, however, involves the Meadow Valley Wash area near the City of Caliente. The Caliente alternative segment would start next to Meadow Valley Wash in an area where the wash is joined by Clover Creek, and travel up Meadow Valley alternatively running adjacent to, or crossing the wash. The Federal Emergency Management Agency has studied Meadow Valley Wash, Antelope Canyon Wash, and Clover Creek Wash for flooding potential within the corporate limits of the City of Caliente and for some portions of Lincoln County. One-hundred-year water surface elevations and regulatory floodways have been established for these watercourses within the area studied. Encroachment into the floodway is prohibited unless it can be determined that such an encroachment into the floodway portion of the floodplain does not cause any increase in the water surface elevations for these watercourses. The area has a history of flooding events that can affect the roads, trails, and Union Pacific rail lines. In January 2005, a substantial flooding event occurred in the Meadow Valley Wash area. The BLM is currently involved in a multi-agency evaluation of remedial actions to avoid drainage/flooding issues in the area. The presence of the proposed railroad in this area has raised concerns about the potential interaction of railroad operations with future flooding events; these concerns and issues are currently being evaluated through the multi-agency evaluation and appropriate measures to reduce direct, indirect, or cumulative impacts would be identified through that process.

Overall effects would generally be localized to each specific project, and these concerns and potential impacts are factored into project design considerations as standard engineering and construction operating procedures. While cumulative impacts would be small, the risks and localized impacts from a flood event such as that experienced in the Meadow Valley Wash area in 2005 cannot be totally eliminated.

As a long linear project of up to 541 kilometers (336 miles) long (DIRS 180916-Nevada Rail Partners 2007, Table E-2), a rail line along the Caliente rail alignment would pose new surface drainage challenges because of the existing characteristics of terrain, topography, soils, and physical features. Construction activities that could temporarily block surface drainage channels include moving large amounts of soil and rock to develop the rail roadbed (subgrade) and constructing temporary access roads to reach construction initiation points and major structures, such as bridges, and to allow movement of equipment to the construction initiation points.

Project planning and best management practices would help avoid or reduce potential impacts from the proposed railroad or other ongoing or reasonably foreseeable future actions. Potential cumulative impacts due to changes in drainage, infiltration rates, and flood control would be very small and localized.

5.2.2.5.2 Spill and Contamination Potential

Major construction activities and other projects in the region of influence would use materials including petroleum products (fuels and lubricants) and coolants (antifreeze) necessary to operate construction equipment, and could include solvents used in cleaning or degreasing actions. A release or spill of contaminants to a stream or river would have the greatest potential for adverse environmental impacts; a release of contaminants to dry impermeable soil would have the least potential for adverse impacts. Spill-control and management plans (and standard operating procedures for the construction industry) would reduce the likelihood of spills. Railroad construction and operation along the Caliente rail alignment would be typical of major activities that use materials that could cause contamination through spills.

While the risk of a spill and associated water contamination cannot be totally eliminated, risks can be managed through regulatory controls so that the resulting cumulative impacts would be small.

5.2.2.6 Groundwater Resources

Increasing urbanization and other development in the Caliente region of influence presents the challenge of matching water supply with water demand. Because water availability is a potential resource constraint in the Caliente rail alignment region of influence over time, water demand can be both competitive among potential users and controversial among users and the general public. To allocate water uses, the State of Nevada uses a water permit application process coordinated by the State Engineer. Once granted, water rights in Nevada have the standing of both real and personal property. It is possible to buy or sell water rights and change the water's point of diversion, manner of use, and place of use by filing the appropriate application with the State Engineer. Overall, because the water permitting and allocation process considers the broad range of factors noted above, the process serves as a way to manage potential cumulative impacts of water demand and use within each basin.

Representative existing and reasonably foreseeable water users in the Caliente rail alignment region of influence include:

- Agriculture, which consumes the most water in the Caliente rail alignment region of influence. Based on groundwater usage data compiled by the U.S. Geological Survey, during calendar year 2000, approximately 46 percent of groundwater withdrawals in the State of Nevada were for irrigation, about 26 percent were for mining purposes, and the remainder were for drinking-water systems, geothermal production, and other uses.
- The Toquop power plant, the FEIS for which (DIRS 174208-BLM 2003, all) estimates future water needs associated with a portion of recent BLM land dispositions and the Coyote Springs residential development (at build out) to be roughly 140 million cubic meters (115,000 acre-feet) per year.
- The Clark, Lincoln, and White Pine Groundwater Development Project (Southern Nevada Water Authority) (DIRS 175909-Hafen et al. 2003, all), which would result in water withdrawal and transfer of up to 250 million cubic meters (200,000 acre-feet) per year.
- The combined effects of the Lincoln County Land Act Groundwater Development Project and the Kane Springs Valley Groundwater Development Project (DIRS 175909-Hafen et al. 2003, all), which would produce more than 35 million cubic meters (28,000 acre-feet) of water per year for conveyance to other locations.

- Groundwater withdrawals, which if approved, would be associated with the specific water-rights applications that have been submitted for proposed new municipal or irrigation wells in hydrographic areas 181, 208, and 172 (see Section 5.2.1.3.2).
- Recently constructed or planned power plants (water-cooled) in the Apex and Moapa areas, which require about 8 million to 9 million cubic meters (6,500 to 7,000 acre-feet) of water per year. The air-cooled power plants in those areas require less than 123,000 cubic meters (100 acre-feet) of water per year.
- The Nevada Test Site, which uses about 830,000 cubic meters (673 acre-feet) of water per year.
- Grazing activity in the 38 allotments around the proposed Caliente rail alignment, which demands about 600,000 cubic meters (500 acre-feet) of water per year.
- The Yucca Mountain Repository, which would have demands ranging from about 218,000 to 527,000 cubic meters (176 to 427 acre-feet) of water per year between calendar years 2010 and 2013 (this represents the period of the highest water demand for the proposed railroad project). The Repository would use approximately 76,700 to 397,000 cubic meters (62 to 322 acre-feet) of water per year in calendar year 2014 through completion of operation.

Excluding the large agricultural water use in the Caliente rail alignment region of influence, cumulative water use for the projects described above could total more than 430 million cubic meters (350,000 acre-feet) per year. Overall, the share of water that would be committed to construction and operation of the proposed railroad would represent a small portion of water use in the Caliente rail alignment region of influence, which would still be dominated by agriculture. Committed groundwater resources already exceed annual perennial yield values (a measure of available groundwater supply replenished each year through recharge) within some of the groundwater basins (hydrographic areas) that would be affected by the proposed railroad. Based on the proposed locations of new wells in specific hydrographic areas along the Caliente rail alignment, additional groundwater appropriations would be needed in 19 hydrographic areas. However, committed (cumulative) groundwater resources currently exceed estimated perennial yields in eight of these hydrographic areas (146, 149, 170, 173A, 203, 204, 228, and 229). One of these eight hydrographic areas (229) and two other hydrographic areas (144 and 145) the rail would cross have low perennial yields. Five of these areas are State of Nevada-designated groundwater basins. While designated groundwater basins are not considered closed to additional appropriations, the State Engineer could impose additional restrictions and preferred uses of the water in these designated basins.

A number of scenarios have been developed to assess the potential effects of the proposed Caliente rail alignment's contribution to cumulative water demand in the Caliente rail alignment cumulative impacts region of influence. The assumption used for developing these scenarios is that proposed railroad construction and operation and associated quarry and rail facility construction and operation water demands would be met through installing and withdrawing groundwater from new wells. Pumping in individual wells would occur primarily over 9 months to support construction, over 2 to 3 years at quarry sites, and over the rail system operational period for the rail facilities. Total water withdrawals associated with the proposed railroad could substantially exceed annual perennial yield values for hydrographic areas 145 and 229, and could represent approximately 99 percent of the annual perennial yield in hydrographic area 227A. In other areas, water withdrawals associated with the railroad could range from less than 1 percent to as high as 57 percent of the annual perennial yield value.

A proposed new irrigation well in Dry Lake Valley would have an average pumping rate of approximately 17,000 liters (4,488 gallons) per minute and the would operate year round This application is currently under protest. If this well application were to be approved and the well installed and used contemporaneously with a nearby proposed well location (location DLV3), analysis results indicate that the proposed new DLV3 well location would lie within the radius of influence of this irrigation well and the DLV3 well location would therefore not be viable. In that event, DOE could obtain the water required from one or more alternative proposed well locations from which the simultaneous pumping from that well location or locations and the proposed municipal well would not impact each other's operation, water could be obtained from an existing water rights holder, or one or more other best management practices could be implemented to preclude cumulative impacts from occurring.

The proposed new municipal well that would be northeast of a DOE-proposed new well location (PahV9) in Pahroc Valley would have an average pumping rate of up to 10,200 liters (2,690 gallons) per minute, and would operate year round. If this municipal well application were to be approved and the well installed and used contemporaneously with the DOE-proposed well(s) at location PahV9, analysis results indicate that, depending on the transmissivity (hydraulic conductivity) of the host consolidated rock unit aquifers involved, withdrawal of groundwater at a rate of up to approximately 920 liters (244 gallons) per minute from an equivalent single well at the PahV9 could either not, or might, impact pumping operations at the proposed new municipal well location, and vice versa. The 920-liter-per-minute pumping rate used in the analysis comprises the total withdrawal rate required for well locations PahV7, PahV8, and PahV9 combined and, therefore, represents a very conservative assumption. If hydraulic conductivities of the host aquifers are similar to values estimated in some published reports (such as DIRS 176852-Drici et al. 1993, p. 56), the proposed municipal well and the DOE-proposed well(s) at location PahV9 would not be expected to impact each other's operations if the two well locations were to be pumped simultaneously and the average pumping rate at location PahV9 were as high as 924 liters (244 gallons) per minute. Alternatively, if host aquifer hydraulic conductivity values were lower, if necessary, the average pumping rate imposed at location PahV9 could be restricted to a sufficiently low value (with the remainder of the required water acquired from locations PahV7 and/or PahV8), some of the required amount of water could be obtained from an existing water rights holder, if needed, or one or more other best management practices could be implemented to preclude potential impacts resulting from simultaneous groundwater withdrawals from the PahV9 location and the proposed new municipal well location.

Water rights applications have been submitted for two proposed municipal wells that would be approximately 1.5 kilometers (0.9 mile) northeast of, and approximately 1 kilometer (0.6 mile) northeast of, two DOE-proposed new well locations in hydrographic area 208, respectively. These water rights have not yet been granted and given the relatively long timeframes (20 years) estimated for completing the infrastructure components required for these wells, even if the applications were approved, these wells would likely be placed into use at a time beyond the proposed railroad projected 4- to 10-year construction phase. Therefore, DOE did not evaluate potential cumulative impacts from these proposed future municipal supply wells.

A water rights application has been submitted for a proposed municipal well that would be approximately 1.2 kilometers (0.8 mile) southwest of a DOE-proposed new well location (GV10) in Garden Valley (hydrographic area 172). At present, the Nevada Department of Water Resources lists the status of this well as "Ready for Action." The well has an estimated time to construct of 10 years. If this well application were to be approved and the well installed and used contemporaneously with the DOE-proposed GV10 well(s), the GV10 well location would lie within the radius of influence of this municipal well; therefore, the GV10 well location would not be viable. In that event, the Department could (1) obtain the required water from one or more alternative DOE-proposed wells from which the simultaneous pumping from that well(s) and the proposed municipal well would not impact each other's operation; (2) obtain water from an existing water rights holder; or (3) or implement one or more other best management practices to preclude cumulative impacts.

By utilizing one or more specific approaches or a combination of approaches for obtaining groundwater for construction of the proposed railroad (including approaches that are tailored to a hydrographic area's unique groundwater conditions), potential cumulative impacts to groundwater resources would be minimized. New groundwater withdrawals could, depending on the withdrawal rate; the hydrogeologic conditions present at the proposed pumping location and in the surrounding area; and the location and characteristics of nearby groundwater resource features, cause some decrease in the amount of water that might be available to an existing well having an associated water right, to an existing spring discharge, or to a downgradient groundwater basin.

Overall, the needs of the proposed railroad would represent a small portion of the current cumulative water usage within the Caliente rail alignment region of influence, which in some locations would continue to exceed perennial yield values.

5.2.2.7 Biological Resources

5.2.2.7.1 Habitat Loss and Fragmentation

The past, present, and reasonably foreseeable future actions in the Caliente rail alignment cumulative impacts region of influence would result in noticeable cumulative land disturbance. Existing activities such as the Nevada Test and Training Range and the Nevada Test Site have already resulted in land disturbance, and projects such as the various proposed rights-of-way and the Coyote Springs development would continue this trend. Such land disturbances result in altered natural biological and ecological conditions, and directly serve to reduce the amount of natural land available as habitat and open space.

The primary adverse construction-related impacts to vegetation communities from ground disturbance are the physical destruction or removal of the vegetation, and the permanent or temporary removal or compaction of the topsoil or other growing medium for the plants. These effects would occur with any major activity resulting in ground disturbance, including the proposed railroad. As more activity occurs, the cumulative loss of vegetative communities and associated habitats would increase. Management of these effects would typically be considered in project planning and mitigation, including projects on BLM-administered land. Much of the emphasis in land management in the Caliente rail alignment region of influence concerns the maintenance or reconstruction of healthy habitats.

Habitat destruction leads to direct impacts such as wildlife injury and mortality, alteration of behavior and movement patterns, and the indirect impacts of reduced vegetative health, reduced biological diversity, and locally degraded ecological function. When extensive habitat fragmentation occurs, the individuals or populations of particular species may have difficulty surviving. Habitat destruction arises from a number of sources, including projects that involve land disturbance, land management actions including wild horse and burro management. Though any project that causes disturbance of vegetation contributes to habitat fragmentation, linear projects that impose any degree of impediment to movements, like the proposed railroad, amplify the potential effects. A number of utility and water rights-of-way are anticipated in the eastern portion of the proposed Caliente rail alignment, with many of these crossing the Caliente rail alignment.

Measures to avoid, minimize or otherwise reduce impacts are typically implemented by project proponents and encouraged by government agencies and generally include actions to reduce or avoid habitat fragmentation and loss. Such actions would include minimizing land disturbance, using existing roads, interim reclamation, combined roads/utility rights-of-way for pipelines and cables, noise reduction, centralization of facilities, and employee training and education.

In areas proposed for railroad operational purposes, the impacts to vegetation would typically be moderate in scope, and cumulatively add to habitat loss and fragmentation. However, in areas slated for short-term use during construction, such as construction camps, revegetation and reclamation efforts would result in replacement of topsoil, reseeding of native species, monitoring for success, and eventual return of a native vegetation community somewhat comparable to predisturbance conditions.

Cumulative impacts due to habitat loss and fragmentation would be small to moderate through the construction and operations phases throughout the Caliente rail alignment region of influence.

5.2.2.7.2 Invasive Species and Noxious Weeds

Invasive species and noxious weeds naturally move into new areas over time, but this occurrence has been accelerated in many areas through human activity, either intentionally or by accident. In many cases these plants have been moved into North America from another continent. They have been accidentally introduced through contaminated grain or hay, or sometimes intentionally introduced for erosion control or as ornamentals. In addition, livestock and vehicles can cause invasive species and noxious weeds to spread, birds could carry seed, or the species can be brought in with contaminated fill dirt. Regardless of how they were introduced, invasive species and noxious weeds possess characteristics that allow them to compete aggressively with native vegetation. Invasive species and noxious weeds impact native plants, animals, and natural ecosystems by:

- Reducing biodiversity
- Altering hydrologic conditions
- Altering soil characteristics
- Altering fire intensity and frequency
- Interfering with natural succession
- Competing for pollinators
- Displacing rare plant species
- Replacing complex communities with single-species monocultures

From a cumulative impacts perspective, any time land is disturbed and native vegetation is lost there is an opportunity for noxious weeds to replace the native vegetation. While the BLM and other land owners/managers in the area have implemented programs to minimize this potential, invasion of noxious weeds cannot always be prevented. Therefore, coordinated multi-agency management actions and efforts are needed to mitigate the effects from cumulative land disturbance. Management of noxious and invasive weeds is essential for restoration of native plant community health and resiliency. If noxious and invasive weeds were not managed, they would continue to gradually replace more desirable native species throughout the Caliente rail alignment region of influence.

Linear disturbances such as pipelines, roads, utility corridors, or rail alignments that cross relatively undisturbed land have the potential to exacerbate the spread of these species into areas not previously affected. As the invasive or noxious weeds become established along the linear features they spread to adjacent areas, affecting the plant and animal communities beyond the actual disturbance, and are able to out-compete native species by responding more rapidly to the infrequent availability of water.

These impacts could occur as a result of railroad construction and operation and from existing or foreseeable projects, but strict adherence to best management practices would reduce the potential for impacts. Cumulative impacts due to the introduction and spread of invasive species and noxious weeds would be small.

5.2.2.7.3 Special-Status Species

Habitat for several special-status species would be disturbed and individuals of several of the species could be killed or injured during construction and operation of the proposed Caliente rail alignment. Implementation of best management practices, making minor adjustments to site locations during final design, and conducting pre-construction clearance surveys would substantially reduce these potential impacts. Through the NEPA and permitting processes, each proposed project and land management planning effort in the Caliente rail alignment region of influence will face challenges for the protection of various special-status species. There are a number of special-status species that could be affected by cumulative impacts in the Caliente rail alignment region of influence. Recent attention has focused on several specific species, including the desert tortoise and greater sage grouse, as discussed below.

The Mojave population of the desert tortoise (*Gopherus agassizii*) is listed as threatened under the Endangered Species Act of 1973 (16 U.S.C. 1531 to 1544). It is found within the proposed Caliente rail alignment only in the southwestern-most 48 kilometers (30 miles), from the Beatty Wash area to Yucca Mountain (DIRS 101830-Bury et al. 1994, pp. 55 to 72). The desert tortoise is found in southern California, parts of southern Utah, and in the southern portions of Nevada, with the tortoises potentially affected by railroad construction and operation at the extreme northern extent of their range. While relative abundance of the tortoise is low in much of the Caliente rail alignment region of influence, every action that could disturb soil or vegetation within the tortoise's range has potential cumulative impacts of loss or fragmentation of the species' habitat or the direct mortality of individual desert tortoises,

The BLM resource management plans sometimes place restrictions on other activities (such as grazing, wild horse and burro abundance, off-road vehicle use, mineral activities) so that desert tortoise or other special status species habitat can be protected. However, off-road vehicle use, shooting, and collecting of individuals continue to affect tortoise populations. Habitat protection efforts for the desert tortoise are coordinated among a number of federal, state, and local governmental agencies, with the cumulative impact perspective a major factor in determining allowable impacts to the tortoise. Restoration plans and habitat conservation plans also affect the required mitigation measures, best management practices, and standard operating procedures for the protection of the desert tortoise or other special-status species.

In early 2005, the U.S. Fish and Wildlife Service completed its status review of the greater sage-grouse (*Centrocercus urophasianus*) throughout its range and determined that the species does not warrant protection under the Endangered Species Act at this time. The BLM would maintain habitats used by the greater sage-grouse in consideration of the priorities identified in the BLM National Sage-Grouse Conservation Strategy. This strategy considers that the greater sage-grouse has been substantially affected throughout the Great Basin by habitat loss due to residential development and the associated infrastructure; habitat degradation from heavy grazing, drought, and invasive and noxious weeds; habitat fragmentation from development of roads and other rights-of-way; and other activities throughout the Caliente rail alignment region of influence. A number of projects within the Caliente rail alignment region of influence, including the potential for wind-energy projects and associated infrastructure, have the potential to directly affect this species in a number of areas. The proposed Caliente rail alignment could pass near a small portion of previously used sage-grouse habitat, but it is not expected that the project would have direct, indirect, or cumulative impacts on this species.

Private landowners, corporations, state or local governments, or other non-federal landowners who wish to conduct activities on their land that might incidentally harm (or "take") wildlife listed as endangered or threatened must first obtain an incidental take permit from the U.S. Fish and Wildlife Service. To obtain a permit, the applicant must develop a Habitat Conservation Plan designed to offset any harmful effects the proposed activity might have on the species. Multi-species Habitat Conservation Plans are underway in two places in the Caliente rail alignment region of influence: (1) the Coyote Springs area and (2) in southern Lincoln County in the area of the recent BLM land disposal. Additionally, there is a single species (desert tortoise) Habitat Conservation Plan being developed in the Pahrump area of Nye County. These plans would support development of private lands while accounting for the potentially affected species.

No major effects on special status species are projected to result from construction and operation of the proposed railroad along the Caliente rail alignment. DOE would conduct any required consultation with the U.S. Fish and Wildlife Service in accordance with the Endangered Species Act. There is a substantial regulatory framework, to which all projects are subject, that serves to evaluate and protect special status species. Therefore, cumulative impacts to special status species would be small.

5.2.2.7.4 Wildfires

Wildfires are a major environmental concern throughout the Caliente rail alignment region of influence due to the generally dry climate and the increasing presence of invasive plant species. When they occur, wildfires have a significant and long-term impact on vegetation, wildlife, other natural resources, and human safety. The most important biological effects of fires include:

- Loss of native plant communities
- Decreased stability of watershed and soils
- Decreased or degraded wildlife habitat
- Increase in potential for invasive species spread
- Overall disruptions to ecological function

Sources of regional wildfires are both natural (for example, lightning) and human caused. With increased activity in the Caliente rail alignment region of influence, the potential for future human-caused fires increases. Because the BLM administers most of the land in the Caliente rail alignment region of influence, the BLM has primary fire-avoidance and fire-fighting responsibilities in the Caliente rail alignment region of influence.

Both the proposed railroad project and other reasonably foreseeable future actions would likely implement appropriate fire-avoidance strategies in consultation with the BLM. Potential cumulative impacts from wildfires would be small.

5.2.2.8 Noise and Vibration

5.2.2.8.1 Railroad Noise

The Union Pacific Railroad is the predominant ***Class I commercial railroad*** in Nevada and has operated in the state for many years. Noise associated with Union Pacific Railroad operations is part of the existing environment, specifically in the area of Caliente where the presence of the railroad is very evident. The sounds associated with the Union Pacific Railroad in and near the City of Caliente include wayside noise (noise generated by the cars and locomotives) and horn sounding. The individual operating rules of each railroad require train engineers to sound horns when approaching most grade crossings. Horn sounding is generally not required at private crossings. Wayside noise and horn sounding are common in Caliente and other portions of the existing Union Pacific Railroad routes.

The Toquop Energy Project could involve a new short rail spur of about 50 kilometers (30 miles) in an isolated part of Lincoln County south of Caliente. This spur would connect with the Union Pacific Railroad system but would be in an area that would not have any identifiable noise receptors.

Transportation of spent nuclear fuel and high-level radioactive waste casks along the Caliente rail alignment would result in as many as eight one-way trips per week. Train activity associated with supply and maintenance of the Yucca Mountain Repository is also proposed (as many as seven one-way trips per week), as is Caliente rail alignment maintenance activity (about two one-way trips per week), for a total of about 17 one-way trips per week. During construction, the completed portions of the rail line could also be used to deliver ballast to construction areas.

Potential noise impacts (as evaluated through noise modeling near Caliente, in Garden Valley, and in Goldfield) would be expected to be small. Construction and operation of a railroad along the Caliente rail alignment would introduce railroad noise into areas of the Caliente rail alignment region of influence that previously had none. This could result in annoyance for some people.

5.2.2.8.2 Urban Noise

As the population increases in Lincoln, Nye, and Esmeralda Counties, existing towns will grow and new residential areas will develop characteristics of more urban areas. Urban noise includes automobiles, construction activities, barking dogs, and other human activities generally within an identifiable community. At present, urban noise in the Caliente rail alignment region of influence is limited because there are only a few cities and communities. However, with economic development and growth goals throughout the Caliente rail alignment region of influence, the number and scope of urbanized areas is expected to increase. Urban noise is generally localized and is differentiated from aircraft and railroad noise sources, which move with the source from one location to another, while urban noise is within identifiable geographic borders associated with the locations of populations.

The proposed railroad would have a very small effect on urbanization in the area, and its effect on urban noise in the Caliente rail alignment region of influence would be small. Cumulative impacts related to urban noise would be small.

5.2.2.8.3 Aircraft Noise

Noise from aircraft engines and sonic booms is common throughout most of the Caliente rail alignment cumulative impacts region of influence, and can cause "startle" and annoyance effects. The noise associated with military aircraft is consistent with the "dominant use" of the area for military and defense-related activities at the Nevada Test and Training Range. Any noise effects associated with Nevada Test and Training Range missions would be considered necessary and unavoidable. Commercial air traffic also contributes to noise impacts in the region of influence.

The proposed railroad project would not contribute to cumulative aircraft noise.

5.2.2.8.4 Vibration

Vibration can be perceived on land surfaces and within buildings with certain types of activities. Construction activity is one of the more common sources of vibration, but railroad construction vibration would be very localized and typically minor in scope and duration. In the Caliente rail alignment cumulative impacts region of influence, other possible sources of vibration include occasional testing activities at the Nevada Test and Training Range and sonic booms from aircraft-related military activities in the airspace above the region of influence. These events would also tend to be short term and localized.

Cumulative impacts from vibration would be small.

5.2.2.9 Socioeconomics

The economy in the Caliente rail alignment cumulative impacts region of influence has traditionally been based on mineral development and livestock grazing. However, the economy in the region of influence is changing, just as land uses are changing. New economic drivers include services, retirement communities, and tourism, including recreation opportunities.

While the proposed railroad would be a major development in the Caliente rail alignment region of influence, its long-term economic development potential would be limited and would primarily be related to construction activities. This pattern of larger magnitude, short-term construction impacts followed by relatively small, long-term operations impacts for linear projects (for example, pipelines and transmission lines) is not uncommon in the Caliente rail alignment region of influence. If the Shared-Use Option were chosen and implemented, there would be greater potential for positive economic development benefits compared to the Proposed Action.

Population growth in the Caliente rail alignment cumulative impacts region of influence is projected to occur in existing residential areas such as Caliente and Tonopah, but also in new areas such as Coyote Springs and the BLM land-disposal areas in Lincoln County. It is uncertain if there is sufficient economic development growth potential in these areas to support all of the desired growth. It is possible that some areas would grow at the expense of other areas, or that recently developed plans for growth turn out to be unrealistic. Provision of housing to meet market demand is a private-sector activity, with the private-housing sector assumed to build to the needed level to meet housing demand at the appropriate locations. One of the factors that will affect how and where growth occurs is the availability of infrastructure to support the growth. Beyond the traditional infrastructure needs like roads, sewer, water, and public buildings, modern infrastructure such as the availability of fiber optic lines might also affect growth patterns. For example, the availability of fiber-optic lines or other high-technology infrastructure is likely to be a substantial growth discriminator for both businesses and individuals. The locations of and extent to which factors such as fiber-optic lines would ultimately affect growth cannot be projected at this time.

The recent and potential future BLM land disposals have the potential to provide land for private sector projects such as housing, industrial or commercial facilities, or other developments. In addition to the growth opportunities presented by the BLM land disposals, the proposed Coyote Springs community would be comprised of about 170 square kilometers (43,000 acres), about two-thirds of which would be in Lincoln County and one-third of which would be in Clark County). As envisioned, the development would be a series of neighborhoods with villages nestled between open-space corridors. It is planned to consist of both second-home residents and commuters to Las Vegas (about 80 kilometers [50 miles] away), with initial plans to focus on a role as a destination vacation location. At final build-out, the development could provide about 47,500 residential housing units. However, the development has not procured sufficient water rights for build-out, and the ability to reach its build-out objectives is primarily dependent on water availability.

As part of the Shared-Use Option analysis for this Rail Alignment EIS, the existing decisionmakers for Lincoln, Nye, and Esmeralda Counties, and the City of Caliente clearly stated their objective to grow and develop with additional business enterprises. Esmeralda County is working on a plan to relocate the Goldfield airport to a point west of the community, and develop a light industrial/manufacturing complex adjacent to the airport. The City of Caliente is working on the redevelopment of a 0.24 square kilometer (60-acre) industrial park south of the city, and Lincoln County is working aggressively to attract new business from Southern California and Las Vegas to the area.

The State of Nevada has developed population projections for the Caliente rail alignment cumulative impacts region of influence (DIRS 178807-Hardcastel 2006, all) as follows:

- Esmeralda County is projected to have a small decrease in population from 2005 to 2026
- Lincoln County is projected to add only about 2,000 persons from 2005 to 2026
- Nye County is projected to add more than 32,000 persons from 2005 to 2026

The Nevada State Demographer develops population projections for Nevada counties, which are always subject to change with new information. For example, the full potential growth from Coyote Springs and the BLM land disposals in Lincoln County over the next 20 years would increase population growth beyond the State Demographer's projections for Lincoln County.

Nye County's projected growth continues a recent trend, with growth in Pahrump very evident over the past several years. Growth in Pahrump is being driven by low-cost land, proximity to the Las Vegas metropolitan area, and relocation of retirees to the area. Growth in Nye County is also linked directly to existing and future Yucca Mountain Site operations.

As discussed in Section 4.2.9 of this Rail Alignment EIS, DOE used an economic model to estimate potential socioeconomic impacts of the proposed rail line (DIRS 182251-REMI 2007, all). The model includes consideration of construction and operation employment and wages, project-related spending, and other parameters that could affect the socioeconomic environment. The model included a future baseline of socioeconomic parameters that would represent a cumulative impacts baseline without the proposed railroad (see Table 3-61 of this Rail Alignment EIS).

Consistent with the methodology established in the Yucca Mountain FEIS (DIRS 155970-DOE 2002, p. 4-43), most of the construction workers for the proposed railroad are assumed to be residents of Clark County. This assumption is made because the construction sectors in Nye, Lincoln, and Esmeralda Counties are not large enough to provide enough workers for construction activities. Therefore, it is not surprising that Clark County is projected to attain the largest levels of construction-related employment, income, and spending effects from the proposed project, followed by Nye, Lincoln, and Esmeralda Counties. Lincoln County would experience the largest employment percentage increase during construction with an estimated increase of about 6 percent above baseline conditions.

Employee locations for the operations phase would follow the same general pattern and relative magnitude of the construction phase, but there would be fewer operations jobs than construction jobs. Gains in employment during the operations phase would be felt most strongly in Lincoln County, where the peak percentage change in average annual employment is projected to be 4 percent above baseline conditions during full operations. Esmeralda County is the only other county in the region of influence projected to experience more than a 1-percent change in average annual employment at any point during the operations phase (3-percent change).

Population changes that would result from railroad construction and operations are also projected to generally follow this pattern. During the construction phase, the upper bound of increase to population would be about 2 percent or less of the future cumulative population baseline in all four counties. The operations phase population change would have the largest percentage increase compared to the cumulative baseline in Lincoln County (about a 3-percent average annual increase over the baseline).

Strains on housing infrastructure during the construction phase would not be anticipated, because most construction workers could be housed in construction camps at strategic locations along the proposed Caliente rail alignment, rather than in nearby communities. Contractors might elect to use commercially available facilities for housing construction personnel at locations such as Caliente, Tonopah, Goldfield, Beatty, and Pahrump. There would be enough vacant housing in these locations to absorb both construction and operations personnel.

Some infrastructure impacts would be expected where construction activities or operating facilities were near communities. For example, construction workers, including those from the proposed railroad, could strain the existing health care service capacity in the Caliente rail alignment region of influence, particularly in Caliente, Goldfield, and Tonopah. The operations-related population gains could also result in identifiable effects on health and education-related services.

The road network in the Caliente rail alignment region of influence consists generally of two-lane highways and unpaved roads. In rural, less populated parts of the Caliente rail alignment cumulative impacts region of influence, roads are adequate to handle existing and projected future traffic flow. However, the array of new and proposed activities throughout the Caliente rail alignment cumulative impacts region of influence would have the potential to strain parts of the existing roadway infrastructure.

Railroad project-related road traffic would result in small increases in some areas but construction of the proposed railroad itself would not materially affect traffic volumes on local roads because most construction materials would be transported using rail, and most construction employees and contractors would be housed in construction camps linked to the work site by access roads. Cumulative traffic levels in the region would likely continue to increase as overall regional growth and development occurs.

Any road improvement and maintenance responsibilities in the region of influence are handled by the Nevada Department of Transportation through a Statewide Transportation Plan and a Statewide Transportation Improvement Program. The Statewide Transportation Improvement Program includes a 3-year list of federally funded and regionally important non-federally funded transportation projects and programs consistent with the goals and strategies of the Statewide Transportation Plan. Routine highway improvements and maintenance projects for the period 2006 through 2015 have been identified for Lincoln, Nye, and Esmeralda Counties as part of the Nevada Department of Transportation planning processes. The level of cumulative traffic changes would generally not be sufficient for major upgrades of regional roads.

Overall, the proposed railroad project would have a small impact on economic development and growth, housing and community infrastructure, and traffic in the Caliente rail alignment region of influence. While there is some limited potential for induced growth impacts, the specific locations and scope of these actions is unknown at this time, and any such actions are projected to be small. Cumulative impacts to socioeconomics in the Caliente rail alignment region of influence would be small.

5.2.2.10 Occupational and Public Health and Safety

5.2.2.10.1 Nonradiological Health and Safety

Throughout the Caliente rail alignment region of influence, continuing and reasonably foreseeable activities have the potential to result in occupational injuries or fatalities including, but not necessarily limited to sources such as tripping, being cut on equipment or material, dropping heavy objects, and catching clothing in moving machine parts, and other types of accidents. Other occupational risks include biological hazards, dust and soils hazards, air quality hazards, transportation accidents, and noise hazards. Biological hazards include potential human health effects from rodent-borne diseases, soil-borne diseases, insect-borne diseases, and venomous animals. Dust and soils hazards include potential human health effects from exposure to inhalable soils and dusts containing hazardous constituents, and potential occupational encounters with unexploded ordnance.

While occupational injuries or fatalities are unavoidable with human activity, the public and private facilities within the Caliente rail alignment region of influence cumulative activity area are highly regulated. There is a substantial regulatory framework for occupational health and safety, with the Occupational Safety and Health Administration programs and regulations forming the basis for protection of workers. Through DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, the Department has prescribed the Occupational Safety and Health Act Standards that contractors are to meet in their work at government-owned, contractor-operated facilities. The Department of Labor, Bureau of Labor Statistics, measures occupational incident rates, including total recordable cases, lost workday cases, and fatalities, associated with the work environment.

There are no data on injury/illness incident rates for the Caliente rail alignment cumulative impacts region of influence, but injury/illness incidence rates in Nevada are generally higher than those in the United States as a whole. The economic segments with the highest injury/illness incidence rates in Nevada are construction and goods-producing industries.

Additional traffic is a concern with the construction phases of reasonably foreseeable projects. The construction phase of a project not only brings construction workers to the work sites, but also means an increase in slow-moving and bulky traffic involving the transportation of construction equipment. Use of trucks for hauling hazardous or other dangerous materials is also an increasing concern as traffic increases on the road network. To minimize traffic impacts at the entrance to the Yucca Mountain Site, a new interchange with U.S. Highway 95 at the site entrance has been proposed for both traffic flow and safety reasons. Increased traffic would not necessarily mean an increase in the rate of traffic accidents, but the number of accidents would increase if the rate of traffic accidents stayed the same and traffic increased. Therefore, transportation safety concerns would increase and there could be an increased workload for traffic-accident responders in the Caliente rail alignment region of influence with the cumulative growth in traffic.

An estimated 9,500 casks would be transported to the repository by rail along the Caliente rail alignment. Nonradiological occupational health and safety impacts are projected as follows:

- Construction and operations activities for the Caliente rail alignment are projected to result in approximately 880 recordable incidents, approximately 520 lost-workday accidents, and approximately three fatalities.
- Vehicular-related fatalities related to worker commuting are projected to result in an estimated 14 vehicular-related fatalities for the Caliente rail alignment.
- Rail-related accidents and rail-related fatalities related to the movement of cask trains, maintenance trains, and supply trains are projected to result in 16 rail-related accidents and two rail-related fatalities for the Caliente alignment.

Under Module 1, approximately 22,000 casks would be transported to the repository by rail and under Module 2, approximately 24,000 casks would be transported to the repository by rail. To estimate the cumulative health and safety impacts of Module 1 and Module 2, the impacts of the Proposed Action were increased by the ratio of the number of casks transported in Module 1 or Module 2 versus the Proposed Action. For Module 1, the nonradiological health and safety impacts noted above would increase by a factor of approximately 2.3 over the impacts under the Proposed Action. For Module 2, nonradiological safety impacts would increase by a factor of approximately 2.4 over the impacts under the Proposed Action.

Other regional activities would also cumulatively add to the totals beyond the railroad-related impacts, but cumulative nonradiological health and safety impacts in the Caliente rail alignment region of influence would be small within the context of the overall region of influence.

5.2.2.10.2 Radiological Health and Safety

Existing and reasonably foreseeable future activity (such as the Nevada Test Site and Yucca Mountain Repository activity managed by DOE) in the Caliente rail alignment region of influence involves the storage, handling, transportation, use, and disposal of radioactive materials and wastes. There is an extensive regulatory framework associated with transportation safety, and the proposed railroad would operate in compliance with these laws and regulations. For example, DOE complies with U.S. Department of Transportation regulations regarding the transportation of radioactive materials. DOE also uses U.S. Environmental Protection Agency protective action guides (identifying projected dose levels at which specified actions should be taken) and actions designed to limit doses and impacts in the event of a transportation accident resulting in releases of radioactive material. The regulatory framework and implementation of appropriate standard operating procedures would reduce the potential for accidents. Coordination of plans for proposed railroad construction and operation with local emergency response providers would be important to limit the potential for accidents, and for an effective response to an accident should one occur.

There is a small risk of radiological impacts to workers and the general public from external radiation exposure during normal operations and incident-free transportation. Staff at the Nevada Test Site and the Yucca Mountain Repository would be separate, and it is not anticipated that there would be cumulative exposures to workers from both operations. The modes of transportation of radioactive wastes for the Nevada Test Site (shipment by truck) and the Yucca Mountain Repository (shipment by rail) would differ. Radiological impacts associated with rail operations would be higher under Repository SEIS Module 1 or 2 operations compared to the Repository SEIS Proposed Action level of transportation. The radiological risk relationships among the repository, the proposed Caliente rail alignment, and Nevada Test Site operations is summarized below.

As part of the Repository SEIS process, DOE estimated that 9 to 28 latent cancer fatalities for members of the public would result from Yucca Mountain Repository construction, operations, monitoring, and closure for the population within the 80-kilometer (50-mile) repository region of influence. The estimated latent cancer fatalities correspond to a total collective dose of 15,000 to 46,000 person-rem, and the projected population within the repository region of influence is 120,000 persons. The region of influence for the Yucca Mountain Repository extends 80 kilometers (50 miles) to the northwest from the repository site boundary along the rail corridor, approximately to Scottys Junction; the remainder of the Caliente rail alignment is outside of the Yucca Mountain Repository region of influence. Population within the area where the rail alignment region of influence and the Yucca Mountain Repository region of influence coincide (between the repository boundary and the Scottys Junction area) would receive radiation dose from both the repository and from the railroad operations. Members of the public along the rail line but outside of the region of influence of the Yucca Mountain Repository would receive a negligible radiation dose from the repository.

For members of the public along the rail line, DOE estimated that there could be up to 1.3×10^{-4} latent cancer fatalities, corresponding to a collective population dose of 0.2 person-rem for the Caliente alignment. Therefore, for members of the public situated along the rail alignment, the radiological impacts of operation of the Caliente rail line would be a very small contribution to the overall radiological impacts of the Yucca Mountain Repository.

The estimated radiological dose to members of the public from Nevada Test Site operations in 2005 was 0.2 mrem per year; the maximum radiation dose was 2.3 mrem per year at the northwest corner of the Nevada Test Site boundary. Dose at off-site populated locations between 20 kilometers and 80 kilometers (12 to 50 miles) from this location would experience much lower radiation doses due to wind dispersion (*Nevada Test Site Environmental Report 2005,* DIRS 182285-Wills 2006, Table 8-4, p. 8-2.) The collective population dose from Nevada Test Site operations was below 0.6 person-rem in 2004 (*Nevada Test Site Environmental Report 2005,* DIRS 182285-Wills 2006, Table 8-3, p. 8-8.) Radiation dose from Nevada Test Site operations would be a very small contribution to the overall radiological impacts of the Yucca Mountain repository.

Operation of the proposed railroad along the Caliente rail alignment under the Proposed Action would result in a small contribution to cumulative radiological health and safety impacts. Cumulative radiological impacts in the Caliente rail alignment region of influence would be small.

5.2.2.11 Utilities, Energy, and Materials

5.2.2.11.1 Utilities

From a cumulative impacts perspective within the Caliente alignment region of influence, utility crossings are and will continue to be commonplace, with little impact other than minor ground disturbance. The proposed railroad project would contribute to regional utility and other right-of-way crossings, which are common to linear projects such as roads, railroads, and pipelines. Land areas for the rail line, construction camps, quarries, and access roads would cross or encroach upon existing or proposed utility rights-of-way in a variety of locations. Land areas for railroad operations support facilities could also encroach upon existing or proposed utility rights-of-way. This situation would be typical for other rights-of-way in the region, meaning that the cumulative region of influence would have hundreds of utility and other right-of-way crossings for the various existing and reasonably foreseeable projects in the region. The crossings would be accomplished with small impacts using standard engineering procedures and appropriate design details.

Many regional activities, including the proposed railroad, would increase demands on public water systems, wastewater systems, telecommunications systems, electric power systems, and other utilities. However, regional service providers are projected to be able to adjust to any increasing demand, and overall cumulative impacts to utilities would be small.

5.2.2.11.2 Energy and Materials Usage

Large projects such as pipelines, transmission lines, and power plants that could occur within the Caliente rail alignment cumulative impacts region of influence require materials and energy to construct and operate. Energy and material resources necessary for construction or operation of these projects are often obtained within regional or, in some cases, national markets.

For this Rail Alignment EIS, DOE analyzed cumulative energy and materials supply and demand from a regional perspective. Energy and materials (for example, steel and concrete) that would be needed for construction and operation of the proposed railroad are not constrained in regional markets, and proposed railroad needs would represent a small percentage of the cumulative annual materials use within the Caliente rail alignment cumulative impacts region of influence.

While the regional markets for various construction-related materials and energy sources will continue to grow as the region develops, there is no evidence of potential limits to growth from constrained material or energy supplies. Cumulative impacts from energy and materials usage in the Caliente rail alignment region of influence would be small.

5.2.2.12 Hazardous Materials and Waste

5.2.2.12.1 DOE Waste-Management Activities

DOE has had existing waste-management programs at the Nevada Test Site for several decades. While Site missions have changed over time (with an emerging focus on national security, energy, and environmental issues), waste management and disposal at the Site has been one of the primary long-term land uses. There are two active waste-management and disposal sites on the Nevada Test Site:

- Area 5 occupies 2.9 square kilometers (720 acres) and is in Frenchman Flat north of Mercury, Nevada.
- Area 3 occupies 0.53 square kilometer (130 acres) north of Mercury in Yucca Flat.

Environmental restoration efforts are under way at various locations throughout the Nevada Test Site. The Nevada Test Site waste-management program currently includes management and disposal operations for hazardous waste, mixed waste, and low-level radioactive waste. Transportation of the waste is accomplished by truck from both on-site and off-site sources. There are no plans for Nevada Test Site activities to include use of the proposed Caliente rail alignment for shipment of wastes.

The proposed railroad would not contribute to cumulative impacts associated with DOE waste-management activities on the Nevada Test Site.

At present, Yucca Mountain Repository-development efforts are focused on preparing an application to the U.S. Nuclear Regulatory Commission for authorization to construct the repository for spent nuclear fuel and high-level radioactive waste. Proposed operations at the Yucca Mountain Site are discussed in detail in the Yucca Mountain FEIS and the Repository SEIS.

5.2.2.12.2 Sanitary and Construction Wastes

As the populated areas in the Caliente rail alignment cumulative impacts region of influence expand, the volume of sanitary waste generated will also expand. Project proponents are legally required to dispose of nonhazardous and nonradiological construction and other solid waste in appropriately permitted solid waste landfills. Nevada has 24 operating municipal landfills with a combined capacity to accept more than 11,000 metric tons (12,000 tons) of waste per day. However, the number of operating landfills has decreased substantially over the past 15 years, and while there is sufficient capacity to accept waste for the state of Nevada as a whole, there are some areas, such as Pahrump, that have limited capacity for future years.

Construction- and operations-related waste that would be associated with the proposed railroad would add only a fraction of a percent to the total waste stream in the state. If there were a constraint to landfill capacity at some future time, additional land would be needed to expand or open a new landfill. Because of the scarcity of private land in the Caliente rail alignment region of influence, any land used for this purpose might need to come from BLM-administered federal land. As an alternative to local government landfill provision, private companies can also be expected to seek business opportunities to provide solid- and hazardous-waste management, transportation, and disposal.

DOE would store and use hazardous materials (such as oil, gasoline and solvents) during the construction phase, and would control and manage these materials in accordance with the extensive federal and state regulatory framework. Other major projects would have similar waste streams, and project plans and requirements would call for disposal of such wastes in permitted facilities and materials management according to accepted industry practices.

The proposed railroad's contribution to impacts from the generation and management of sanitary and construction wastes would be small. Cumulative impacts to waste disposal facilities in the Caliente rail alignment region of influence would be small.

5.2.2.13 Cultural Resources

Cultural resources include historic and archeological sites, buildings, structures, landscapes, and objects. Most reasonably foreseeable projects in the Caliente rail alignment cultural resources region of influence will involve at least some ground disturbance. With that ground disturbance, cultural resources could be destroyed, damaged, or discovered for recovery or mitigation. As part of the evaluation of proposed projects on federal land, the existing regulatory framework requires that cultural resources be identified and protected. With information on the location of a proposed project, and the estimated extent of ground disturbance, cultural resource specialists can be called on to perform appropriate surveys and inventories of cultural resources in the potentially disturbed area. Once discovered, the sites of cultural resources are kept confidential to reduce the potential for vandalism or theft of the resources.

Because cultural resources are typically on or below the ground, they can be damaged by other activities such as off-highway vehicle use. As the major land manager in the Caliente rail alignment region of influence, the BLM has an extensive cultural resource management program and manages federal land with protection of cultural resources as a key management objective. Once ground is disturbed and facilities are constructed on the land, the opportunity for identification of cultural resources is usually lost. Therefore, the BLM and other land managers in the area (like DOE on the Nevada Test Site and the U.S. Air Force on the Nevada Test and Training Range) employ cultural resource specialists and involve tribal representatives, as appropriate. Commonly, mitigation for any ground disturbance in the Caliente rail alignment region of influence includes the involvement of these cultural resource specialists as potential cultural resources are discovered. Other activities occurring on federal land, such as off-road vehicle use and rock collecting, can cause unintended adverse impacts to cultural resources. Mission activities occurring at the Nevada Test Site, the Nevada Test and Training Range, and the Yucca Mountain Repository also can cause unintended adverse impacts to cultural resources.

The problem of vandalism to and theft of cultural resources is prevalent throughout the western United States. The Draft Ely District Resource Management Plan (DIRS 174518-BLM 2005, p. 3.9-5) notes that the trend of degradation to cultural resource sites is increasing at a rapid rate as the population increases in the Caliente rail alignment region of influence. Land-management agencies such as the BLM make extensive attempts to protect cultural resource locations, but the areas to be managed are often so vast that patrols by law enforcement are not effective in protecting these sites. DOE, the BLM, and other federal agencies in the Caliente rail alignment region of influence are committed to public education and employee training regarding the protection of cultural resources.

Visitors could also be drawn to the area for purposes of curiosity and sight-seeing. Based on the extent of cultural resource site finds within BLM-administered land and the Nevada Test Site, and data collected to date on the Caliente rail alignment, there could be a large number of cultural resources in the Caliente rail alignment region of influence. For example, the Draft Ely District Resource Management Plan (DIRS 174518-BLM 2005, p. 3.9-1) notes that approximately 12,000 cultural resource sites covering a time span of more than 10,000 years have been identified within the Ely District. It is likely that only a portion of any currently undiscovered sites would ultimately be found eligible for the *National Register of Historic Places*.

The railroad would be a major new construction project introduced into a remote area. Beyond the implications of ground disturbance and permanent and temporary use areas, railroad construction and operations would bring employees, visitors, and equipment into an area where prior access was limited. If right-of-way roads remain open to the public, there could be an increase in off-road vehicles traveling along newly constructed roads and illegal use of lands. As the number of visitors increases, so does the potential for vandalism and damage to cultural resources. There is an extensive regulatory framework to manage and protect cultural resources.

Impacts to cultural resources in the Caliente rail alignment region of influence would be small because the Department would conduct intensive field surveys and implement mitigation measures, including avoidance. Other project proponents would be subject to the same regulatory framework and BLM policies and procedures. Cumulative impacts to cultural resources in the Caliente rail alignment region of influence would be small.

5.2.2.14 Paleontological Resources

Regional protection, management, and impact issues in relation to paleontological resources are similar to those for cultural resources. Any type of ground disturbance could disturb or destroy known or yet identified paleontological resources. Impacts to paleontological resources would generally be measured by physical damage to fossil-bearing formations through excavation or surface disturbance. The primary cumulative impact mechanisms that could affect paleontological resources include excavations or surface disturbances associated with approval and implementation of BLM rights-of-way, off-highway vehicle use, minerals development, land disposals, and special designations. Many BLM management activities, however, serve to protect and mitigate impacts to paleontological resources. As noted in the Draft Ely District Resource Management Plan (DIRS 174518-BLM 2005, p. 4.10-1), knowledge of the outcrop pattern of geologic units, and the kinds and quality of the fossils produced by such units, is a critical management tool for land-use decisionmaking where fossils might be involved. Potential effects on paleontological resources from ground disturbance would continue to be a major regional concern for the BLM from both resource management planning and rights-of-way evaluation perspectives.

Paleontological resources are considered valuable and are collected in the Caliente rail alignment region of influence for their cultural, scientific, and recreational values. Therefore, these resources are sometimes removed from federal lands. While common invertebrate fossils such as plants, mollusks, and trilobites can be collected for personal use in reasonable quantities, the lack of regular site monitoring and public education about fossil collecting has led to increased illegal commercial taking of paleontological resources. Paleontological resources are also vulnerable to intentional or unintentional vandalism. The specific locations of some identified paleontological resources are kept confidential to avoid vandalism or theft.

The most likely locations of currently unknown paleontological resources can be identified based on geological characteristics, and potential impacts can be avoided or minimized through careful project planning and implementation. Most formations the rail line would cross are volcanic and would not contain paleontological resources. Therefore, the proposed railroad project would not contribute to cumulative impacts to paleontological resources.

5.2.2.15 Environmental Justice

5.2.2.15.1 Potential Effects to Low-Income or Minority Populations

Environmental justice impacts result when high and adverse human health or environmental impacts fall disproportionately on low-income and minority populations. If high and adverse impacts are found to have disproportionate impacts on environmental justice populations as compared to the general population in the area, the impacts would be mitigated to the extent practicable by the federal agencies involved in the proposed action.

Based on individual and group values, beliefs, and goals among stakeholders and other interested parties, there are different perspectives on the potential effects of activities in the Caliente rail alignment region of influence on low-income or minority populations. The American Indian Resource Document (DIRS 174205-Kane et al. 2005) discusses cultural resources, American Indian values and their relationship to environmental justice, and broader American Indian values. DOE considers the American Indian Writers Subgroup conclusions to be responsible opposing viewpoints for purposes of its environmental justice responsibilities.

DOE has concluded that there are no identifiable human health or environmental impacts associated with the proposed railroad that would disproportionately affect low-income or minority populations, nor has the Department identified any special pathways for impacts (such as subsistence hunting and gathering) in the Caliente region of influence.

Cumulative impacts to low-income or minority populations along the Caliente rail alignment would be would be small, if any.

5.2.2.15.2 Economic Opportunity

Existing and reasonably foreseeable projects and activities in the Caliente rail alignment region of influence would present economic opportunities for some people in the area. Economic opportunities include employment, wages, revenue from business operation, and other economic stimuli associated with growth and development. DOE and other project proponents in the Caliente rail alignment region of influence have a legally mandated equal opportunity approach to these economic opportunities. Any potential for economic gain would be distributed equally to people or businesses in the area that seek employment or business opportunity.

While not all people would gain economically from the cumulative group of projects and activities, the opportunity for gain does not favor one population group or another based on minority or income status.

5.3 Mina Rail Alignment

Sections 5.3.1 to 5.3.2 summarize the projects and activities considered in the cumulative impacts analysis for the Mina rail alignment. Figure 5-3 shows the locations of these major projects and activities, including the:

1. Naval Air Station Fallon
2. Federal actions on the Walker River Paiute Reservation
3. Hawthorne Army Depot
4. Walker River Basin Restoration
5. Monte Cristo's Castle (proposed state park)
6. Timbisha Shoshone Trust Land (federal land transfer)
7. Yucca Mountain Geologic Repository
8. Nevada Test Site
9. Nevada Test and Training Range

This section also considers other relevant projects and actions that are not depicted on the map, such as:

- BLM planning and management actions – A variety of BLM past, present, and reasonably foreseeable actions are located within the three BLM management areas (Carson City, Battle Mountain, and Las Vegas) relevant to the Mina rail alignment.
- Various rights-of-way – Many future utility or other rights-of-way corridors are not depicted in Figure 5-3 because specific routes are not known. For example, DOE and the BLM are preparing a programmatic environmental impact statement for potential designation of energy corridors on federal land in western states (70 *FR* 56647, September 28, 2005).
- Energy and mineral development activities.
- Other regional economic development plans and activities within Nye, Esmeralda, Lyon, and Mineral Counties.

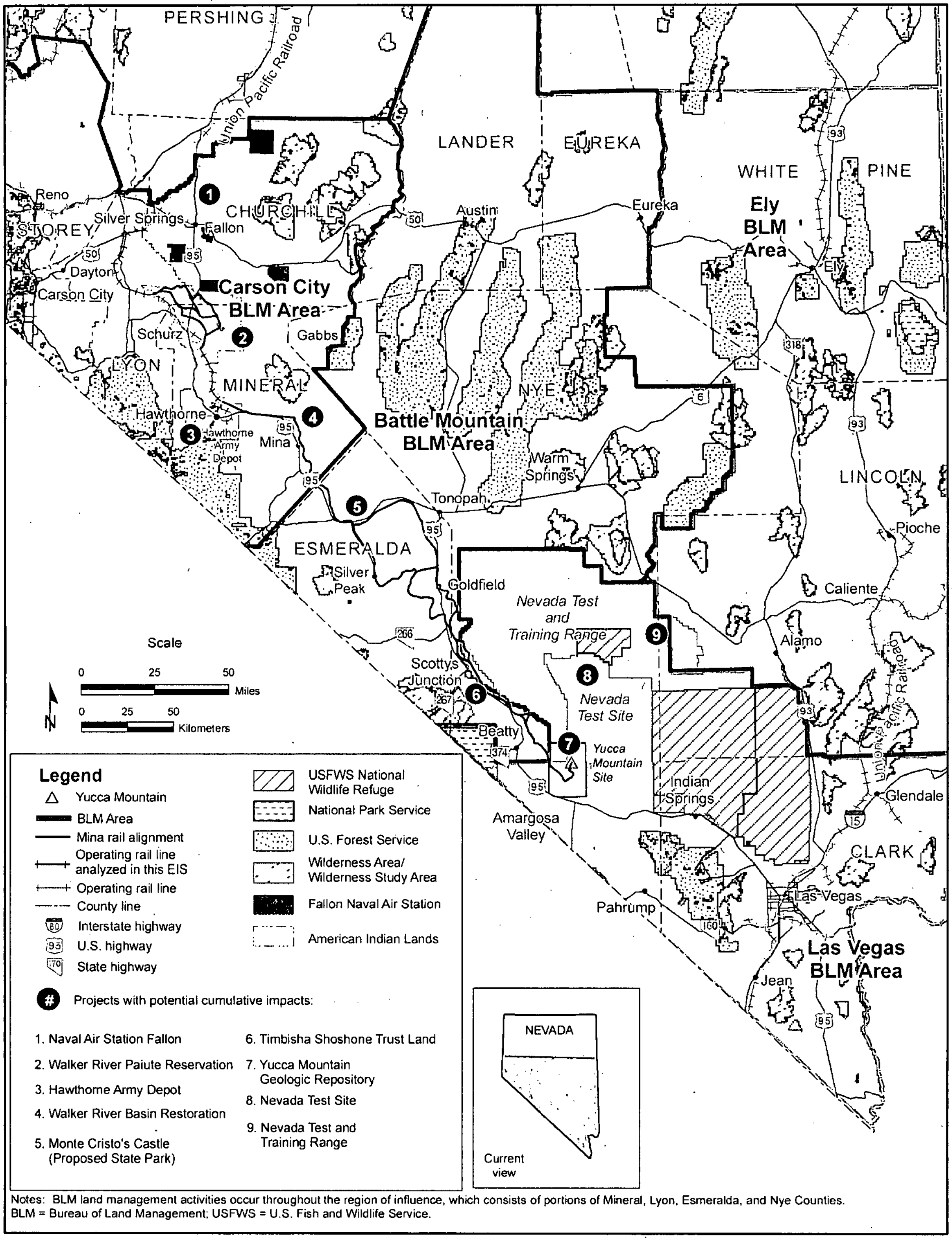

Figure 5-3. Major reasonably foreseeable future actions and continuing activities in the Mina rail alignment cumulative impacts region of influence.

The Mina rail alignment ranges in length from about 469 to 502 kilometers (281 to 312 miles), depending on the alternative segments considered. As a linear project, land disturbance and other direct impacts would be most likely to occur within the relatively narrow construction and operations rights-of-way. However, there could be other direct and indirect impacts for some resources outside the rights-of-way.

To evaluate the potential for cumulative impacts, DOE identified and reviewed public and private actions in the Mina rail alignment region of influence to determine if the impacts associated with these actions could coincide in time or space with potential impacts from railroad construction and operations along the Mina rail alignment. Only those projects and activities DOE believes would have the potential for cumulative impacts are identified herein. In some cases, similar actions have been grouped together and listed by category of action.

5.3.1 PROJECTS AND ACTIVITIES INCLUDED IN THE CUMULATIVE IMPACTS ANALYSIS – MINA RAIL ALIGNMENT

5.3.1.1 Past and Present Actions

The descriptions of existing (baseline) environmental conditions (Chapter 3) and impacts (Chapter 4) associated with the various environmental resource regions of influence for the Mina rail alignment considered in this Rail Alignment EIS include the relationships between proposed railroad construction, operation, and abandonment and past and present actions such as:

- Operations at major federal facilities such as the Yucca Mountain Geologic Repository, Nevada Test and Training Range, Nevada Test Site, Hawthorne Army Depot, and Naval Air Station Fallon
- BLM resource management planning and land management uses
- Traditional land uses such as regional ranching, mining, and recreation
- Military operations
- Walker River Basin restoration activities
- Residential, commercial, and industrial development activities associated with growth in the Mina rail alignment cumulative impacts region of influence; including the Pahrump area and the Reno-Carson City area adjacent to the northern portion of the Mina rail alignment region of influence.

Reasonably foreseeable future actions and the continuation of existing actions in the Mina rail alignment cumulative impacts region of influence were also considered. Figure 5-3 shows the locations of individual projects and activities.

5.3.1.2 Reasonably Foreseeable Future and Continuing Federal Actions

Sections 5.3.1.2.1 through 5.3.1.2.8 describe reasonably foreseeable future and continuing federal agency actions that could result in cumulative impacts when combined with the impacts of constructing and operating a railroad along the Mina rail alignment.

5.3.1.2.1 Yucca Mountain Geologic Repository

The Proposed Action in this Rail Alignment EIS is directly related to the proposed geologic repository at Yucca Mountain, which is a reasonably foreseeable project that would have potential cumulative impacts in the Mina rail alignment region of influence (see Figure 5-3, Project #7). In the Yucca Mountain FEIS

(DIRS 155970-DOE 2002, all) and the *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (the Repository SEIS; DOE/EIS-0250F-S1 DOE proposes to construct, operate and monitor, and eventually close a geologic repository for the disposal of 70,000 metric tons (77,000 tons) of heavy metal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain in Nye County, Nevada. DOE proposed to dispose of spent nuclear fuel and high-level radioactive waste in the repository using the natural geologic features of the mountain and engineered barriers as a total system to help ensure long-term isolation of the materials from the accessible environment. As analyzed in the Repository SEIS, the repository design and associated construction and operation plans require the following:

- DOE spent nuclear fuel and high-level radioactive waste would be placed in disposable canisters at the DOE sites, and as much as 90 percent of the commercial spent nuclear fuel would be placed in transportation, aging, and disposal (TAD) canisters at the commercial sites prior to shipment. The remaining commercial spent nuclear fuel (about 10 percent) would be transported to the repository in dual-purpose canisters (canisters suitable for storage and transportation), or would be uncanistered.

- Most spent nuclear fuel and high-level radioactive waste would be transported from 72 commercial and four DOE sites to the repository in Nuclear Regulatory Commission-certified transportation casks placed on trains dedicated only to these shipments. Some shipments, however, would be transported to the repository by truck over the Nation's highways.

- At the repository, DOE would conduct waste handling activities to manage thermal output of the commercial spent nuclear fuel and to package the spent nuclear fuel into TAD canisters. The disposable canisters and TAD canisters would be placed into waste packages for disposal in the repository. A waste package is a container that consists of the barrier materials and internal components in which DOE would place the canisters that contained spent nuclear fuel and high-level radioactive waste.

- DOE would place approximately 11,000 waste packages, containing no more than a total of 70,000 metric tons (77,000 tons) of heavy metal, of spent nuclear fuel and high-level radioactive waste in the repository at Yucca Mountain.

- When authorized by the Nuclear Regulatory Commission, the repository would be closed permanently. The design for construction would allow for phased construction of the surface and subsurface facilities that would be compatible with constrained funding.

- The surface and subsurface facilities and associated infrastructure, such as the onsite road and water distribution networks and emergency response facilities, would be constructed in phases to accommodate the expected receipt rates of spent nuclear fuel and high-level radioactive waste.

- DOE also would construct a four-lane access road that would extend from U.S. Highway 95 to the existing access road at Gate 510. This access road might be constructed using a phased approach, with initial construction of two lanes, and the road being widened later. The Department would also build a suitable intersection at U.S. Highway 95.

- DOE assumes that the following facilities would be constructed outside the repository land withdrawal area: a training facility near Yucca Mountain to support the Project Prototype Testing and the Operator Training and Qualification programs; temporary accommodations for construction workers; a proposed Sample Management Facility to consolidate, upgrade, and improve storage and warehousing for scientific samples and materials, perhaps near the Town of Amargosa Valley; and a marshalling yard and warehouse, a proposed leased facility that would consolidate material shipment and receipt into a 0.2-square-kilometer (50-acre) facility to allow for offsite receipt, transfer, and staging of materials required to perform construction activities at the Yucca Mountain site.

The Nuclear Regulatory Commission, through its licensing process, would regulate repository construction, operation and monitoring, and closure. Repository operations would only begin after the Commission granted DOE a license to receive and possess spent nuclear fuel and high-level radioactive waste. DOE is currently preparing an application for construction authorization.

The Yucca Mountain FEIS and the Repository SEIS evaluate the cumulative impacts of two additional inventories (Modules 1 and 2), which include spent nuclear fuel and high-level radioactive waste in addition to that of the Proposed Action inventory, and other radioactive wastes generally considered unsuitable for near-surface disposal. Inventory Module 1 or 2 could have cumulative impacts on the operation of the proposed railroad. Regarding potential cumulative impacts from Inventory Module 1 or 2, there would be no cumulative construction impacts because the need for a new railroad would not change; that is, whichever rail alignment DOE selected in which to build the proposed railroad to serve the Yucca Mountain FEIS Proposed Action would also serve Module 1 or 2. In addition, because the planned annual shipment rate of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository would be about the same for Module 1 or 2 and the FEIS Proposed Action, the only cumulative operations impacts would result because of the annual increase of shipments for Module 1 or 2. Because Modules 1 and 2 exceed the NWPA disposal limit of 70,000 metric tons (77,000 tons) of heavy metal considered in the Repository SEIS, the emplacement of any such waste at Yucca Mountain would require legislative action by Congress unless a second licensed repository was in operation. The 70,000 metric tons of heavy metal limit is comprised of 63,000 metric tons (69,000 tons) of heavy metal from commercial utilities and 7,000 metric tons (7,000 tons) of heavy metal from DOE.

DOE is preparing the *Disposal of Greater-Than-Class-C Low-Level Radioactive Waste Environmental Impact Statement* (DOE/EIS-0375) (72 *FR* 40135, July 23, 2007). That EIS will address the disposal of wastes with concentrations greater than Class C, as defined in U.S. Nuclear Regulatory Commission regulations at 10 CFR Part 61, and DOE Low-Level Radioactive Waste and transuranic waste having characteristics similar to Greater-Than-Class-C waste and that otherwise do not have a path to disposal. DOE proposes to evaluate alternatives for Greater-Than-Class-C low-level waste disposal in a geologic repository; in intermediate depth boreholes; and in enhanced near surface facilities. Candidate locations for these disposal facilities are the Idaho National Laboratory; the Los Alamos National Laboratory and Waste Isolation Pilot Plant in New Mexico; the Nevada Test Site and the proposed Yucca Mountain Repository; the Savannah River Site in South Carolina; the Oak Ridge Reservation in Tennessee; and the Hanford Site in Washington. DOE will also evaluate disposal at generic commercial facilities in arid and humid locations. The Draft Yucca Mountain SEIS evaluates the potential cumulative impacts of disposal of these wastes at Yucca Mountain as a reasonably foreseeable action, which are included in Inventory Module 2. Current repository design plans do not accommodate disposal of Greater-Than-Class-C low-level radioactive waste.

DOE is preparing the *Programmatic Environmental Impact Statement for the Global Nuclear Energy Partnership* (DOE/EIS-0396). Global Nuclear Energy Partnership (GNEP) would encourage expansion of domestic and international nuclear energy production while reducing nuclear proliferation risks, and reduce the volume, thermal output, and radiotoxicity of spent nuclear fuel before disposal in a geologic repository. DOE anticipates that its Programmatic EIS will evaluate a range of alternatives, including a proposal to recycle spent nuclear fuel and separate many of the high-heat fission products and the uranium and transuranic components. The full implementation of GNEP would involve the construction and operation of advanced reactors, which would be designed to generate energy while destroying the transuranic elements. DOE also anticipates evaluating project-specific proposals to construct and operate an advanced fuel-cycle research facility at one or more DOE sites.

The United States uses a "once through" fuel cycle in which a nuclear power reactor uses nuclear fuel only once, and then the utility places the spent nuclear fuel in storage while awaiting disposal. GNEP would establish a fuel cycle where the uranium and transuranic materials would be separated from the spent nuclear fuel and reused in thermal and/or advanced nuclear reactors. GNEP would not diminish in any way the need for the nuclear waste disposal program at Yucca Mountain, because under any fuel recycle scenario, high-level radioactive waste will continue to be produced and require disposal.

DOE anticipates that by about 2020 the commercial utilities will have produced about 86,000 metric tons 995,000 tons) of heavy metal of spent nuclear fuel, which exceeds the DOE disposal limit of 63,000 metric tons (69,000 tons) of heavy metal of commercial spent nuclear fuel at the Yucca Mountain Repository. If DOE were to decide, in a GNEP Record of Decision, to proceed with its proposal to recycle spent nuclear fuel, the Department anticipates that the necessary facilities would not commence operations until 2020 or later. Although the spent nuclear fuel-recycling concept has not yet been implemented and the capacity of a separations facility has not been determined, one or more separations facilities could be designed with a total capacity sufficient to recycle the spent nuclear fuel discharged by commercial utilities. Consequently, the Department believes there would be no change in the spent nuclear fuel and high-level radioactive waste inventory, and therefore the number of casks of spent nuclear fuel and high-level radioactive waste shipped to the Yucca Mountain repository analyzed under the Proposed Action in this Rail Alignment EIS would remain unchanged (that is, the shipment of approximately 9,500 casks containing spent nuclear fuel and high-level radioactive waste).

Overall, development of a GNEP fuel cycle has the potential to decrease the amount (number of assemblies) of spent nuclear fuel that would require geologic disposal, but would increase the number of casks of high-level radioactive waste requiring disposal in a geologic repository in the long term. Consequently, recycling of commercial spent nuclear fuel could affect the nature of the inventory that represents the balance of Inventory Module 1 (that is, commercial spent nuclear fuel in amounts greater than 63,000 metric tons [69,000 tons] of heavy metal). Nevertheless, given the uncertainties inherent at this time in estimating the amount of spent nuclear fuel and high-level radioactive waste that would result from a full or partial implementation of the GNEP closed fuel cycle, this Rail Alignment EIS analyzes rail transportation within Nevada of approximately 9,500 casks of spent nuclear fuel and high-level radioactive waste.

5.3.1.2.2 Nevada Test Site (Continuation of Activities)

The Nevada Test Site, adjacent to the Nevada Test and Training Range, engages in a number of defense-related material and management activities, waste management, environmental restoration, and non-defense research and development (see Figure 5-3, Project #8). The Nevada Test Site was established in 1951 as the Nation's proving ground for developing and testing nuclear weapons. The site is on land administratively held by the BLM, but the Nevada Test Site land was withdrawn for use by the Atomic Energy Commission and its successors (including DOE). At present, the DOE National Nuclear Security Administration manages the site. It consists of about 3,200 square kilometers (800,000 acres) of land.

The *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 101811-DOE 1996, all) described existing and projected future actions at the Nevada Test Site. That EIS was followed by a *Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DIRS 162638-DOE 2002, all). DOE activities at the Nevada Test Site include stockpile stewardship and management (helping ensure the U.S. nuclear weapon stockpile is safe, secure, and reliable), materials disposition (removal of nuclear materials in a safe and timely manner), and nuclear emergency response. Activities at the Nevada Test Site since the 1996 EIS and 2002 supplement analysis have continued to support these missions in accordance with federal law, DOE policies and missions, and NEPA requirements. There are a number of other programmatic DOE waste management initiatives that can affect current and potential future operations at the Nevada Test Site, many of which require NEPA analyses. The Nevada Test Site also produces annual environmental reports that describe program activities and related environmental issues and activities.

DOE is currently preparing the *Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement–Complex 2030* (Complex Transformation Supplemental PEIS [formerly known as the Complex 2030 SEIS]; DOE/EIS-0236-S4). That SEIS will analyze the environmental impacts of the continued transformation of the United States nuclear weapons complex by implementing the National Nuclear Security Administration's vision of the complex as it would exist in 2030, and alternatives to that action. Part of the proposed action in that SEIS is to identify one or more sites for conducting National Nuclear Security Administration flight test operations. Existing Department of Defense and DOE test ranges (for example, the White Sands Missile Range in New Mexico and the Nevada Test Site in Nevada) would be considered as alternatives to the continued operation of the Tonopah Test Range in Nevada.

Another part of the proposed action in the Complex Transformation Supplemental PEIS is to accelerate dismantlement activities. The DOE sites that will be considered as potential locations for the consolidated plutonium centers and consolidation of Category I (high strategic significance) and II (moderate strategic significance) special nuclear materials include Los Alamos National Laboratory, the Nevada Test Site, the Pantex Plant, the Y-12 National Security Complex, and the Savannah River site.

DOE manages several types of radioactive and hazardous waste (***low-level radioactive waste***, ***mixed low-level waste*** [referred to as mixed waste], transuranic waste, high-level radioactive waste, and ***hazardous waste***) generated by past and present nuclear defense research activities at many DOE sites across the United States, including the Nevada Test Site. The Department manages each of those waste types separately because they have different components, levels of radioactivity, and regulatory requirements. DOE needs facilities like the Nevada Test Site to manage its radioactive and hazardous wastes to maintain safe, efficient, and cost-effective control of these wastes; comply with applicable federal and state laws; and protect public health and safety and the environment. In *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DIRS 101816-DOE 1997, all) DOE evaluated the environmental impacts of managing the five waste types. The Nevada Test Site will continue to be a major facility involved in DOE waste-management programs, including serving as a disposal site for certain waste types generated off the site, and for on-site wastes primarily from environmental restoration and remediation activities.

The Nevada Test Site is a candidate disposal location for Greater-Than-Class-C Low-Level Radioactive Waste which is currently being examined in the *Disposal of Greater-Than-Class-C Low-Level Radioactive* Waste *Environmental Impact Statement* (DOE/EIS-0375). That DOE EIS will address the disposal of wastes with concentrations greater than Class C, as defined in Nuclear Regulatory Commission regulations at 10 CFR Part 61, and DOE low-level radioactive waste and transuranic waste having characteristics similar to Greater-Than-Class-C low-level waste and that might not have an identified path to disposal. DOE proposes to evaluate alternatives for Greater-Than-Class-C low level waste disposal in a geologic repository; in intermediate-depth boreholes; and in enhanced near-surface facilities.

Table 5-1 lists and briefly describes recent environmental assessments that describe Nevada Test Site operations.

5.3.1.2.3 BLM Resource Planning and Management

The presence of public land administered by the BLM is a very important factor affecting how and where activities occur within the region of influence. Many private and federal projects in the regions of influence, including the proposed railroad, would involve use of BLM-administered federal land. Therefore, these projects would require BLM-issued right-of-way grants before they could proceed. Right-of-way grants have two general forms: linear (applicable to such projects as transmission lines, railroads, and pipelines), and non-linear (applicable to projects at one specific location). Rights-of-way on BLM-administered land are extensive in the region. These rights-of-way vary tremendously in size and scope of activity.

Similar to the Caliente rail alignment, the BLM also administers most of the public lands along the proposed Mina rail alignment. The BLM manages these lands through a multiple-use concept (which means managing public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people) in accordance with the Federal Lands Policy and Management Act of 1976 (43 U.S.C. 1732, et seq.) and other federal legislation. The proposed Mina rail alignment would cross three BLM planning areas (Carson City, Battle Mountain, and Las Vegas). The Carson City Field Office manages its federal lands through a Consolidated Resource Management Plan developed in 2001. The Carson City Field Office was previously divided into eight planning units, all of which were consolidated into the 2001 Carson City Resource Management Plan. The Battle Mountain and Las Vegas planning areas are operating under resource management plans adopted in 1998 and 1997, respectively (DIRS 176043-BLM 1998, all; DIRS 173224-BLM 1997, all). There are many land uses on BLM-administered federal land in the region of influence, with grazing use being a major source of activity.

As directed by Federal legislation, the BLM Carson City Field Office may issue leases for geothermal resources located in multiple areas within the Mina rail alignment cumulative impacts region of influence. The development of any geothermal resources would be guided by BLM land and resource management policies and procedures established in the applicable resource management plans.

5.3.1.2.4 Walker River Paiute Reservation (Federal Actions)

The Walker River Paiute Reservation consists of more 130 square kilometers (323,000 acres) of land between Yerington, Nevada, and Walker Lake (See Figure 5-3, Project #2). Although the Reservation is recognized as a sovereign entity under the non-federal actions discussion below, federal agencies could also be taking actions on the reservation. The Bureau of Indian Affairs operates the Weber Dam and Weber Reservoir, which impounds water from the Walker River just north of the community of Schurz for use on the Reservation. Constructed in the 1930's, the dam needs several repairs and modifications to address a number of deficiencies identified as a result of inspections and a safety analysis conducted in the 1980s under the Bureau of Indian Affairs Dam Safety Maintenance and Repair Program, created as part of the Indian Dams Safety Act. Additionally, the U.S. Fish and Wildlife Service is involved in recovery efforts for the threatened Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*). Lahontan cutthroat trout are stocked in Walker Lake and occur in the Walker River upstream to Weber Reservoir. Weber Dam currently blocks movement further upstream, and prevents spawning by cutthroat trout; however, in the near future a fish ladder might be developed at that dam to allow fish movement. Re-establishment of a self-sustaining population of Lahontan cutthroat trout in the Walker River system is a prerequisite for recovery of this species (see also Sections 5.3.1.3.1 and 5.3.1.3.4 below).

5.3.1.2.5 Nevada Test and Training Range (Continuation of Activities)

The U.S. Air Force operates the Nevada Test and Training Range in south-central Nevada (see Figure 5-3, Project #9), a national test and training facility for military equipment and personnel consisting of approximately 12 million square kilometers (3 million acres). Military training maneuvers and jet aircraft are commonly visible in the Mina rail alignment cumulative impacts region of influence. In 2005, the U.S. Air Force designated the Indian Springs Air Force Auxiliary Airfield to Creech Air Force Base and expanded its mission and infrastructure to play a major role in the war on terrorism. The base is home to two key military operations: the MQ-1 unmanned aerial vehicle and the Unmanned Aerial Vehicle Battle laboratory.

The 1,600-square-kilometer (390,000-acre) BLM-administered National Wild Horse Management Area is within the boundary of the Nevada Test and Training Range. More than 3,200 square kilometers (800,000 acres) of the Nevada Test and Training Range comprise the Desert National Wildlife Range. The U.S. Air Force and the U.S. Fish and Wildlife Service jointly manage this area.

In *Renewal of the Nellis Air Force Range Land Withdrawal: Legislative Environmental Impact Statement* (DIRS 103472-USAF 1999, all), the U.S. Air Force addressed potential environmental consequences of extending the land withdrawal in order to continue using the Nevada Test and Training Range lands for military use. Activities at the Nevada Test and Training Range change, as necessary, to meet military test and training needs.

In 2004, the BLM prepared a resource management plan for about 8,900 square kilometers (2.2 million acres) of withdrawn public lands within the Nevada Test and Training Range (DIRS 178102-BLM 2004, all). The plan guides the management of the affected Nevada Test and Training Range natural resources 20 years into the future (2024). The decisions, directions, allocations, and guidelines in the plan are based on the primary use of the withdrawn area for military training and testing purposes.

See Table 5-2 for a list and brief description of recent environmental assessments that describe Nevada Test and Training Range operations.

5.3.1.2.6 Hawthorne Army Depot

The Hawthorne Army Depot occupies approximately 590 square kilometers (147,000 acres) in Mineral County, Nevada (see Figure 5-3, Project #3). Hawthorne Army Depot was commissioned in 1930 as a Naval Ammunition Depot, transferred to the Army in October 1977, and renamed Hawthorne Army Ammunition Plant. It was converted to a government-owned, contactor-operated installation in December 1980. In 1994, the name changed back to the Hawthorne Army Depot. Control of Hawthorne Army Depot is maintained by the U.S. Army, which is responsible for the plans, installation, operation, and equipment of the Depot. The mission of Hawthorne Army Depot is to support the Army, Air Force, and Navy. It also has the capabilities to receive, maintain, store, and issue ammunition and explosive ordnance items. The Hawthorne Army Depot also has the responsibility to renovate, recover, or dispose of unserviceable ammunition and explosives. These latter operations are referred to as demilitarization activities.

The primary ordnance areas at Hawthorne Army Depot extend over 400 square kilometers (100,000 acres) that cross U.S. Highway 95. This area is surrounded on its northeast, east, south, and west sides by fencing and on its north and northwest sides by a boundary line that includes a portion of Walker Lake. The southern one-third of Walker Lake is within the ordnance area. The Mount Grant watershed is in the northwest part of the installation. This watershed consists of about 180 square kilometers (45,000 acres), and is a resource that Hawthorne Army Depot maintains to supply its primary potable water needs. Hawthorne Army Depot has 2,572 buildings and structures, which are comprised of offices, production buildings, ammunition storage magazines, and warehouses. The Depot is bordered by public grazing lands administered by the BLM, and the installation completely surrounds the town of Hawthorne. Hawthorne Army Depot is planning to construct a rail siding, known as the Wabuska Spur, which would increase the Depot's outloading capacity.

5.3.1.2.7 Naval Air Station Fallon

Naval Air Station Fallon is in the Lahontan Valley of west-central Nevada, approximately 113 kilometers (70 miles) east of Reno and 10 kilometers (6 miles) southeast of the city of Fallon (See Figure 5-3, Project #1). Naval Air Station Fallon administers approximately 32 square kilometers (7,900 acres) of withdrawn and acquired land associated with the air station and approximately 95 square kilometers (234,000 acres) of land associated with the Fallon Range Training Complex. The Fallon Range Training Complex airspace overlies portions of Washoe, Lyon, Churchill, Pershing, Mineral, Nye, Lander, and Eureka Counties, most of which is BLM-administered public land.

In January of 2000, the Navy and BLM issued the *Final Environmental Impact Statement: Proposed Fallon Range Training Complex Requirements Naval Air Station Fallon, Nevada* (DIRS 182891-Department of the Navy, BLM 2000, all). The Naval Strike and Air Warfare Center at Naval Air Station Fallon proposes to implement changes at the Fallon Range Training Complex to meet Chief of Naval Operations mandated training requirements resulting from the real world threat environment. The proposed changes would allow the Navy to update and consolidate Navy training on public and Navy-administered lands and to update existing airspace overlying these lands. The changes evaluated in the EIS include developing new fixed and mobile electronic warfare sites, developing new tracking instrumentation subsystem sites, developing additional targets at two of its training ranges, laying fiber optic cable to two training ranges, utilizing Navy-administered lands in Dixie Valley for close-air-support training, performing Hellfire missile and high altitude weapons delivery training at two of its training ranges, and changes to special-use airspace. The EIS provided a comprehensive evaluation of the environmental impacts, including cumulative impacts, associated with the Navy's proposed changes.

5.3.1.2.8 Timbisha Shoshone Trust Land (Federal Action)

The Secretary of the Interior issued a draft report to Congress (DIRS 103470-Timbisha Shoshone Tribe [n.d.], all) describing a plan to establish trust lands for people of the Timbisha Shoshone Tribe in portions of the Mojave Desert in eastern California and southwestern Nevada (See Figure 5-3, Project #6). On November 1, 2000, the President signed Bill S. 2102 (Public Law 106-423) to provide a permanent land base for the Timbisha Shoshone Tribe within its ancestral homeland in five separate parcels. Lands in the designated area for tribal purposes were then identified, including land parcels containing water rights. The parcel near Scottys Junction (about 11 square kilometers [2,800 acres]) is approximately 3.2 kilometers (2 miles) from the proposed Mina rail alignment. The Timbisha Shoshone Tribe is actively evaluating economic development opportunities on this Scottys Junction parcel. The locations and nature of these future development opportunities are not known and are not considered to be reasonably foreseeable for the purpose of this analysis.

5.3.1.3 REASONABLY FORESEEABLE FUTURE NON-FEDERAL ACTIONS

Non-federal and private actions in the Mina rail alignment cumulative impacts region of influence primarily involve mineral resource development projects, Walker River Paiute Tribal activities, and some residential and general economic development initiatives and efforts. As previously noted, many of these privately sponsored projects would interact with the BLM land management policies and procedures through the need to acquire right-of-way grants to initiate proposed activities on BLM-administered land.

5.3.1.3.1 Walker River Paiute Reservation

The Walker River Paiute Reservation consists of over 130 square kilometers (323,000 acres) of land between Yerington, Nevada and Walker Lake (see Figure 5-3, Project #2). The 2000 census reported a population of 853 people residing on the Reservation. The rural community of Schurz is the only community within the boundaries of the Reservation. Land use on the Reservation consists primarily of open range used for cattle grazing or other agricultural activities. The Department of Defense Branchline from Wabuska extends south through the Reservation to its termination point at the Hawthorne Army Depot.

5.3.1.3.2 Power Plants, Transmission Lines, Pipelines, and Other Infrastructure

There are transmission lines, pipelines, and telecommunications infrastructure within the Mina rail alignment cumulative impacts region of influence, which holds the potential for wind, solar, and geothermal energy development, although the magnitude and specific locations of these energy development projects are not known. As indicated in Section 5.3.1.2.6, the BLM may issue geothermal leases within the Mina rail alignment region of influence. The approval of any leases and subsequent development of geothermal resources would be subject to environmental review and would be guided by BLM resource management plans.

The BLM has designated certain corridors in the area that should be used for most utility purposes; however, use of other BLM-administered land requiring new right-of-way grants has traditionally been considered on a case-by-case basis. As previously noted, the DOE and BLM Energy Corridor programmatic EIS (70 *FR* 56647, September 28, 2005) is an attempt to identify appropriate right-of-way corridors throughout the western United States, including Nevada. This effort could influence the location of rights-of-way in the Mina rail alignment cumulative impacts region of influence in future years.

5.3.1.3.3 Mining

The Mina rail alignment cumulative impacts region of influence contains a variety of mineral resources, with mining claims filed in accordance with BLM requirements and several operating mines. Establishment of mining claims on federal land do not necessarily ever lead to actual development of mining operations on those sites. Major cumulative impact issues involving mining projects include potential land-use conflicts and wastes from operations. Mineral resource locations of note within the region of influence include:

- Nevada Western Silica Corporation holds mining claims for a large, high grade silica deposit near Lida Junction, south of Goldfield in Esmeralda County. There are at least 24 million cubic meters (32 million cubic yards) of silica on site. Both the Caliente and Mina rail alignments pass within 2.4 kilometers (1.5 miles) of the claims.
- Chemetall Foote Corporation runs an operation in Silver Peak, Nevada, that mines lithium carbonate. The company pumps lithium-rich groundwater to the ground surface and then collects the lithium powder as the water evaporates. Chemetall Foote Corporation pumps the groundwater on to dry lake beds in the Clayton Valley to facilitate the evaporation process. Once removed from the water, the raw lithium material is processed in an on-site plant into market-ready, lithium containing products.
- Metallic Ventures Gold holds mining claims near Goldfield in an historic district that produces high-grade gold. The project is currently in the pre-feasibility stage of development.

Mining activities are expected to continue within the Mina rail alignment cumulative impacts region of influence. Mining activities are heavily regulated and must comply with all applicable environmental laws, rules, and regulations. The BLM has an extensive regulatory framework for mineral resource development on federal lands that strives to balance mining activities and mineral extraction with other resource management goals.

5.3.1.3.4 Walker River Basin Restoration

The decline in water quality throughout the Walker River Basin, particularly in Walker Lake, and concerns related to the Lahontan cutthroat trout, have resulted in organized restoration efforts throughout the basin (See Figure 5-3, Project #4). Walker Lake water levels have dropped substantially since the late 1800s. In addition to the declining water level, levels of total suspended solids have also increased in Walker Lake. The increasing total dissolved solid levels along with other physical, biological, and chemical conditions in the watershed and lake have stressed fisheries and other aquatic life in the lake changing the resident fish population. The Walker Lake Working Group is a nonprofit organization building public support for developing a long-term solution to protect the lake without jeopardizing the upstream community. The Group has developed a restoration strategy focused on three objectives: (1) reestablishment of spawning runs of the Lahontan cutthroat trout; (2) providing sufficient water so that levels of total dissolved solids are low enough to support the Walker Lake ecosystem; and (3) acquiring and transferring water rights for environmental and recreational purposes.

5.3.1.3.5 Monte Cristo's Castle (Proposed State Park)

In 2005, a new state park was proposed near Blair Junction (See Figure 5-3, Project #5). If approved, the park would be known as Monte Cristo's Castle and would highlight the unique geology of the area. As proposed, the park would include approximately 23 square kilometers (5,800 acres) of land located just north of the intersection of U.S. 95 and State Route 265 at Blair Junction. As currently envisioned, the proposed park would include hiking areas and interpretive trails with displays about the unique geologic formations in the area. The Nevada State Legislature in June 2007 provided for establishment of the State Park, which would be on land currently administered by the BLM. To transfer the land to the State of Nevada for establishment of the State Park, the BLM would conduct an environmental assessment and other work required as part of the Recreation and Public Purpose Lease process.

5.3.1.3.6 Other Regional Economic Development

Cumulative impacts issues associated with regional economic development actions include socioeconomic effects and overall growth in the region of influence. South and east of the Carson City/Reno area, several regional economic development initiatives are on-going or planned in the northern portion of the Mina rail alignment cumulative impacts region of influence. For example, a county-owned airport near the community of Silver Springs, Nevada, plans to expands its operations, pave its runway, and promote the development of nearby industrial parks totaling approximately 3.8 square kilometers (950 acres). Western Nevada Rail Park is approximately 56 kilometers (35 miles) east of Reno along Alternate U.S. Highway 50. When complete, the rail park would include roughly 1 square kilometer (240 acres) of industrial park serviced by the Union Pacific Railroad mainline. A master-planned community is being developed near the community of Dayton, Nevada. The development contains approximately 12 square kilometers (2,900 acres) consisting of approximately 2,300 single family homes, 0.02 square kilometer (4 acres) of multi-family units, 0.11 square kilometer (27 acres) of commercial land, 1 square kilometer (240 acres) of industrial land, and 0.08 square kilometer (20 acres) for a resort/casino and an improved airstrip that is approximately 1,600 meters (5,400 feet) long. Infrastructure, including new elementary, middle and high schools, fire station, municipal water and wastewater utilities, community center and a health and fitness center, is already in place to support this development. Industrial parks in the Hazen area are also being developed, including a 9.3-square-kilometer (2,300-acre) development along the existing Union Pacific Railroad mainline. As the Reno and Carson City metropolitan areas continue to grow and expand, additional privately sponsored developments can be expected within the northern portion of the Mina rail alignment cumulative impacts region of influence.

Additionally, major transportation corridors such as U.S. Highway 95 through the region of influence into both the Reno and Las Vegas areas will continue to grow and expand, and present additional regional economic development opportunities. A perceived need for support to the Nevada Test Site has led to designation of the Nevada Science and Technology Corridor by the Economic Development Authority for Nye County. The Science and Technology Corridor extends from Indian Springs in Clark County in the south to Tonopah in the north, passing through the Pahrump Valley, Mercury (an entrance to the Nevada Test Site), Amargosa Valley, Beatty and Goldfield, with industrial park and technology initiatives associated with the Tonopah Aeronautics and Technology Park, the Nevada Science and Technology Park in Amargosa Valley, and the Pahrump Center for Technology Training and Development. The locations and nature of specific future development opportunities are not known and are not considered to be reasonably foreseeable for the purposes of this analysis.

Nye County has completed a Yucca Mountain Project Gateway Area Concept Plan with proposed activities for the area around the entrance to the proposed repository site (DIRS 182345-Giampaoli 2007, all). This plan presents Nye County's conceptual, multi-phased land-use guidance for communities adjacent to and near the site entrance area. Nye County proposed this plan with the objective that land development occurs in an orderly and consistent manner and to increase opportunities for industrial and commercial development beneficial to the repository program. Nye County views this plan as a starting point for development of the infrastructure, institutional capacity, and facilities to support the proposed repository. The county developed the plan to use and manage existing initiatives while expanding and improving the area.

5.3.2 POTENTIAL CUMULATIVE IMPACTS – MINA RAIL ALIGNMENT

Located primarily in portions of Esmeralda, Nye, Lyon, and Mineral Counties, the Mina rail alignment cumulative impacts region of influence covers millions of acres of land, most of which is federally managed public land. Most of the land in the Mina rail alignment cumulative impacts region of influence is undeveloped, although much of it has been affected by human activity such as ranching and mining.

Potential cumulative impacts are often discussed herein within the context of the existing regulatory framework (primarily federal and state laws and regulations) and the BLM resource management planning goals and objectives. For example, the existing regulatory frameworks for water and air consider a regional and cumulative impacts perspective, in that regulatory decisions consider the potential effects from other projects as well as a proposed action. As the primary regional land manager, BLM planning and management actions consider the cumulative effects for many resources through stated planning goals and objectives, which often are based on quantitative criteria.

The following analysis of the cumulative impacts associated with the Mina rail alignment is organized by resource area, with Sections 5.3.2.1 through 5.3.2.15 summarizing potential cumulative impacts in the same order of resource discussions in Chapters 3 and 4 of this Rail Alignment EIS.

5.3.2.1 Physical Setting

5.3.2.1.1 Disturbance of Physical Resources

Physical resources consist of resources, conditions, and characteristics such as physiography, soils, and geology. As construction of any project in the area occurs, there would be a potential for changes to the physical setting because land would be disturbed through activities such as cuts and fills and construction of new structures such as buildings and bridges. The proposed railroad would be one of many new sources of change to physical resources that would continue the trend of increasing land disturbance and modifications of the natural physical environment. In large-scale projects that involve substantial ground disturbance, natural features are considered in project design, construction, operations, and potential abandonment plans, which would tend to limit direct, indirect, and cumulative impacts. The proposed railroad would disturb only a small percentage of land in the Mina rail alignment cumulative impacts region of influence.

Given the large amount of land potentially available for development of existing and reasonably foreseeable projects, and the small percentage of potentially available land required for the proposed railroad, overall cumulative impacts to physical setting in the Mina rail alignment region of influence would be small.

5.3.2.1.2 Known or Potentially Contaminated Soils

The major sources of existing soil contamination problems in the Mina rail alignment region of influence are mining, the Nevada Test Site, and the Hawthorne Army Depot. Mining activities in the region have occurred for many years, with mining wastes still remaining from older operations before the regulatory framework required waste management and cleanup. The problems associated with the Nevada Test Site have been described in recent NEPA documentation (DIRS 101811-DOE 1996, all; DIRS 162638-DOE 2002, all). Historic contamination of soils resources on the Nevada Test Site is primarily from radioactive-waste management sites and past nuclear testing activities. Environmental restoration and remediation is occurring at contaminated Nevada Test Site locations in accordance with the facility's Environmental Restoration Program, but much of the contamination is long-term and the land and soil are not restorable to useful condition. For most of the contaminated soils within the Nevada Test Site boundary, DOE is planning only a characterization and long-term monitoring program. Contaminated areas on the Nevada Test Site are generally defined and access is restricted for reasons of safety and security. Spills of any hazardous materials are possible with regional activities, but the current regulatory framework to manage and control hazardous materials and wastes ensures that actions are in place to minimize any impacts.

The Hawthorne Army Depot has an Installation Restoration Program that outlines proposed future investigations and remedial actions at each Solid Waste Management Unit at the installation and other areas of concern. A total of 123 Defense Site Environmental Tracking System sites have been identified on Hawthorne Army Depot property. Soil and groundwater contamination issues exist with the primary contaminants of concern being compounds associated with explosives and heavy metals. Environmental restoration and remediation is ongoing at a number of sites. Other sites have achieved the status of "no further remedial action planned." Contaminated areas on the Hawthorne Army Depot are generally defined and access is restricted for reasons of safety and security.

Contaminated soils or spills can affect other resources such as water resources, biological resources, and land use. Spills of any hazardous materials are possible with regional activities, but the current regulatory framework to manage and control hazardous materials and wastes ensures that actions are in place to minimize any impacts. While any potential impacts associated with hazardous materials and wastes from current and future mining operations in the region are controlled through the existing regulatory framework, mining wastes from old mining extraction and processing activities, especially in the Goldfield area, remain a concern related to soil contamination.

The proposed railroad could result in very localized contamination of soils through occasional spills (such as fuel, oil, and solvents). However, such incidents would be minor in scope and quickly mitigated in accordance with plans and regulations. All existing and foreseeable projects would be subject to the same regulations. Cumulative impacts related to contamination of soils would likely be small.

5.3.2.2 Land Use and Ownership

5.3.2.2.1 Land Use Changes

Many of the past, present, and reasonably foreseeable future actions in the Mina rail alignment region of influence result in land use changes. Land use change can also alter land ownership, land management responsibilities, and preclude future activities from these areas. The vast majority of the land used for the proposed Mina rail alignment and associated facilities would be on BLM-administered land in Lyon, Mineral, Esmeralda, and Nye Counties. The BLM manages more than 45,000 square kilometers (11 million acres) in those four counties. One of the primary land uses in and around the proposed Mina rail alignment on those BLM-administered lands is grazing. Regional grazing activities are often affected by BLM land management plans and activities.

Other existing and reasonably foreseeable major land uses in the Mina rail alignment region of influence include:

- Yucca Mountain Repository – About 6.3 square kilometers (1,600 acres) of land disturbance, most of which would be on the Nevada Test Site (already withdrawn for Nevada Test Site activities).
- Nevada Test and Training Range – About 12,000 square kilometers (3 million acres) of land the U.S. Air Force has withdrawn for special-purpose use, with about 530 square kilometers (130,000 acres) of that land disturbed by Air Force tactical target complexes and associated infrastructure.
- Nevada Test Site – About 3,200 square kilometers (800,000 acres) of land DOE has withdrawn for special-purpose use.
- Naval Air Station Fallon and the Fallon Range Training Complex – Naval Air Station Fallon administers approximately 30 square kilometers (8,000 acres) of withdrawn and acquired land associated with the air station and 950 square kilometers (234,000 acres) of land associated with the Fallon Range Training Complex.
- Walker River Paiute Reservation – Approximately 1,300 square kilometers (323,000 acres) of land managed by the Walker River Paiute Tribal Council.
- Hawthorne Army Depot – Approximately 600 square kilometers (147,000 acres) of land managed by the Army for purposes of receiving, issuing, storing, renovating, inspecting, demilitarizing, and disposing of conventional ammunition. The Army is in the preliminary planning stages regarding an offer from a private firm of 40 square kilometers (10,000 acres) to expand the Army's military training and other missions.
- Reno and Carson City Expansion – A minimum of approximately 25 square kilometers (6,300 acres) of industrial, commercial, and residential developments associated with growth and expansion of the Reno and Carson City Metropolitan areas into the northern portion of the Mina rail alignment cumulative impacts region of influence.
- Hazen industrial parks – Two industrial parks are being developed at Hazen. The Great Basin Industrial Park, a 9.3-square-kilometer (2,300-acre) industrial and residential project is being developed alongside the existing Union Pacific Railroad mainline. Churchill County has already approved this project. The Rail Park, the Union Pacific Railroad mainline from the Great Basin Industrial Park, spans approximately 1.9 square kilometers (480 acres) and is currently in the planning stage.

- Right-of-way corridors that might be established when the DOE West-Wide Energy Corridor programmatic EIS (70 *FR* 56647, September 28, 2005) is completed.

The proposed Mina rail alignment would disturb up to 140 square kilometers (35,000 acres) of land, most of which would be within the construction right-of-way. Therefore, the proposed Mina rail alignment would directly affect about 0.25 percent of the BLM-administered land in the four counties. This disturbance would include construction and operation of the rail line, facilities, quarries, water wells, construction camps, and access roads. The Mina rail alignment would cross up to 15 separate grazing allotments. These 15 grazing allotments constitute about 11,700 square kilometers (2.9 million acres) of BLM-administered land. The approximate disturbance area associated with the proposed Mina rail alignment would constitute less than 1 percent of the land within those 15 grazing allotments. Within this regional perspective of nearby existing and reasonably foreseeable land uses and land ownership, the commitment of land for the proposed Mina rail alignment and associated facilities would constitute a small proportion of overall cumulative land commitment. Use of private land for the proposed rail line would be small, and the rail line would not displace existing or planned land uses on private lands over a substantial area, nor would it substantially conflict with applicable land use plans or goals.

Considering both the proposed railroad and existing and reasonably foreseeable land uses and land ownership, cumulative impacts from land-use changes would be small.

5.3.2.2.2 Existing or Potential Land-Use Conflicts

The Federal Government administers most of the land in the Mina rail alignment region of influence, with the BLM, DOE, and the Department of Defense (Air Force and Army) acting as the major federal land managers. The Mina rail alignment region of influence also includes Walker River Paiute Reservation lands. Private land holdings are small, and generally associated with Chemetall Foote Corporation's Lithium mine near Silver Peak and other towns in the Mina rail alignment region of influence. Traditional land uses in most of the Mina rail alignment region of influence that would be directly and indirectly affected include grazing, mining, and wildlife management. Much of this land is not extensively disturbed, although it has been modified through activity such as grazing and mining.

Over time, human activity in the area, while relatively minor on a regional basis, has begun to change the natural and traditional conditions, and land-use conflicts occasionally result from this human activity. The Nevada Test Site and Nevada Test and Training Range lands have been withdrawn for special purpose and use. Both of these areas are inaccessible to the general public and land use is that of "dominant use," in which the specific DOE and U.S. Air Force missions, respectively, for these lands have ultimate priority over all other potential land uses. Hawthorne Army Depot and Naval Air Station Fallon lands were also withdrawn for special use, are inaccessible to the general public, and land use is that of "dominant use" in which the specific Army and Navy missions, respectively, for these lands have ultimate priority over all other potential land uses. Walker River Paiute Reservation lands are managed by a sovereign tribal government and used by reservation inhabitants accordingly. Around these primary regional land uses are other uses, including mineral development, recreation, urban development, and rights-of-way for various infrastructure. All of these activities and land uses result from a much more intensive land usage involving human activity.

Railroad construction and operation along the Mina rail alignment could have direct and indirect conflicts with grazing uses, access to grazing infrastructure, access to mineral resources, recreational resources, other linear rights-of-way (for example, utility corridors), and wildlife movement patterns in some locations.

Even with the existing and reasonably foreseeable land-use changes, the region as a whole would continue its traditional ways, with grazing and wildlife habitat as major land uses, and cumulative impacts related to land-use conflicts would be small.

5.3.2.2.3 Energy and Mineral Development

Existing and potential future energy and mineral development occurs in various locations throughout the Mina rail alignment cumulative impacts region of influence. In addition to the traditional energy and mineral development (primarily hard-rock mining and industrial mineral development), more recently this development includes geothermal and wind resources. The BLM administers energy and mineral development, evaluates and approves various proposed mineral development operations, and evaluates and approves geothermal energy development projects on federal lands proposed by private companies. Today's energy development environment includes a mix of old and new, involving both nonrenewable and renewable energy resource development.

Because of the scope and extent of typical mining operations, mineral resources that become actual operating mines could result in environmental and land-use issues. Within the Mina rail alignment region of influence, most mining and energy-development activities would occur on federal lands, and the BLM will have a major role in mitigating and monitoring potential effects through its mining and reclamation requirements, NEPA, and other elements of the regulatory framework. Mineral exploration will continue to occur in many parts of the Mina rail alignment region of influence, and some level of conflict from mining exploration and development with other land uses could be unavoidable.

Any potential conflict of the proposed railroad with energy and mineral development would be small in scope and occur in localized areas, and the effects of any such conflicts would be mitigated through the existing regulatory framework and BLM policies and plans. All existing and foreseeable projects would be subject to regulatory requirements and BLM policies and plans related to energy and mineral development. Therefore, cumulative impacts resulting in land-use conflicts related to energy and mineral development along the Mina rail alignment would be small.

5.3.2.2.4 BLM Land Sales and Other Disposals

While specific initiatives for land disposals in the Mina rail alignment region of influence have not yet been developed, BLM has plans to designate for potential future disposal approximately 750 square kilometers (185,000 acres) of public lands in the area including: lands that are difficult and uneconomic to manage (for example, scattered parcels south of Hawthorne and in Smith and Mason Valleys, checkerboard lands near Fernley, Silver Springs and the Carson sink); land that would support community expansion (such as land west of Yerington, land surrounding the towns of Luning, Mina, Sodaville, Fallon, Gabbs, Reno, Verdi, and lands east of Montgomery Pass, near Honey Lake Valley and Dixie Valley); lands with possible agricultural potential (for example, Smith Valley, Mason Valley, Honey Lake Valley, and Edwards Creek); lands along the East Walker River identified for exchange to benefit Bureau programs.

Approximately 92 square kilometers (22,622 acres) have been identified for potential disposal in the vicinity of Goldfield, about 23 square kilometers (5,765 acres) have been identified for potential disposal near Scottys Junction, and 160 square kilometers (39,432 acres) have been identified for potential disposal near Beatty. Land disposal areas have also been identified near Coaldale Junction, Blair Junction, Silver Peak, and Millers.

While the proposed railroad would operate within the regional context of BLM land disposal efforts and any related implications and effects, the railroad would have no affect on, nor would it be affected by, BLM land disposal efforts.

5.3.2.2.5 Recreational Land Use

Public lands in the Mina rail alignment region of influence provide a number of diverse recreation opportunities, and the BLM has designated certain lands as recreation management areas. Demand for recreation is increasing as more people move to and recreate in the Mina rail alignment cumulative impacts region of influence. Dispersed recreation, the principal opportunities available within the Mina rail alignment region of influence, requires a variety of sites but needs no special facilities. These opportunities include caving, photography, automobile touring, backpacking, bird watching, fishing, hunting, primitive camping, hiking, rock climbing, and competitive and noncompetitive off-highway vehicle events. An example of increasing interest in recreation areas is the proposal for the Monte Cristo's Castle as a State Park near Blair Junction; this Park would highlight the unique geology of the area and include hiking areas and interpretive trails with displays about the geologic formations in the area.

The BLM has a major role in recreation opportunities in the Mina rail alignment region of influence. BLM field offices regularly evaluate new opportunities for recreational resources that would provide both passively and actively managed recreation opportunities. There are many such areas that BLM has designated for recreational use, such as a campground and other day-use facilities at Walker Lake, attracting about 35,000 visitors per year. Other forms of dispersed recreation in the region of influence include hunting, camping, and off-highway vehicle use. Increased demand for off-highway vehicle use from the increasing regional population, including the Las Vegas and Reno-Carson City areas, is expected to continue. Many areas of BLM-administered land in Clark County previously used for off-highway vehicle recreation have been closed, causing a shift in use into other BLM areas. As growth and development occur in the Mina rail alignment cumulative impacts region of influence, recreational resources will continue to be in demand, but the potential for conflict with recreational resources also will increase. Recreational resource locations, quality, and availability will evolve as the Mina rail alignment region of influence changes.

The Pahrump area is growing very rapidly for a variety of reasons. Both developed and undeveloped recreational opportunities in the area are abundant, with very easy access to public lands for activities such as hiking, camping, sightseeing, and rockhounding. The town of Pahrump is planning for development of approximately 6 square kilometers (1,500 acres) to be called the Last Chance Park on lands currently managed by the BLM and already used for various types of recreation. The plans include construction of access roads, restrooms, parking areas, and turn-outs, as well as the placing of signs, bike racks, benches, a pole-and-cable fence, trash cans and picnic tables. Much of the park would be dedicated to equestrian, hiking and biking paths, with the remainder allotted to all-terrain vehicle motorized use. Potential environmental impacts and issues will be identified and assessed through the NEPA process.

DOE has sited the proposed Mina rail alignment to avoid wilderness areas and other major recreational resources to the maximum extent practicable. Given the limited effects on regional population, the existence of vast regional recreational opportunities, and limited direct interaction of the railroad with recreational resources, cumulative impacts to access to and use of recreational resources in the Mina rail alignment region of influence would be small.

5.3.2.2.6 BLM Rights-of-Way

As urbanization and other development occur in the Mina rail alignment region of influence, the need for utility and other rights-of-way will increase. The BLM has developed certain preferred corridors over federal lands that it uses to the maximum extent possible for linear rights-of-way, such as for utilities. This keeps many right-of-way purposes together in one location instead of spreading them out over more dispersed areas.

The land-use changes authorized by a BLM right-of-way grant would also have the potential to impact other resource areas as those land-use changes occur. Before approval of right-of-way applications, the BLM will evaluate the impacts of the projects through appropriate NEPA evaluation. Use of land for right-of-way purposes is consistent with BLM regulations and planning processes, and any land-use changes or disturbances associated with those rights-of-way are mitigated to the extent possible and according to BLM policies. As required for the issuance of rights-of-way, the project proponent would prepare and submit to the BLM a Plan of Development for each proposed right-of-way. The Plan of Development would describe the methods and procedures to be used to construct the proposed action on the right-of-way, including site-specific stipulations, terms, and conditions to satisfy all BLM requirements. Certain rights-of-way are long-term in nature and result in unavoidable impacts through land disturbance and the exclusion of other land uses now or in the future.

Utility and other right-of-way crossings are common to linear projects such as roads, railroads, and pipelines. Land areas for the Mina rail alignment, construction camps, quarries, and access roads would cross or overlap existing or proposed utility rights-of-way in approximately 22 to 29 locations. Land areas for railroad operations support facilities could also overlap existing or proposed utility rights-of-way. This situation would be typical for other linear rights-of-way. The crossings would be accomplished with small impact using standard engineering procedures and appropriate design details.

Cumulative impacts to BLM rights-of-way and right-of-way holders would be small.

5.3.2.2.7 Other BLM Land-Management Actions

The Federal Land Policy Management Act of 1976 (Public Law 94-579) mandates the BLM to manage its public lands from a multiple-use perspective. The Federal Land Policy Management Act specifically mentions balancing renewable and nonrenewable resources, including but not limited to recreation, range, timber, minerals, watershed, wildlife, fish, natural, scenic, scientific, and historic values. Therefore, the BLM mission to manage the lands to meet multiple-use objectives is challenging, because many of the resources and associated values often conflict.

Within the context of the Mina rail alignment cumulative impacts region of influence, the BLM planning process and management goals and objectives within their plans are key determinants of the compatibility of the proposed railroad with other projects in the region of influence. As noted in Section 5.3.1, there are many continuing and reasonably foreseeable activities that involve the BLM. Because the BLM is and will remain the major land manager in and around the Mina rail alignment region of influence, BLM land-management goals, objectives, and subsequent land-management actions will largely determine if and how new projects and activities occur.

BLM objectives and goals within the resource management plans can serve to encourage or restrict activities in certain locations. Areas needing special management attention (such as Areas of Critical Environmental Concern) are also identified in the planning process to protect and prevent irreparable damage to important historical, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. Multiple-use management goals and objectives become more challenging as cumulative development and land-use changes encroach on open land in the Mina rail alignment region of influence.

The Mina rail alignment would cross three BLM planning areas (Carson City, Battle Mountain, and Las Vegas). Each BLM Field Office manages lands within its administrative boundaries according to one or more Management Framework Plans or Resource Management Plans. The Carson City, Battle Mountain, and Las Vegas plans would be applicable to the Mina rail alignment. These programs and resource management plans require a number of public and private partnerships and a collaborative approach to land management and planning.

Grazing operations are a major BLM land-management program in the Mina rail alignment region of influence. Grazing results in both direct and indirect cumulative impacts to vegetation, habitats, and wildlife. Environmental impacts associated with grazing operations are a function of the location, timing, intensity, duration, and frequency of grazing. Grazing animals directly affect plant communities through trampling and nutrient redistribution. The most noticeable impacts occur around waters, salt blocks, fence lines, and other areas where animals concentrate. With proper grazing management, these concentration areas are limited in extent and mitigated regularly through management procedures such as movement of salt blocks and water hauls. While grazing can stimulate growth of some plants and provide other benefits, it can also reduce plant abundance, density, and vigor, especially in sandy soils.

Ultimately, BLM land-management efforts and the content of resource management plans will play a major role in the magnitude, location, and extent of direct, indirect, and cumulative impacts in the Mina rail alignment region of influence, and in the relative balance among multiple uses and resource values chosen for the public lands. DOE recognizes the importance of these land-management actions and encourages readers to review specific resource management plans for more detailed information. As discussed in Chapter 2 of this Rail Alignment EIS, the proposed railroad would be subject to BLM decisions and approval, and any effects of the railroad on BLM resource management planning, land-management activities, and BLM-managed natural resources would be implemented by BLM as appropriate. The proposed railroad's contribution to cumulative impacts to BLM land-management planning and actions in the Mina rail alignment region of influence would be small.

5.3.2.2.8 Urbanization and Economic Development Initiatives

In response to increased economic development goals in the region of influence, the urbanized areas in the Mina rail alignment region of influence have generally planned for and solicited ways to grow and develop. Concepts such as industrial-park development, airport expansion, increased retail opportunities, and housing are prominent goals of the public and private sectors in the Mina rail alignment region of influence. Several regional economic development initiatives are on-going or planned in the northern portion of the Mina rail alignment cumulative impacts region of influence. This trend is likely to continue, with land-use and ownership changes and potential land-use conflicts becoming an increasing issue and challenge for the future. However, it is likely that the rural nature of the overall Mina rail alignment cumulative impacts region of influence will remain largely in tact.

With or without the proposed railroad, urbanization and economic development activities, while increasing, would not generally change the overall undeveloped character of the Mina rail alignment region of influence.

5.3.2.3 Aesthetic Resources

Cumulative impacts to aesthetic resources from construction and operation of a railroad along the Mina rail alignment and other regional activities would primarily result from modifications to natural viewsheds. The natural setting of the Mina rail alignment region of influence includes vast and expansive viewsheds typical of much of the western United States. The open spaces and wide vistas offer interesting cloud, weather, and landscape interactions. Human activity disturbs the natural viewsheds with views of land disturbances such as buildings, roads, removal of vegetation, power lines, equipment, and vehicles. Any activity that disturbs substantial areas of land can result in visual impacts from fugitive dust and ground scars that create a contrast with the surrounding environment and draw the viewer's attention. Additionally, most man-made structures are designed and built for their functionality and safety, not for their visual appeal or compatibility with the visual character of the landscape. For example, projects with construction-related equipment, facilities, and activities can include the presence of workers, camps, vehicles, and machinery, lay-down yards, and dust. The likely addition of explosives bunkers at the Hawthorne Army Depot and projected wind-energy development are examples of other long-term visual changes that are reasonably foreseeable. Each type of project has its unique visual features, but generally, new projects would not be consolidated into any specific location within the region of influence.

While the area has a history of railroad use, the presence of a railroad and associated train traffic would be an identifiable change to the regional viewsheds from some observation points and provide a noticeable contrast with natural visual attributes. The passage of a train would attract the attention of an observer, both because of the noise associated with the train and the contrast with the landscape, especially if the train were to fall in the foreground or middle ground of the viewshed. Visual impacts of passing trains would be temporary, but visual impacts of the track would be long term.

Visual resources within the region of influence have been considered through application of the BLM Visual Resource Management System (see Sections 3.3.3 and 4.3.3 and Appendix D of this Rail Alignment EIS). This system identifies and classifies the BLM-administered lands within established visual resource objectives, and proposed activities are evaluated within the visual resource management framework to consider consistency with the visual resource objectives. Without restoration and reclamation efforts, ground disturbances in the regional environment would last for long periods. The magnitude and extent of potential visual impacts vary based on the number of viewers affected, distance and atmospheric conditions of viewing, degree of visual contrast compared to existing visual attributes, viewer sensitivity to the visual changes, and compatibility with existing land uses. The BLM generally requires ground disturbances to be restored and reclaimed as part of project approval.

For the Mina alignment, analysis using the Visual Resource Management System indicated that the proposed railroad would potentially be inconsistent with visual resource management objectives in the areas of the Schurz crossing of U.S. Highway 95 (construction), and some cuts and fills (during construction and operations). As shown in Appendix D, lands that have potentially restrictive visual resource objectives (such Classes I and II) are not prevalent in the region of influence.

There would be no known interactions of the proposed railroad with other reasonably foreseeable activities that would affect a Class I or Class II area in the Mina rail alignment region of influence.

5.3.2.4 Air Quality and Climate

Emissions of concern in the Mina rail alignment region of influence include fugitive dust and emissions resulting from the operation of machinery and equipment. Construction activities such as surface disturbance and use of haul trucks in the Caliente rail alignment region of influence would generate fugitive dust. Fugitive dust is a type of nonpoint source air pollution (small airborne particles that do not originate from a specific point). These particulate matter emissions are regulated according to their size (aerodynamic diameter equal to or less than 2.5 micrometers [$PM_{2.5}$] and 10 micrometers or less [PM_{10}]). Fugitive dust is generally controlled through the application of water, or in some cases, application of a chemical compound designed to minimize dust emissions. Most of the projects and activities identified in this analysis would generate some level of fugitive dust. The plumes associated with fugitive dust generation are often localized to the area being disturbed and are temporary. In arid areas such as the Mina rail alignment cumulative impacts region of influence, generation and control of fugitive dust will always be a concern. Exhaust emissions from the operation of machinery and equipment include sulfur dioxide, oxides of nitrogen, volatile organic compounds, and carbon monoxide.

There is a comprehensive air quality permitting system in Nevada to evaluate and approve only those projects that are allowable within quantitative air quality thresholds. The Nevada Division of Environmental Control, Bureau of Air Pollution Control, has established and implemented air pollution control requirements in Nevada Revised Statutes 445B.100 through 445B.825, inclusive, and Nevada Revised Statutes 486A.010 through 486A.180, inclusive. The Bureau of Air Pollution Control has jurisdiction over air quality programs in all counties in the state except Washoe and Clark. The Bureau of Air Pollution Control also has jurisdiction over all fossil fuel-fired units in the state that generate steam for electrical production. The Mina rail alignment would be subject to the permitting requirements noted above, and would occur in air basins that are either in attainment or unclassifiable. The State of Nevada will not grant permits for activities that cannot show compliance with the applicable federal and state regulations.

The air quality impact analysis for the Mina rail alignment assessed potential impacts through several means, including air quality modeling of maximum concentrations relevant to National Ambient Air Quality Standards. The analysis concluded the emissions during construction or operation of the rail line or any associated facilities would be in conformance with applicable standards, with the exception of the 24-hour standard for both PM_{10} and $PM_{2.5}$ near the construction right-of-way at Mina and Schurz during the relatively short construction period, and at the Staging Yard at Hawthorne and the potential Garfield Hills quarry. DOE would be required to prepare an application for a Dust Control Permit and a Surface Area Disturbance Permit Dust Control Plan and submit them to the Nevada Division of Environmental Protection Bureau of Air Pollution Control prior to the quarry and Staging Yard development. It is likely that the requirements of the plan would reduce fugitive dust emissions, thus reducing the possibility of exceeding National Ambient Air Quality Standards.

Potential cumulative impacts to air quality from construction and operation of the proposed railroad along the Mina rail alignment would be small, but could approach moderate if the potential violation of the National Ambient Air Quality Standards noted above occurred.

5.3.2.5 Surface-Water Resources

5.3.2.5.1 Changes in Drainage, Infiltration Rates, and Flood Control

Construction of major projects in previously undeveloped areas often results in changes to natural drainage. Construction could include regrading that would allow runoff from a number of minor drainage channels to collect in a single culvert or pass under a single bridge, which would result in water flowing from a single location on the downstream side rather than across a broader area. This would cause some localized changes in drainage patterns, but this probably would occur only in areas where natural drainage channels are small. Compaction of soil during construction could reduce water infiltration rates and change natural runoff and drainage patterns. However, some activities would disturb and loosen the ground for some time, which could cause higher infiltration rates.

Construction in washes or other flood-prone areas probably would reduce the area through which floodwaters naturally flow. This could result in water building up, or ponding, on the upstream side of crossings during flood events, and then slowly draining through the culverts or bridges. These alterations to natural drainage, sedimentation, and erosion would be unlikely to increase future flood damage, increase the impact of floods on human health and safety, or cause significant harm to the natural and beneficial values of the floodplains.

Insufficient inflow from the Walker River into Walker Lake would continue to jeopardize Walker Lake's future as a viable fishery, with or without the proposed railroad. If developed, the proposed railroad would not result in further inflow reductions into Walker Lake. Mitigation measures that could be implemented by the U.S. Fish and Wildlife Service or other entities could improve the chances for a viable fishery in the lake in future years.

As a long linear project of up to 502 kilometers (312 miles) long, the proposed Mina rail alignment would pose new surface drainage challenges because of the existing characteristics of terrain, topography, soils, and physical features. Construction activities that could temporarily block surface drainage channels include moving large amounts of soil and rock to develop the rail roadbed (subgrade) and constructing temporary access roads to reach construction initiation points and major structures, such as bridges, and to allow movement of equipment to the construction initiation points.

Project planning and best management practices would help avoid or reduce potential impacts from the proposed railroad or other ongoing or reasonably foreseeable future actions. Potential cumulative impacts due to changes in drainage, infiltration rates, and flood control would be very small and localized.

5.3.2.5.2 Spill and Contamination Potential

Major construction activities and other projects in the region of influence would use materials including petroleum products (fuels and lubricants) and coolants (antifreeze) necessary to operate construction equipment, and could include solvents used in cleaning or degreasing actions. A release or spill of contaminants to a stream or river would have the greatest potential for adverse environmental impacts; a release of contaminants to dry impermeable soil would have the least potential for adverse impacts. Other projects would face similar situations. Spill-control and -management plans (and standard operating procedures for the construction industry) would reduce the likelihood of spills. Construction and operation of the proposed railroad would be typical of major activities that use materials that could cause contamination through spills.

While the risk of a spill and associated water contamination cannot be totally eliminated, risks can be managed through regulatory controls so that the resulting cumulative impacts would be small.

5.3.2.6 Groundwater Resources

Existing and proposed future development within the Mina alignment region of influence presents the challenge of matching water supply with water demand. Because water availability is a potential resource constraint in the Mina rail alignment region of influence over time, water demand can be both competitive among potential users and controversial among users and the general public. To allocate water uses, the State of Nevada uses a water permit application process coordinated by the State Engineer. Once granted, water rights in Nevada have the standing of both real and personal property. It is possible to buy or sell water rights and change the water's point of diversion, manner of use, and place of use by filing the appropriate application with the State Engineer. Overall, because the water permitting and allocation process considers the broad range of factors noted above, the process serves as a way to manage potential cumulative impacts of water demand and use within each basin.

Representative existing and reasonably foreseeable water uses in the Mina rail alignment region of influence include:

- Public-supply/municipal, agricultural (stock watering), and mining uses collectively comprise approximately 87 percent of groundwater use within the Mina rail alignment region of influence.
- The Nevada Test Site uses about 830,000 cubic meters (673 acre-feet) of water per year.
- The Yucca Mountain Repository demands would range from about 218,000 to 527,000 cubic meters (176 to 427 acre-feet) of water per year between calendar years 2010 and 2013, which represents the period of the highest water demand for the Mina rail alignment project. The Repository would use approximately 76,700 to 397,000 cubic meters (62 to 322 acre-feet) of water per year in calendar year 2014 through completion of operation.

It is estimated that rail construction along the Mina rail alignment would use up to about 7.34 million cubic meters (5,950 acre-feet) of water, with about 80 percent of that water use occurring in the first 2 years of construction. About 23,000 cubic meters (17 acre-feet) of water would be needed annually during the operations phase. DOE would obtain water for construction and operation of the railroad from proposed new wells installed in various water basins along the Mina rail alignment.

Committed groundwater resources in the Mina rail alignment region of influence already exceed annual perennial yield values (a measure of available groundwater supply replenished each year through recharge) within some of the groundwater basins (hydrographic areas) that would be affected by the proposed railroad. Based on the proposed locations of new wells in specific hydrographic areas along the proposed Mina rail alignment, additional groundwater appropriations would be needed in 19 hydrographic areas. However, committed (cumulative) groundwater resources currently exceed estimated perennial yields in eight of these hydrographic areas (146, 149, 170, 173A, 203, 204, 228, and 229). One of these eight hydrographic areas (229) and two other hydrographic areas (144 and 145) that the Mina rail alignment would cross have low perennial yields. Five of these areas are State of Nevada-designated groundwater basins. While designated groundwater basins are not considered closed to additional appropriations, the State Engineer could impose additional restrictions and preferred uses of the water in these designated basins.

A number of scenarios have been developed to assess the potential effects of the Mina rail alignment's contribution to cumulative water demand in the cumulative impacts region of influence. Groundwater would need to be appropriated in 18 hydrographic areas. The assumption used for developing these scenarios is that water demands for railroad construction and operations along the Mina rail alignment would be met through installing and withdrawing groundwater from new wells, with pumping in individual wells at a constant rate occurring primarily over 9 months to support all rail-line construction water needs, over 2 to 3 years at quarry sites, and over the railroad operations period for facilities. Depending on the specific combination of alternative segments, total water withdrawals associated with the proposed railroad could exceed annual perennial yield values for hydrographic areas 123, 144, and 229, and could be as high as 48 percent, 57 percent, 82 percent, 87 percent, and 99 percent of the annual perennial yield in hydrographic areas 145, 228, 110A, 121B, 227A, respectively. In other areas, water withdrawals associated with the railroad would range from less than 1 percent to as high as approximately 28 percent of the annual perennial yield value.

By utilizing a combination of one or more specific approaches or methods to obtain water for construction (including methods that are tailored to a hydrographic area's unique groundwater condition), potential cumulative impacts to groundwater resources would be minimized. New groundwater withdrawals could, depending on the withdrawal rate; hydrogeologic conditions present at the proposed pumping location and in the surrounding area; and the location and characteristics of nearby groundwater resource features, cause some decrease in the amount of water that might be available to an existing well having an associated water right, to an existing spring discharge, or to a downgradient groundwater basin.

Overall, the needs of the proposed railroad would represent a small portion of the current cumulative water usage within the Mina rail alignment region of influence, which in some locations would continue to exceed perennial yield values.

5.3.2.7 Biological Resources

5.3.2.7.1 Habitat Loss and Fragmentation

Past, present, and reasonably foreseeable future actions in the Mina rail alignment cumulative impacts region of influence would result in noticeable cumulative land disturbance. Existing activities such as the

Nevada Test and Training Range, the Nevada Test Site, Naval Air Station Fallon and the Hawthorne Army Depot have already resulted in land disturbance and substantial changes to existing biological resources, and projects such as the various proposed industrial parks and master-planned communities in the northern portion of the Mina rail alignment cumulative impacts region of influence would continue this trend. Such land disturbances result in altered natural biological and ecological conditions, and directly serve to reduce the amount of natural land available as habitat and open space.

The primary adverse construction-related impacts on vegetation communities from ground disturbance would be the physical destruction or removal of vegetation, and the permanent or temporary removal or compaction of topsoil or other growing medium for the plants. These effects would occur with any major activity resulting in ground disturbance, including the proposed railroad. As more activity occurred, the cumulative loss of vegetative communities and associated habitats would increase. Management of these effects would typically be considered in project planning and mitigation, including projects on BLM-administered land. Much of the emphasis in land management in the Mina rail alignment region of influence concerns the maintenance or reconstruction of healthy habitats.

Habitat destruction would lead to direct impacts such as wildlife injury and mortality, alteration of behavior and movement patterns, and the indirect impacts of reduced vegetative health, reduced biological diversity, and locally degraded ecological function. When extensive habitat fragmentation occurs, the individuals or populations of particular species could have difficulty surviving. Habitat destruction arises from a number of sources, including projects that involve land disturbance, and land management actions including wild horse and burro management. Though any project that causes disturbance of vegetation contributes to habitat fragmentation, linear projects that impose any degree of impediment to movements, like the proposed railroad, amplify the potential effects.

Measures to avoid, minimize or otherwise reduce impacts are typically implemented by project proponents and encouraged by government agencies and generally include actions to reduce or avoid habitat fragmentation and loss. Such actions would include minimizing land disturbance, using existing roads, interim reclamation, combined roads/utility rights-of-way for pipelines and cables, noise reduction, centralization of facilities, and employee training and education.

The Hawthorne Army Depot has an Integrated Natural Resources Management Plan (DIRS 181899-USAF 2007, all), which is being used to ensure that natural resource conservation and Army mission activities are integrated and are consistent with federal stewardship requirements on mission lands. The plan describes an ecosystem-management approach that provides guidance to avoid the impacts of habitat loss and fragmentation, conserve biodiversity, and improve and enhance natural resource integrity while supporting sustainable economies and communities.

In areas proposed for railroad operations purposes, the impacts to vegetation would typically be moderate in scope, and cumulatively add to habitat loss and fragmentation. However, in areas slated for short-term use during the construction phase, such as construction camps, revegetation and reclamation efforts would result in replacement of topsoil, reseeding of native species, monitoring for success, and eventual return of a native vegetation community to conditions comparable to predisturbance conditions.

Cumulative impacts due to habitat loss and fragmentation would be small to moderate through the construction and operations phases throughout the Mina rail alignment region of influence.

5.3.2.7.2 Invasive Species and Noxious Weeds

Invasive species and noxious weeds naturally move into new areas over time, but this occurrence has been accelerated in many areas through human activity, either intentionally or unintentionally. In many cases, these plants have been moved into North America from another continent. They have been accidentally introduced through contaminated grain or hay, or sometimes intentionally introduced for erosion control or as ornamentals. In addition, livestock and vehicles can cause invasive species and noxious weeds to spread, birds could carry seed, or the species can be brought in with contaminated fill dirt. Regardless of how they were introduced, invasive species and noxious weeds possess characteristics that allow them to compete aggressively with native vegetation. Invasive species and noxious weeds impact native plants, animals, and natural ecosystems by:

- Reducing biodiversity
- Altering hydrologic conditions
- Altering soil characteristics
- Altering fire intensity and frequency
- Interfering with natural succession
- Competing for pollinators
- Displacing rare plant species
- Replacing complex communities with single-species monocultures

From a cumulative impacts perspective, any time land is disturbed and native vegetation is lost there is an opportunity for noxious weeds to replace the native vegetation. While the BLM and other land owners/ managers in the area have implemented programs to minimize this potential, invasion of noxious weeds cannot always be prevented. Therefore, coordinated multi-agency management actions and efforts are needed to mitigate the effects from cumulative land disturbance. Management of noxious and invasive weeds is essential for restoration of native plant community health and resiliency. If noxious and invasive weeds were not managed, they would continue to gradually replace more desirable native species throughout the Mina rail alignment region of influence.

Linear disturbances such as pipelines, roads, utility corridors, or rail alignments that cross relatively undisturbed land have the potential to exacerbate the spread of these species into areas not previously affected. As the invasive or noxious weeds become established along the linear features they spread to adjacent areas, affecting the plant and animal communities beyond the actual disturbance, and are able to outcompete native species by responding more rapidly to the infrequent availability of water.

These impacts could occur as a result of railroad construction and operation and from existing or foreseeable projects, but strict adherence to best management practices should reduce the potential for impacts. Cumulative impacts due to the introduction and spread of invasive species and noxious weeds would be small.

5.3.2.7.3 Special-Status Species

Habitat for several special-status species would be disturbed, and individual mortality of several of those special status species could occur during railroad construction and operations along the Mina rail alignment. Through the NEPA and permitting processes, each proposed project and land-management planning effort in the Mina rail alignment region of influence will face challenges for the protection of various special-status species. There are a number of special-status species that could be affected by cumulative impacts in the Mina rail alignment region of influence. Recent attention has focused on several specific species, including the desert tortoise and Lahontan cutthroat trout, as discussed below.

The Mojave population of the desert tortoise (*Gopherus agassizii*) is listed as threatened under the Endangered Species Act of 1973 (16 U.S.C. 1531 to 1544). It is found within the proposed Mina rail alignment only in the southwestern-most 48 kilometers (30 miles), from the Beatty Wash area to Yucca Mountain (DIRS 101830-Bury et al. 1994, pp. 55 to 72). The desert tortoise is found in southern California, parts of southern Utah, and in the southern portions of Nevada, with the tortoises potentially affected by railroad construction and operation at the extreme northern extent of their range. While relative abundance of the tortoise is low in much of the Mina rail alignment region of influence, every action that could disturb soil or vegetation within the tortoise's range has potential cumulative impacts of loss or fragmentation of the species' habitat or the direct mortality of individual desert tortoises

The threatened Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) is stocked in Walker Lake and occurs upstream to Weber Reservoir. Weber Dam currently blocks movement further upstream, and prevents spawning by cutthroat trout. However, in the near future, a fish ladder might be developed at that dam to allow fish movement. Reestablishment of a self-sustaining population of Lahontan cutthroat trout in the Walker River system is a prerequisite for recovery of this species. With mitigation, the construction activities along the Mina rail alignment would have minimal effects on the trout, but the existing problem with Weber Dam blocking movement of the trout further upstream would remain.

The BLM resource management plans sometimes place restrictions on other activities (such as grazing, wild horse and burro abundance, off-road vehicle use, mineral activities) so that desert tortoise or other special status species habitat can be protected. However, off-road vehicle use, shooting, and collecting of individuals continue to affect tortoise populations. Habitat protection efforts for the desert tortoise are coordinated among a number of federal, state, and local governmental agencies, with the cumulative impact perspective a major factor in determining allowable impacts to the tortoise. Restoration plans and habitat conservation plans also affect the required mitigation measures, best management practices, and standard operating procedures for the protection of the desert tortoise or other special-status species.

Private landowners, corporations, state or local governments, or other non-federal landowners who wish to conduct activities on their land that might incidentally harm (or "take") wildlife listed as endangered or threatened must first obtain an incidental take permit from the U.S. Fish and Wildlife Service. To obtain a permit, the applicant must develop a Habitat Conservation Plan, designed to offset any harmful effects the proposed activity might have on the species. Multi-species Habitat Conservation Plans are underway in two places in the Caliente rail alignment region of influence: (1) the Coyote Springs area and (2) in southern Lincoln County in the area of the recent BLM land disposal. Additionally, there is a single species (desert tortoise) Habitat Conservation Plan being developed in the Pahrump area of Nye County. These plans would support development of private lands while accounting for the potentially affected species.

No major effects on special status species are projected to result from construction and operation of the proposed railroad along the Mina rail alignment. DOE would conduct any required consultation with the U.S. Fish and Wildlife Service in accordance with the Endangered Species Act. There is a substantial regulatory framework, to which all projects are subject, that serves to evaluate and protect special status species. Therefore, cumulative impacts to special status species would be small.

5.3.2.7.4 Wildfires

Wildfires are a major environmental concern throughout the Mina rail alignment region of influence due to the generally dry climate and the increasing presence of invasive plant species. When they occur, wildfires have a significant and long-term impact on vegetation, wildlife, other natural resources, and human safety. The most important biological effects of fires include:

- Loss of native plant communities
- Decreased stability of watershed and soils
- Decreased or degraded wildlife habitat
- Increase in potential for invasive species spread
- Overall disruptions to ecological function

Sources of regional wildfires are both natural (for example, lightning) and human caused. With increased activity in the Mina rail alignment region of influence, the potential for future human-caused fires increases. Because the BLM administers most of the land in the Mina rail alignment region of influence, the BLM has primary fire-avoidance and fire-fighting responsibilities in the Mina rail alignment region of influence.

Both the proposed railroad project and other reasonably foreseeable future actions would likely implement appropriate fire-avoidance strategies in consultation with the BLM. Potential cumulative impacts from wildfires would be small.

5.3.2.8 Noise and Vibration

5.3.2.8.1 Railroad Noise

In the Mina rail alignment cumulative impacts region of influence, there is an existing branchline extending from Hazen, Nevada, to the Hawthorne Army Depot. The noise associated with railroad operations is part of the existing environment, specifically in the Schurz area where the railroad's presence is very evident. The sounds associated with the existing branchline include wayside noise (noise generated by the cars and locomotives), and horn sounding. The individual operating rules of each railroad require train engineers to sound horns when approaching most grade crossings. Horn sounding is generally not required at private crossings. Wayside noise and horn sounding are common in Schurz and along other portions of the existing branchline.

Hawthorne Army Depot is planning to construct a rail siding, known as the Wabuska Spur, which would increase the Depot's outloading capacity. Increased rail capacity could cause increases in overall rail traffic on the existing branchline and could result in more wayside noise and horn sounding events more frequently near Hawthorne within the Mina rail alignment cumulative impact region of influence.

Transportation of spent nuclear fuel and high-level radioactive waste casks would result in as many as eight one-way trips per week along the Mina rail alignment. Train activity associated with supply and maintenance of the Yucca Mountain Repository is also proposed along the completed railroad (as many as seven one-way trips per week), as is rail line maintenance activity (about two one-way trips per week), for a total of about 17 one-way trips per week. During the construction phase, completed portions of the rail line would also be used to deliver ballast to construction areas.

Potential impacts from noise along the Mina rail alignment would be expected to be small. However, the proposed railroad would introduce or expand noise sources into areas of the Mina rail alignment region of influence that previously had very limited railroad noise. This could result in incremental annoyance effects for some people.

While adverse noise effects could increase for some people in the Mina rail alignment region of influence, railroad construction and operations along the Mina rail alignment would substantially reduce noise impacts for people in Schurz, because the existing rail line through Schurz would be eliminated and replaced by one of Schurz alternative segments. This would provide a substantial reduction in annoyance effects for people in Schurz.

5.3.2.8.2 Urban Noise

Urban noise includes automobiles, construction activities, barking dogs, and other human activities generally within an identifiable community. At present, urban noise in the Mina rail alignment region of influence is limited because there are only a few cities and communities. However, with economic development and growth goals throughout the region of influence, the number and scope of urbanized areas is expected to increase. Urban noise is generally localized and is differentiated from the aircraft and railroad noise sources, which move with the source from one location to another, while urban noise is within identifiable geographic borders associated with the locations of populations.

The proposed railroad would have a very small effect on urbanization in the area, and its effect on urban noise in the Mina rail alignment region of influence would be small. Cumulative impacts related to urban noise would be small.

5.3.2.8.3 Aircraft Noise

Aircraft-related noise from engines and sonic booms is common throughout the Mina rail alignment cumulative impact region of influence, and can cause "startle" and annoyance effects. The noise associated with military aircraft is consistent with the "dominant use" of the area for military and defense-related activities at the Nevada Test and Training Range and Naval Air Station Fallon. Any noise effects associated with the missions for the Nevada Test and Training Range or Naval Air Station Fallow would be considered necessary and unavoidable. Commercial air traffic also contributes to noise impacts in the region of influence.

The proposed railroad would not contribute to cumulative aircraft noise.

5.3.2.8.4 Vibration

Vibration can be perceived on land surfaces and within buildings with certain types of activities. Construction activity is one of the more common sources of vibration, but construction vibration would be very localized and typically minor in scope and duration. In the Mina rail alignment cumulative impacts region of influence, other possible sources of vibration include occasional testing activities at the Nevada Test and Training Range and sonic booms from aircraft-related military activities in the airspace above the region of influence. These events would also tend to be short-term and localized.

Cumulative impacts from vibration would be small.

5.3.2.9 Socioeconomics

The economic roots of the Mina rail alignment cumulative impacts region of influence have traditionally been based on mineral development, military operations and support, and livestock grazing. These activities will continue to be the primary economic drivers in the Mina rail alignment cumulative impacts region of influence. Additionally, the expansion of the Reno-Carson City metropolitan area in the northern reaches of the Mina rail alignment cumulative impacts region of influence will continue to occur, providing additional economic inputs. While a railroad in the Mina rail alignment would be a major development in the region of influence, its long-term economic development potential would be limited and would primarily be related to construction activities. If the Shared-Use Option were chosen and implemented, there would be greater potential for positive economic development benefits compared to the Proposed Action.

Population growth in the Mina rail alignment cumulative impacts region of influence has generally been stagnant in much of the area. However, growth and development is desired by many in the region. It is uncertain if there is sufficient economic development growth potential in these areas to support the desired growth. It is possible that some areas would grow at the expense of other areas, or that recently developed plans for growth turn out to be unrealistic. Provision of housing to meet market demand is a private-sector activity, with the private housing sector assumed to build to the needed level to meet housing demand at the appropriate locations. One of the factors that will affect how and where growth occurs is the availability of infrastructure to support the growth. Beyond the traditional infrastructure needs like roads, sewer, water, and public buildings, modern infrastructure such as the availability of fiber-optic lines might also affect growth patterns. For example, the availability of fiber-optic lines or other high-technology infrastructure is likely to be a substantial growth discriminator for both businesses and individuals. The locations of and extent to which factors such as fiber-optic lines would ultimately affect growth cannot be predicted at this time.

The potential future BLM land disposals identified in Section 5.3.2.2.4, if implemented, could have the potential to provide land for private-sector projects such as housing, industrial or commercial facilities, or other developments. In contrast to specific developments proposed on BLM land disposals in the Caliente rail alignment region of influence, such growth in the Mina rail alignment region of influence is not currently planned and the market for this type of developmental stimulus is uncertain.

The State of Nevada has developed population projections for the Mina rail alignment cumulative impacts region of influence (DIRS 178807-Hardcastle 2006, all) as follows:

- Esmeralda County is projected to have a small decrease in population from 2005 to 2026.
- Nye County is projected to add mover than 32,000 persons from 2005 to 2026.
- Lyon County is projected to add more than 41,000 persons from 2005 to 2026.
- Mineral County is projected to have a small decrease in population from 2005 to 2026.

The Nevada State Demographer develops population projections for Nevada counties, which are always subject to change with new information.

Nye County's projected growth continues a recent trend, with growth in Pahrump very evident over the past several years. Growth in Pahrump is being driven by low-cost land, proximity to the Las Vegas metropolitan area, and relocation of retirees to the area. Growth in Nye County is also linked directly to existing and future Yucca Mountain Site operations. Growth in Lyon County is due largely to its proximity to Carson City and Reno.

As discussed in Section 4.3.9, Socioeconomics, DOE used an economic model to estimate potential socioeconomic impacts of the proposed railroad (DIRS 182251-REMI 2007, all). The model includes consideration of construction and operations employment and wages, project-related spending, and other parameters that could affect the socioeconomic environment. The model included a future baseline of socioeconomic parameters that would represent a cumulative impacts baseline without the proposed railroad.

Consistent with the methodology established in the Yucca Mountain FEIS (DIRS 155970-DOE 2002, p. 4-43), most of the construction workers for the proposed Mina rail alignment are assumed to be residents of Clark County. This assumption is made because the construction sectors in Nye, Esmeralda, Lyon and Mineral Counties are not large enough to provide sufficient workers for the construction activities. Under this scenario, Clark County is projected to attain the largest levels of construction-related employment, income, and spending effects from the proposed project, followed by Mineral, Nye, Esmeralda, and Lyon Counties. Mineral County would experience the largest employment percentage increase during construction with an estimated increase of about 6 percent above baseline conditions.

The socioeconomic analysis also considers a second scenario, which assumes that half of the construction workers for the Mina rail alignment reside in the combined Washoe County-Carson City area, and the other half reside in Clark County. This second scenario is considered because Washoe County and Carson City might be more likely than Clark County to supply construction workers for the northern portions of the Mina rail alignment. With this second scenario, the beneficial economic effects on Clark County would obviously be reduced, while the Washoe County-Carson City area would gain some of these beneficial aspects of proposed railroad project. In any case, the overall effects of the proposed railroad along the Mina rail alignment on the Clark County or Washoe County economies would still be relatively small.

Employee locations for the operations phase would follow the same general pattern and relative magnitude of the construction phase, but there would be fewer operations jobs than construction jobs. Gains in employment during the operations phase would be felt most strongly in Esmeralda County, where the peak percentage change in average annual employment is projected to be 6.3 percent above baseline conditions during full operations. Mineral County is the only other county in the region of influence projected to experience more than a 1 percent change in average annual employment at any point during the operations phase (2.6 percent).

Population changes that would result from construction and operation of the proposed Mina rail alignment are also projected to generally follow this pattern. During the construction phase, the upper bound of increase to population would be about 3 percent or less of the future cumulative population baseline in all four counties. The operations phase population change would have the largest percentage increase compared to the cumulative baseline in Esmeralda County (about 7-percent average annual increase over the baseline). There are no projected impacts to population on the Walker River Paiute Reservation.

Strains on housing infrastructure during the construction phase would not be anticipated because most construction workers could be housed in construction camps at strategic locations along the proposed Mina rail alignment, rather than in nearby communities. Contractors might elect to use commercially available facilities for housing construction personnel at locations such as Hawthorne, Tonopah, Goldfield, Beatty, and Pahrump. There would be enough vacant housing stock in these locations to absorb both construction and operations personnel.

Some infrastructure impacts would be expected where construction activities or operating facilities were near communities. For example, construction workers, including those from the proposed Mina rail alignment, could strain the existing health care service capacity in the Mina rail alignment region of influence, and particularly in Hawthorne, Goldfield, and Tonopah. The operations-related population gains could also result in identifiable effects on health and education-related services.

The road network in the Mina rail alignment region of influence consists generally of two-lane highways and unpaved roads. U.S. Highway 95 is the major north-south highway in the region of influence. In rural, less populated parts of the Mina rail alignment cumulative impacts region of influence, roads are adequate to handle existing and projected future traffic flow. However, the array of new and proposed activities throughout the Mina rail alignment region of influence would have the potential to strain parts of the existing roadway infrastructure.

Railroad project-related road traffic would result in small increases in some areas but railroad construction would not materially affect traffic volumes on local roads because most construction materials would be transported using rail, and most construction employees and contractors would be housed in construction camps linked to the work site by access roads. There could be some traffic delays at existing rail-highway grade crossings, and grade separation might be necessary for some crossings in Churchill, Lyon, and Mineral counties. However, cumulative traffic levels in the region would likely continue to increase as overall regional growth and development occurs.

Any road improvement and maintenance responsibilities in the region of influence are handled by the Nevada Department of Transportation through a Statewide Transportation Plan and a Statewide Transportation Improvement Program. The Statewide Transportation Improvement Program includes a 3-year list of federally funded and regionally important non-federally funded transportation projects and programs consistent with the goals and strategies of the Statewide Transportation Plan. Routine highway improvements and maintenance projects for the period 2006 through 2015 have been identified for Lyon, Mineral, Esmeralda, and Nye Counties as part of the Nevada Department of Transportation planning processes. The level of cumulative traffic changes would generally not be sufficient for major upgrades of regional roads.

Overall, the proposed railroad project would have a small impact on economic development and growth, housing and community infrastructure, and traffic in the Mina rail alignment region of influence. While there is some limited potential for induced growth impacts, the specific locations and scope of these actions is unknown at this time, and any such actions are projected to be small. Cumulative impacts to socioeconomics in the Mina rail alignment region of influence would be small.

5.3.2.10 Occupational and Public Health and Safety

5.3.2.10.1 Nonradiological Health and Safety

Throughout the Mina rail alignment region of influence, continuing and reasonably foreseeable activities have the potential to result in occupational injuries or fatalities including, but not necessarily limited to sources such as tripping, being cut on equipment or material, dropping heavy objects, and catching clothing in moving machine parts, and other types of accidents. Other occupational risks include biological hazards, dust and soils hazards, air quality hazards, transportation accidents, and noise hazards. Biological hazards include potential human health effects from rodent-borne diseases, soil-borne diseases, insect-borne diseases, and venomous animals. Dust and soils hazards include potential human health effects from exposure to inhalable soils and dusts containing hazardous constituents, and potential occupational encounters with unexploded ordnance.

While occupational injuries or fatalities are unavoidable with human activity, public and private facilities within the Mina rail alignment cumulative activity area are highly regulated. There is a substantial regulatory framework for occupational health and safety, with the Occupational Safety and Health Administration programs and regulations forming the basis for protection of workers. Through DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, the Department has prescribed the Occupational Safety and Health Act Standards that contractors are to meet in their work at government-owned, contractor-operated facilities. The Department of Labor, Bureau of Labor Statistics, measures occupational incident rates, including total recordable cases, lost workday cases, and fatalities, associated with the work environment.

There are no data on injury/illness incident rates for the Mina rail alignment cumulative impacts region of influence; however, injury/illness incidence rates in Nevada generally run higher than those in the United States as a whole. The economic segments with the highest injury/illness incidence rates in Nevada are construction and goods-producing industries.

Additional traffic is especially a concern with the construction phases of reasonably foreseeable projects. The construction phase of a project not only brings construction workers to the work sites, but also means an increase in slow-moving and bulky traffic involving the transportation of construction equipment. Use of trucks for hauling hazardous or other dangerous materials is also an increasing concern as traffic increases on the road network. To minimize traffic impacts at the entrance to the Yucca Mountain Site, a new interchange with U.S. Highway 95 at the site entrance been proposed for both traffic flow and safety reasons. Increased traffic would not necessarily mean an increase in the rate of traffic accidents, but the number of accidents would increase if the rate of traffic accidents stayed the same and traffic increased. Therefore, transportation safety concerns would increase and there could be an increased workload for traffic-accident responders in the Mina rail alignment region of influence with the cumulative growth in traffic.

From a transportation safety standpoint, railcars loaded with live munitions and ordnance currently travel between Wabuska and the Hawthorne Army Depot. A railroad along the Mina rail alignment would reduce health and safety risks associated with accidents involving existing rail traffic because the trains would be routed away from the populated community of Schurz via one of the Schurz alternative segments.

An estimated 9,500 casks would be transported to the repository by rail using the Mina alignment. Nonradiological occupational health and safety impacts are projected as follows:

- Construction and operations activities for the Mina rail alignment are projected to result in approximately 800 recordable incidents, approximately 470 lost-workday accidents, and approximately two fatalities.
- Vehicular-related fatalities related to worker commuting are projected to result in an estimated 13 vehicular-related fatalities for the Mina rail alignment.
- Rail-related accidents and rail-related fatalities related to the movement of cask trains, maintenance trains, and supply trains are projected to result in 16 rail-related accidents and one rail-related fatality for the Mina rail alignment.

Under Module 1, approximately 21,900 casks would be transported to the repository by rail, and under Module 2, approximately 22,600 casks would be transported to the repository by rail. To estimate the cumulative health and safety impacts of Module 1 and Module 2, the impacts of the Proposed Action were increased by the ratio of the number of casks transported in Module 1 or Module 2 versus the Proposed Action. For Module 1, the nonradiological health and safety impacts noted above would increase by a factor of approximately 2.3 over the impacts under the Proposed Action. For Module 2, nonradiological safety impacts would increase by a factor of approximately 2.4 over the impacts of under Proposed Action.

Other regional activities would also cumulatively add to the totals beyond the railroad-related impacts, but cumulative nonradiological health and safety in the Mina rail alignment region of influence would be small within the context of the overall region of influence.

5.3.2.10.2 Radiological Health and Safety

Existing and reasonably foreseeable future activity (such as the Nevada Test Site and Yucca Mountain Repository activity managed by DOE) in the Mina rail alignment region of influence involves the storage, handling, transportation, use, and disposal of radioactive materials and wastes. There is an extensive regulatory framework associated with transportation safety, and the proposed railroad would operate in compliance with these laws and regulations. For example, DOE complies with U.S. Department of Transportation regulations regarding the transportation of radioactive materials. DOE also uses U.S. Environmental Protection Agency protective action guides (identifying projected dose levels at which specified actions should be taken) and actions designed to limit doses and impacts in the event of a transportation accident resulting in releases of radioactive material. The regulatory framework and implementation of appropriate standard operating procedures would reduce the potential for accidents. Coordination of plans for proposed railroad construction and operations with local emergency response providers would be important to limit the potential for accidents, and for an effective response to an accident should one occur.

There is a small risk of radiological impacts to workers and the general public from external radiation exposure during normal operations and incident-free transportation. Staff at the Nevada Test Site and the Yucca Mountain Repository would be separate, and it is not anticipated that there would be cumulative exposures to workers from both operations. The modes of transportation of radioactive wastes for the

Nevada Test Site (shipment by truck) and the Yucca Mountain Repository (shipment by rail) would differ. Radiological impacts associated with rail operations would be higher under Yucca Mountain FEIS Modules 1 or 2 operations compared to the Repository SEIS Proposed Action level of transportation. The radiological risk relationships among the repository, the proposed Mina rail alignment, and Nevada Test Site operations are summarized below.

As part of the Repository SEIS process, DOE estimated that 9 to 28 latent cancer fatalities for members of the public would result from Yucca Mountain Repository construction, operations, monitoring, and closure for the population within the 80-kilometer (50-mile) region of influence of the repository site. The estimated latent cancer fatalities correspond to a total collective dose of 15,000 to 46,000 person-rem, and the projected population within the repository region of influence is 120,000 persons. The region of influence for the Yucca Mountain Repository extends 80 kilometers (50 miles) to the northwest from the repository site boundary along the rail corridor, approximately to Scottys Junction; the remainder of the Mina rail alignment is outside of the Yucca Mountain Repository region of influence. Population within the area where the rail alignment region of influence and the Yucca Mountain repository region of influence coincide (between the repository boundary and the Scottys Junction area) would receive radiation dose from both the repository and from the Mina rail line operation. Members of the public situated along the rail alignment but outside of the region of influence of the Yucca Mountain Repository would receive a negligible radiation dose from the repository.

For members of the public along the rail line, DOE estimated that there could be up to 8.5×10^{-4} latent cancer fatality, corresponding to a collective population dose of 1.4 person-rem, for the Mina rail alignment. Therefore, for members of the public situated along the rail alignment, the radiological impacts of railroad operations would be a very small contribution to the overall radiological impacts of the Yucca Mountain Repository.

The estimated radiological dose to members of the public from Nevada Test Site operations in 2005 was 0.2 mrem per year; the maximum radiation dose was 2.3 mrem per year at the northwest corner of the Nevada Test Site boundary. Dose at off-site populated locations between 20 kilometers and 80 kilometers (12 to 50 miles) from this location would experience much lower radiation doses due to wind dispersion (*Nevada Test Site Environmental Report 2005,* DIRS 182285-Wills 2006, Table 8-4, p. 8-2). The collective population dose from Nevada Test Site operations was below 0.6 person-rem in 2004 (*Nevada Test Site Environmental Report 2005,* DIRS 182285-Wills 2006, Table 8-3, p. 8-8.) Radiation dose from Nevada Test Site operations would be a very small contribution to the overall radiological impacts of the Yucca Mountain repository.

Operation of the proposed railroad along the Mina rail alignment under the Proposed Action would result in a small contribution to cumulative radiological health and safety impacts. Cumulative radiological impacts in the Mina rail alignment region of influence would be small.

5.3.2.11 Utilities, Energy, and Materials

5.3.2.11.1 Utilities

From a cumulative impacts perspective within the Mina rail alignment region of influence, utility crossings are and will continue to be commonplace with little impact other than minor ground disturbance. Utility and other right-of-way crossings are common to linear projects such as roads, railroads, and pipelines. Land areas for the proposed rail alignment, construction camps, quarries, and access roads would cross or encroach upon existing or proposed utility rights-of-way in a variety of locations. Land areas for operations support facilities could also encroach upon existing or proposed utility rights-of-way. This situation would be typical for other rights-of-way in the region. The crossings would be accomplished with small impact using standard engineering procedures and appropriate design details.

Many regional activities, including the proposed railroad, would increase demands on public water systems, wastewater systems, telecommunications systems, electric power systems, and other utilities. However, regional service providers are projected to be able to adjust to any increasing demand, and overall cumulative impacts to utilities would be small.

5.3.2.11.2 Energy and Materials Usage

Large projects such as pipelines, transmission lines, and power plants, that could occur within the Mina rail alignment cumulative impacts region of influence require materials and energy to construct and operate. Energy and material resources necessary for construction or operation of these projects are often obtained within regional or, in some cases, national markets.

For this Rail Alignment EIS, DOE analyzed cumulative energy and materials supply and demand from a regional perspective. Energy and materials (for example, steel and concrete) that would be needed for railroad construction and operations are not constrained in regional markets, and railroad needs would represent a small percentage of the cumulative annual materials use within the Mina rail alignment cumulative impacts region of influence.

While the regional markets for various construction-related materials and energy sources will continue to grow as the region develops, there is no evidence of potential limits to growth from constrained material or energy supplies. Cumulative impacts from energy and materials usage in the Mina rail alignment region of influence would be small.

5.3.2.12 Hazardous Materials and Waste

5.3.2.12.1 DOE Waste-Management Activities

DOE has had existing waste management programs at the Nevada Test Site for several decades. While the Site missions have changed over time (with an emerging focus on national security, energy, and environmental issues), waste management and disposal at the Site has been one of the primary long-term land uses. There are two active waste management and disposal sites on the Nevada Test Site:

- Area 5 occupies 2.9 square kilometers (720 acres) and is in Frenchman Flat north of Mercury, Nevada.
- Area 3 occupies 0.53 square kilometer (130 acres) north of Mercury in Yucca Flat.

Environmental restoration efforts are under way at various locations throughout the Nevada Test Site. The Nevada Test Site waste-management program currently includes management and disposal operations for hazardous waste, mixed waste, and low-level radioactive waste. Transportation of the waste is accomplished by truck from both on-site and off-site sources. There are no plans for Nevada Test Site activities to include use of the proposed Mina rail alignment for shipment of wastes.

The proposed railroad's contribution to cumulative impacts associated with DOE waste-management activities on the Nevada Test Site would be small.

At present, Yucca Mountain Repository-development efforts are focused on preparing an application to the U.S. Nuclear Regulatory Commission for a authorization to construct the repository for spent nuclear fuel and high-level radioactive waste. The Yucca Mountain FEIS (DIRS 155970-DOE 2002, all) and the

Repository SEIS (DOE/EIS-0250F-S1, all) describe proposed operations at the Yucca Mountain Site in detail.

5.3.2.12.2 Sanitary and Construction Wastes

As the populated areas in the Mina rail alignment cumulative impacts region of influence expand and grow, the volume of sanitary waste generated will also expand. Project proponents are legally required to dispose of nonhazardous and nonradiological construction and other solid waste in appropriately permitted solid waste landfills. Nevada has 24 operating municipal landfills with a combined capacity to accept more than 11,000 metric tons (12,000 tons) of waste per day. However, the number of operating landfills has decreased substantially over the past 15 years, and while there is sufficient capacity to accept waste for the State of Nevada as a whole, there are some areas such as Pahrump that have limited capacity for future years.

Construction- and operations-related waste that would be associated with the proposed Mina rail alignment would add only a fraction of a percent to the total waste stream in the state. If there were a constraint to landfill capacity at some future time, additional land would be needed to expand or open a new landfill. Because of the relative scarcity of private land in the Mina rail alignment region of influence, any land used for this purpose might need to come from BLM-administered federal land. As an alternative to local government landfill provisions, private companies can also be expected to seek business opportunities to provide solid-and hazardous-waste management, transportation, and disposal.

DOE would store and use hazardous materials (such as oil, gasoline and solvents) during the Mina rail alignment construction, and would control and manage these materials in accordance with the extensive federal and state regulatory framework. Other major projects would have similar waste streams, and project plans and requirements would call for disposal of such wastes in permitted facilities and materials management according to accepted industry practices.

The proposed railroad's contribution to impacts from the generation and management of sanitary and construction wastes would be small. Cumulative impacts to waste disposal facilities in the Mina rail alignment region of influence would be small.

5.3.2.13 Cultural Resources

Cultural resources include historic and archeological sites, buildings, structures, landscapes, and objects. Most reasonably foreseeable projects in the Mina rail alignment cultural resources region of influence will involve at least some ground disturbance. With that ground disturbance, cultural resources could be destroyed, damaged, or discovered for recovery or mitigation. As part of the evaluation of proposed projects on federal land, the existing regulatory framework requires that cultural resources be identified and protected. With information on the location of a proposed project and the estimated extent of ground disturbance, cultural resource specialists can be called on to perform appropriate surveys and inventories of cultural resources in the potentially disturbed area. Once discovered, the sites of cultural resources are kept confidential to reduce the potential for vandalism or theft of the resources.

Because cultural resources are typically on or below the ground, they can be damaged by other activities such as off-highway vehicle use. As the major land manager in the Mina rail alignment region of influence, the BLM has an extensive cultural resource management program and manages federal land with protection of cultural resources as a key management objective. Once ground is disturbed and facilities are constructed on the land, the opportunity for identification of cultural resources is usually lost. Therefore, the BLM and other land managers in the area (for example, DOE on the Nevada Test Site and the U.S. Air Force on the Nevada Test and Training Range) employ cultural resource specialists and involve tribal representatives, as appropriate. Commonly, mitigation for any ground disturbance in the

Mina rail alignment region of influence includes the involvement of these cultural resource specialists as potential cultural resources are discovered. Other activities occurring on federal land, such as off-road vehicle use and rock collecting, can cause unintended adverse impacts to cultural resources. Mission activities occurring at the Nevada Test Site, the Nevada Test and Training Range, and the Yucca Mountain Repository also could cause unintended adverse impacts to cultural resources.

The problem of vandalism to and theft of cultural resources is prevalent throughout the western United States. Land-management agencies such as the BLM make extensive attempts to protect locations of cultural resources, but the areas to be managed are often so vast that patrols by law enforcement are not effective in protecting these sites. DOE, the BLM, and other federal agencies in the Mina rail alignment region of influence are committed to public education and employee training regarding the protection of cultural resources.

Visitors may also be drawn to the area for purposes of curiosity and sight-seeing. Based on the extent of cultural resource site finds on BLM-administered land and on the Nevada Test Site, and data collected to date on the proposed Mina rail alignment, there could be a large number of cultural resources in the Mina rail alignment region of influence. Also, it is likely that only a portion of any currently undiscovered sites would ultimately be found eligible for the *National Register of Historic Places*.

The railroad would be a major new construction project introduced into a remote area. Beyond the implications of ground disturbance and permanent and temporary use areas, railroad construction and operations would bring employees, visitors, and equipment into an area where prior access was limited. If right-of-way roads remain open to the public, there could be an increase in off-road vehicles traveling along newly constructed roads and illegal use of lands. As the number of visitors increases, so does the potential for vandalism and damage to cultural resources. There is an extensive regulatory framework to manage and protect cultural resources.

Impacts to cultural resources in the Mina rail alignment region of influence would be small because the Department would conduct intensive field surveys and implement mitigation measures, including avoidance. Other project proponents would be subject to the same regulatory framework and BLM policies and procedures. Cumulative impacts to cultural resources in the Mina rail alignment region of influence would be small.

5.3.2.14 Paleontological Resources

Regional protection, management, and impact issues relative to paleontological resources are similar to those of cultural resources. Any type of ground disturbance could disturb or destroy known or unknown paleontological resources. Impacts to paleontological resources would generally be measured by physical damage to fossil-bearing formations through excavation or surface disturbance. The primary cumulative impact mechanisms that could affect paleontological resources include excavations or surface disturbances associated with approval and implementation of BLM rights-of-way, off-highway vehicle use, minerals development, land disposals, and special designations. Many BLM management activities, however, serve to protect and mitigate impacts to paleontological resources. Knowledge of the outcrop pattern of geologic units, and the kinds and quality of the fossils produced by such units, is a critical management tool for land-use decision-making where fossils might be involved. Potential effects on paleontological resources from ground disturbance would continue to be a major regional concern of BLM from both resource management planning and rights-of-way evaluation perspectives. Most formations the rail line would cross are volcanic and would not contain paleontological resources.

Any paleontological resources are considered valuable and are often collected for their cultural, scientific, and recreational values. Therefore, these resources are sometimes removed from federal lands. While common invertebrate fossils such as plants, mollusks, and trilobites can be collected for personal use in reasonable quantities, the lack of regular site monitoring and public education about fossil collecting has led to increased illegal commercial taking of paleontological resources. Paleontological resources are also vulnerable to intentional or unintentional vandalism. The specific locations of some identified paleontological resources are kept confidential to avoid vandalism or theft.

The most likely locations of currently unknown paleontological resources can be identified based on geological characteristics, and potential impacts can be avoided or minimized through careful project planning and implementation. Most formations the rail line would cross are volcanic and would not contain paleontological resources. Therefore, the proposed railroad project would not contribute to cumulative impacts to paleontological resources.

5.3.2.15 Environmental Justice

5.3.2.15.1 Potential Effects to Low-Income and Minority Populations

Environmental justice impacts result when high and adverse human health or environmental impacts fall disproportionately on low-income and minority populations. If high and adverse impacts are found to have disproportionate impacts on environmental justice populations as compared to the general population of the area, the impacts would be mitigated to the extent practicable by the federal agencies involved in the proposed action.

Based on individual and group values, beliefs, and goals, there is a difference in perspective as to the potential effects of activities in the Mina rail alignment region of influence on low-income and/or minority populations among the different stakeholders and other interested parties. The American Indian Resource Document (DIRS 174205-Kane et al. 2005) discusses cultural resources, American Indian values and their relationship to environmental justice, and broader American Indian values. DOE considers the American Indian Writers Subgroup conclusions to be responsible opposing viewpoints for purposes of its environmental justice responsibilities. DOE has concluded that there are no identifiable environmental or human health impacts associated with the proposed railroad that would disproportionately affect low-income or minority populations. Additionally, there are no identified effects to special pathways (such as subsistence hunting and gathering) in the Mina rail alignment region of influence.

The largest concentration of low-income or minority populations along the Mina rail corridor occurs in Mineral County and on the Walker River Paiute Reservation. The corridor would cross American Indian tribal lands, with the four Schurz alternative segments almost entirely on the Walker River Paiute Reservation (DIRS 180222-BSC 2006). There are approximately 1.4 square kilometers (350 acres) of reservation lands in the corridor (DIRS 180222-BSC 2006). The population of the reservation, estimated to be 853 persons in 2000, is low-income and consists mainly of American Indians, a minority population. The poverty rate in Mineral County is 15 percent, which exceeds the rate of poverty (11 percent) in the State of Nevada, while the poverty rate of Walker River Paiute Reservation residents is 32 percent, nearly three times the rate of poverty in the state. The only moderate or large impacts that were identified relate to noise impacts from construction. These impacts would not occur on the Walker River Paiute Reservation; therefore, there would be no large and adverse effects that would disproportionately affect a low income or minority community and there are no special pathways that would result in disproportionately large and adverse effects to low income or minority communities.

DOE has concluded that there are no identifiable human health or environmental impacts associated with the proposed railroad that would disproportionately affect low-income or minority populations, nor has the Department identified any special pathways for impacts (such as subsistence hunting and gathering) in the Caliente region of influence.

Cumulative impacts to low-income or minority populations along the Caliente rail alignment would be would be small, if any.

5.3.2.15.2 Economic Opportunity

Existing and reasonably foreseeable projects and activities in the Mina rail alignment region of influence would present economic opportunities for some persons in the area. Economic opportunities include employment, wages, revenue from business operation, and other economic stimuli associated with growth and development. DOE and other project proponents in the Mina rail alignment region of influence have a legally mandated equal opportunity approach to these economic opportunities. Any potential for economic gain would be distributed equally to persons or businesses in the area that seek employment or business opportunity. While not all persons would gain economically from the cumulative group of projects and activities, the opportunity for gain does not favor one population group or another based on minority or income status.

Because there would be small changes in long-term population attributable to activities in the corridor, impacts or stresses to the housing stock, infrastructure systems, or social services would be unlikely. Socioeconomic impacts from railroad construction and operations along the Mina rail corridor would be small overall and would be unlikely to adversely or disproportionately affect the low-income or minority populations along the corridor.

5.4 Combined Repository and Nevada Rail Transportation Impacts

This section presents the total estimated environmental impacts for the proposed construction, operation, monitoring, and closure of the repository combined with the environmental impacts from the proposed Nevada transportation activities. As construction along the rail alignment approached the physical location of the repository and its surface facilities, the potential for impacts to overlap would increase.

Table 5-4 provides an overview of the total combined impacts of the proposed repository and railroad in Nevada within overlapping regions of influence. In most instances, DOE evaluated the potential impacts qualitatively and judged them to be small. However, there are several air quality and groundwater impacts from the repository and the railroad actions that DOE was able to sum and quantify:

- Air Quality. The air quality impacts from simultaneous construction of the proposed repository and of the railroad and associated rail facilities would not produce criteria air pollutant concentrations that exceeded the regulatory limit at the boundary of the analyzed repository land withdrawal area.
- Groundwater. Groundwater withdrawals would occur for both the repository and railroad actions from the same hydrographic area, specifically Area 227A, Jackass Flats. DOE has analyzed water demand from both actions to gauge overall impacts to groundwater resources in the Jackass Flats area. The highest combined annual water demand for railroad and repository activities would be below the Nevada State Engineer's ruling of perennial yield (the amount that can be withdrawn annually without depleting reserves) for the Jackass Flats hydrographic area. The combined demand would also be lower than the lowest estimated perennial yield for the western two-thirds of this hydrographic area. Coupled with the demand for Nevada Test Site activities in Jackass Flats, the total annual water demand would exceed the lowest estimated value of perennial yield for the western two-thirds of the hydrographic area during only one year. However, this estimated total combined water demand would still be below estimated values of perennial yield for the entire hydrographic area for all years. The combined repository and railroad actions would withdraw groundwater that would

Table 5-4. Summary of combined repository and Nevada railroad impacts (page 1 of 3).

Resource area	Summary of repository and Nevada rail transportation impacts that occur within overlapping regions of influence
Land use and ownership	About 12 square kilometers of disturbed land; 600 square kilometers of land withdrawn from public use.
Air quality	Nye County is the only location where Nevada rail transportation impacts would overlap the repository region of influence. The Nevada rail transportation emissions would be distributed over the entire county and only the southern portion of the emissions from Nye County would be within the repository region of influence. Modeled concentrations of criteria pollutants at the boundary of the repository land withdrawal area would not exceed regulatory limits during simultaneous construction of the repository and railroad. Concentrations of all criteria air pollutants except for particulate matter would be less than 6 percent of the regulatory limit. Concentrations of $PM_{2.5}$ would not exceed 37 percent, and concentrations of PM_{10} would not exceed 84 percent of the regulatory limit. The simultaneous operation of the repository and railroad would not exceed regulatory limits.
Hydrology	
Surface water	At least two of the drainage channels and floodplains (Busted Butte Wash and Drill Hole Wash) the rail line would cross would also be affected by construction of repository surface facilities.
Groundwater	Water identified for rail line construction includes 572 acre-feet (over 4 years) plus 6 acre-feet per year for operations, all from the same groundwater basin as for repository activities. A peak annual water demand of 530 acre-feet would result from the combined Nevada rail transportation and repository needs, but this high level would last only 1 year. The average annual water demand for the combined construction period would be 400 acre-feet. All of the combined water demand levels would be below the lowest estimate of the groundwater basin's perennial yield (580 acre-feet). The year of highest water demand would not result in a well drawdown that could affect the nearest public or private wells. Modeling for the Yucca Mountain FEIS showed small to moderate impacts from the Proposed Action groundwater withdrawals that are still applicable. The model's assumed withdrawal rate of 430 acre-feet per year is lower than the peak water demand, but over the life of the project, is still conservatively high.
Biological resources and soils	Loss of up to 12 square kilometers of desert soil, habitat, and vegetation, but no loss of rare or unique habitat or vegetation; adverse impacts to individual threatened desert tortoises and loss of a small amount of low-density tortoise habitat, but no adverse impacts to the species as a whole; reasonable and prudent measures would minimize impacts.
Cultural resources	Small potential for impacts; including three National Register-eligible prehistoric sites; opposing American Indian viewpoint.

Table 5-4. Summary of combined repository and Nevada railroad impacts (page 2 of 3).

Resource area	Summary of repository and Nevada rail transportation impacts in overlapping regions of influence
Socioeconomics	
New jobs (percent of workforce in affected counties	Peak increases would be small, less than 1 percent in the region, Clark County, and Nye County when construction of repository and the railroad overlap.
Peak real disposable income (million dollars)	For repository: In Clark County (2034), $58.3 million; in Nye County (2035) $27.5 million.
	For railroad: In Clark County (2011) $100.6 million; in Nye County (2012) $9.6 million.
Peak incremental gross regional product (million dollars)	For repository: In Clark County (2034), $98.7 million; in Nye County (2034) $68.9 million.
	For railroad: In Clark County (2012), $154.5 million; in Nye County (2012), $42.8 million.
Occupational and public health and safety	
Public, radiological	
Maximally exposure individual (probability of a latent cancer fatality)	Not applicable
Population (latent cancer fatalities)	Not applicable
Public, nonradiological	
Fatalities due to emissions	Not applicable
Workers (involved and noninvolved)	
Radiological (latent cancer fatalities)	Not applicable
Nonradiological fatalities (includes commuting traffic fatalities)	Not applicable
Accidents	
Public, Radiological	
Maximally exposed individual (probability of a latent cancer fatality)	Not applicable
Population (latent cancer fatalities)	Not applicable
Workers	Not applicable
Noise and vibration	Impacts to public would be small due to large distances from the repository to residences; workers exposed to elevated noise levels; controls and protection would be used as necessary.
Aesthetics	The exhaust ventilation stacks on the crest of Yucca Mountain could be an aesthetic aggravation to American Indians. If the Federal Aviation Administration required beacons atop the stacks, they could be visible for a great distance, especially west of Yucca Mountain.

Table 5-4. Summary of combined repository and Nevada railroad impacts (page 3 of 3).

Resource area	Summary of repository and Nevada rail transportation impacts in overlapping regions of influence
Utilities, energy, materials, and site services	Use of materials would be small in comparison to regional use; some effect on public water systems and public wastewater treatment facilities due to population growth from construction and operations employment; annual fossil-fuel use would be less than 7 percent of state-wide use during construction and less than 2 percent of state-wide use during operation; electric power delivery system to the Yucca Mountain site would have to be enhanced.
Waste and hazardous materials	Small impacts from nonhazardous waste (solid and industrial waste) disposal to disposal capacities of local solid waste facilities near Yucca Mountain in Nye, Esmeralda, Clark, and Lincoln counties.
Environmental justice	No high and adverse impact to population as a whole; no specific pathways for minority populations; therefore no high and adverse impacts to minorities and low income populations; opposing American Indian viewpoint.
Manufacturing repository components	Not applicable.
Airspace restrictions	Small impacts to airspace use; airspace restriction could be lifted once operations have been completed.

otherwise move into aquifers of the Amargosa Desert, but the combined water demand for the railroad, the repository, and Nevada Test Site activities in Jackass Flats would have, at most, small impacts on the availability of groundwater in the Amargosa Desert area in comparison with the quantities of water already being withdrawn there.

6. STATUTORY, REGULATORY, AND OTHER APPLICABLE REQUIREMENTS

This chapter identifies the permits and approvals, Federal Government and State of Nevada regulations, and Executive and DOE Orders that could apply to construction and operation of the proposed railroad.

Glossary terms are shown in ***bold italics***.

During proposed ***railroad*** construction and operations, the U.S. Department of Energy (DOE or the Department) would comply with applicable requirements, and has developed and is implementing a comprehensive approach to the permitting and approval processes that would ensure compliance.

As illustrated in Figure 6-1, compliance with regulatory requirements is the second step in the DOE approach to avoiding, minimizing or reducing environmental ***impacts***.

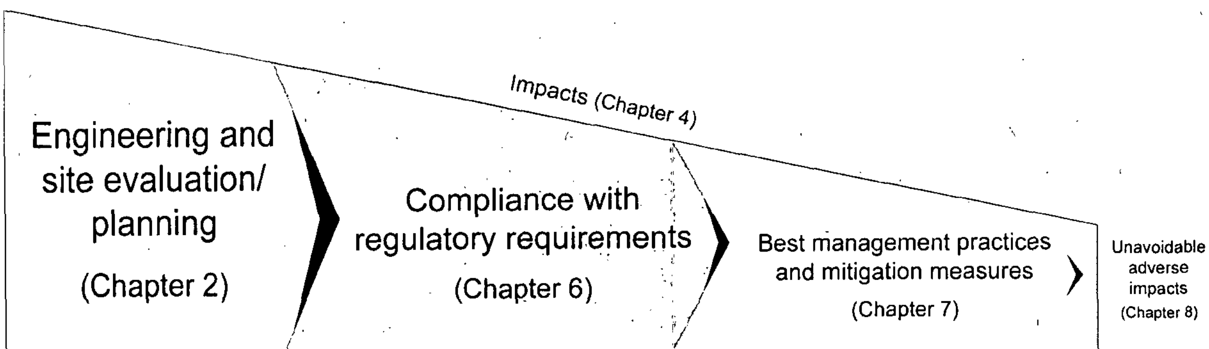

Figure 6-1. Multi-step approach to avoid, minimize, or reduce environmental impacts.

The chapter is organized as follows:

- Section 6.1 summarizes statutes and regulations that establish or affect DOE authority to construct and operate the proposed railroad.
- Section 6.2 identifies Surface Transportation Board (STB) requirements.
- Section 6.3 summarizes statutes and regulations that establish environmental protection requirements that could apply to construction and operation of the railroad.
- Section 6.4 identifies potentially applicable DOE Orders.
- Section 6.5 identifies U.S. Department of the Interior, Bureau of Indian Affairs, requirements.
- Section 6.6 identifies U.S. Department of the Interior, Bureau of Land Management (BLM), requirements.
- Section 6.7 identifies U.S. Army requirements.

Appendix A provides copies of the applicable *Federal Register* (*FR*) notices. Appendix B describes interagency and intergovernmental interactions.

6.1 Statutes and Regulations Establishing or Relating to DOE Authority to Propose, Construct, and Operate a Railroad in Nevada for Shipment of Spent Nuclear Fuel and High-Level Radioactive Waste to the Repository at Yucca Mountain

This section summarizes the statutes and regulations that establish or affect DOE authority to propose, construct, and operate the proposed railroad.

6.1.1 NUCLEAR WASTE POLICY ACT, AS AMENDED (42 UNITED STATES CODE [U.S.C.] 10101 *et seq.*)

The Nuclear Waste Policy Act, as amended (NWPA), establishes the Federal Government's responsibility for the ***disposal*** of ***spent nuclear fuel*** and ***high-level radioactive waste*** and generators' responsibility to bear the costs of disposal. The NWPA identified the ***Yucca Mountain Site*** in Nye County, Nevada, as the only site to be studied as a potential location for a ***geologic repository***. As part of its obligations under the NWPA, DOE is responsible for developing a system to transport spent nuclear fuel and high-level ***radioactive*** waste to the repository. On April 8, 2004, DOE published *Record of Decision on Mode of Transportation and Nevada Rail Corridor for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV* (69 *FR* 18557) announcing the selection, both nationally and in the State of Nevada, of the mostly rail scenario analyzed in the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* 155970 (DIRS 155970-DOE 2002, all) as the mode of transportation for shipping spent nuclear fuel and high-level radioactive waste to Yucca Mountain and selected the Caliente ***rail corridor*** to evaluate alignments for a ***rail line***.

6.1.2 YUCCA MOUNTAIN DEVELOPMENT ACT OF 2002 (PUBLIC LAW 107-200)

On February 15, 2002, President George W. Bush approved the Secretary of Energy's recommendation of Yucca Mountain as the site for the development of a repository for the disposal of spent nuclear fuel and high-level radioactive waste. The House of Representatives approved the Yucca Mountain Site on May 8, 2002, as did the Senate on July 9, 2002. This approval of the site at Yucca Mountain became known as the Yucca Mountain Development Act, which the President signed into law on July 23, 2002. This Act is a joint resolution of the House of Representatives and Senate approving the site at Yucca Mountain, Nevada, for the development of a repository for the disposal of spent nuclear fuel and high-level radioactive waste, pursuant to the Nuclear Waste Policy Act of 1982, as amended.

6.1.3 ATOMIC ENERGY ACT, AS AMENDED (42 U.S.C. 2011 *et seq.*)

The Atomic Energy Act of 1954, as amended, provides fundamental jurisdictional authority to DOE and the U.S. Nuclear Regulatory Commission (NRC) over governmental and commercial use of nuclear materials. This Atomic Energy Act ensures proper management, production, possession, and use of radioactive materials. In accordance with the Atomic Energy Act, DOE established a system of requirements issued as DOE Orders.

The Atomic Energy Act gives the Nuclear Regulatory Commission specific authority to regulate the possession, transfer, ***storage***, and disposal of nuclear materials, and aspects of transportation packaging design for radioactive materials, including testing for packaging certification. Nuclear Regulatory Commission regulations applicable to the transportation of radioactive materials (10 Code of Federal Regulations [CFR] Parts 71 and 73) require that shipping ***casks*** meet specified performance criteria under both normal transport and hypothetical ***accident*** conditions. DOE and Nuclear Regulatory Commission regulations applicable to protection against ***radiation*** (10 CFR Parts 20 and 835) address occupational ***dose*** limits, public dose limits, survey and monitoring procedures, ***exposure*** controls, respiratory protection and controls, precautionary procedures, and related topics. DOE would comply with all applicable radiation protection regulations during operation of the proposed railroad.

6.2 Surface Transportation Board Requirements

If DOE selected the ***Shared-Use Option*** as part of the ***Proposed Action***, DOE would have to apply to the STB for a license to construct and operate the proposed rail line (known as a "certificate of public convenience and necessity"). If DOE did not select the Shared-Use Option, the STB would have no regulatory authority related to the Proposed Action. The Shared-Use Option involves operating the proposed railroad as a common-carrier railroad – one that holds itself out to the public for service and has an obligation to provide rail service to any and all shippers that request service along that line.

The STB has exclusive jurisdiction over the construction, acquisition, and operation of common-carrier railroads pursuant to the Interstate Commerce Act (as amended by the ICC Termination Act of 1995 [Public Law 104-88, 109 Stat. 803 (1995)]). To operate the proposed railroad under the Shared-Use Option, DOE would have to apply for a "license of public convenience and necessity" issued under 49 U.S.C. 10901 or under 49 U.S.C. 10502. The regulations prescribing how to apply for a license to construct and operate a rail line are provided in 49 CFR Part 1150. If the Department sought a license from the STB, the STB would subject the proposal to a careful review, including preparation of the environmental documentation required to meet STB obligations under the National Environmental Policy Act (NEPA), as provided in 49 CFR Part 1105.

The STB has jurisdiction over common-carrier rail lines that are part of the interstate rail network. This jurisdiction includes facilities and structures that are an integral part of rail transportation [49 U.S.C. 10501(b); 49 U.S.C. 10102(9)]. Section 10501(b) also states that "the remedies provided under this part are exclusive and preempt the remedies provided under federal and state law." The purpose of Section 10501(b) is to prevent a patchwork of local regulation from unreasonably interfering with interstate commerce. Thus, Section 10501(b) does not permit dual state and federal regulation of railroads or activities related to rail transportation at railroad facilities. This statutory framework, with supporting case law, supports the STB broad preemption authority.

The STB preemption authority applies to state or local regulation of matters directly related to the STB, and state or local pre-clearance or permitting requirements – such as zoning ordinances and environmental and land-use permitting requirements – that could be used to deny or defeat a railroad's ability to conduct its operations. Thus, a local or state body cannot deny a carrier the right to construct, develop, and maintain facilities or conduct operations, because this denial would create irreconcilable conflict with the STB's exclusive jurisdiction over such facilities and operations.

While exempt from traditional permitting, zoning, and land-use processes for railroad operations, railroads such as the one DOE proposes are not necessarily exempt from other applicable laws. The states retain the police powers reserved by the 10th Amendment of the U.S. Constitution. Pursuant to the Commerce Clause, Article I, Section 8 of the U.S. Constitution, states can take appropriate actions to protect public health and safety so long as their actions do not regulate operations or unreasonably interfere with interstate commerce.

STB environmental regulations are set forth in 49 CFR Part 1105. These rules require consideration of various environmental statutes, including NEPA, the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*), and the Energy Policy and Conservation Act (42 U.S.C. 6361; Public Law 94-163). These rules combine the STB's former environmental and energy regulations; revise and clarify environmental and historic requirements; require service of environmental reports on certain state, federal, and local agencies; and reclassify and clarify the types of actions for which environmental and other historic reports and analyses are required. For railroads providing service to commercial interests, these regulations enable applicants, interested parties, and STB environmental staff to better identify and more expeditiously resolve environmental concerns associated with proposed actions. If DOE implemented the Shared-Use Option, this Rail Alignment EIS is intended to satisfy the STB environmental analysis requirements provided for in 49 CFR Parts 1105 and 1150.

6.3 Potential Statutes, Regulations, and Executive Orders Regarding Environmental Protection Requirements

This section summarizes, according to environmental topic, the statutes, regulations, and Executive Orders that set environmental protection requirements that could apply to construction and operation of the proposed railroad.

Table 6-1 is organized by environmental topic and is a comprehensive summary of the regulatory actions DOE could take for construction and operation of the proposed railroad. This table lists the permits, licenses, approvals, statutes or regulations, and agency associated with each regulatory action. Table 6-2 lists applicable federal codified regulations, Executive Orders, and other documents and directives.

Table 6-1. Potential permits, licenses, and approvals necessary for construction and operation of the proposed railroad in the State of Nevada (page 1 of 4).

Regulatory action	Statute or regulation[a]	Agency	Activity
Air Quality			
Air quality operating permit	NAC 445B.287 *et seq.*	Nevada Division of Environmental Protection	Demonstrate control of surface disturbances and emissions of criteria pollutants.
Water Quality and Use			
Stormwater discharge permit and other National Pollutant Discharge Elimination System permits	40 CFR Part 122 NAC 445A.266	U.S. Environmental Protection Agency Nevada Division of Environmental Protection	Control of stormwater discharges and point-source discharges.
Temporary permit to work in waterways (rolling stock permit)	NRS 445A.485 NAC 445A.266 through 445A.272	Nevada Division of Environmental Protection	Work in waterways of the state.
Section 404, permit to discharge dredge or fill materials to waters of the United States	Clean Water Act, Section 404 33 CFR Part 323	U.S. Army Corps of Engineers	Discharge dredge or fill materials into waters of the United States for bridges and culverts in interstate streams, dry washes, and wetlands.

Table 6-1. Potential permits, licenses, and approvals necessary for construction and operation of the proposed railroad in the State of Nevada (page 2 of 4).

Regulatory action	Statute or regulation[a]	Agency	Activity
Water Quality and Use (continued)			
Section 401, water quality certification by State of Nevada	Clean Water Act, Section 401 40 CFR 131	U.S. Army Corps of Engineers Nevada Division of Environmental Protection, Bureau of Water Quality Planning	Section 401 review requires state certification prior to issuance of Section 404 permit to discharge dredge or fill materials to waters of the United States. The request is made by U.S. Army Corps of Engineers to Nevada Division of Environmental Protection, Bureau of Water Quality Planning, to certify that the proposed activity will not violate state or federal water standards.
Water appropriation permit	NRS 533.324 through 533.435	Nevada State Engineer	Drill wells or use existing wells to withdraw groundwater to support rail construction.
Underground water and wells	NAC 534	Nevada State Engineer	Drill wells and use wells to withdraw groundwater to support rail construction.
Septic/sewage disposal permit	40 CFR Part 122 NAC 445A.810 through 445A.925 NAC 444.750 through 444.828	U.S. Environmental Protection Agency Nevada Division of Environmental Protection	Construct and operate temporary or permanent sanitary-sewage collection systems for construction camps and railroad operations facilities.
Hazardous Materials			
Hazardous materials storage permit	NAC 459 NAC 477.323	Nevada State Fire Marshal	Store and use hazardous materials, including explosives, associated with construction and operation of the proposed railroad.
Hazardous waste generation, storage, transportation, and disposal permit	Resource Conservation and Recovery Act (42 U.S.C. 6962), Subtitle C 40 CFR Part 261 40 CFR Part 262 40 CFR Part 263 40 CFR Part 264 40 CFR Part 268 40 CFR Part 270 40 CFR Part 273 40 CFR Part 279 NRS 459.400 to 459.600	U.S. Environmental Protection Agency Nevada Division of Environmental Protection	Transport, handle, treat, store, and dispose of Resource Conservation and Recovery Act hazardous wastes used during rail construction and operation.

Table 6-1. Potential permits, licenses, and approvals necessary for construction and operation of the proposed railroad in the State of Nevada (page 3 of 4).

Regulatory action	Statute or regulation[a]	Agency	Activity
Hazardous Materials (continued)			
Hazardous waste transportation approval, exemption, or permit	Hazardous Materials Transportation Act (49 U.S.C. 1801) 49 CFR Parts 171 to 180	U.S. Department of Transportation	Shipment of hazardous waste, including spent nuclear fuel and high-level radioactive waste.
Type B package approval	10 CFR Part 71	U.S. Nuclear Regulatory Commission	Shipment of spent nuclear fuel and high-level radioactive waste.
Cultural Resources			
Protection of cultural resources and development of programmatic agreement	National Historic Preservation Act (16 U.S.C. 470 *et seq.*) The Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*) The Antiquities Act (16 U.S.C. 431 through 433) The American Indian Religious Freedom Act (42 U.S.C. 1996) The Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq.*) 36 CFR Part 79 36 CFR Part 800	Advisory Council on Historic Preservation Nevada State Historic Preservation Office	Protect cultural resources; applicable to all activities that disturb the land.
Ecology and Habitat			
Endangered species consultation	50 CFR Part 402	U.S. Fish and Wildlife Service	Protect listed threatened and endangered species and designated critical habitat; applicable to all activities that disturb the habitat of threatened and endangered species.
Land and Water Use			
Free-use permit for sand and gravel	43 CFR Part 3600	Bureau of Land Management	Use sand, stone, and gravel from public lands during construction of the rail line.

Table 6-1. Potential permits, licenses, and approvals necessary for construction and operation of the proposed railroad in the State of Nevada (page 4 of 4).

Regulatory Action	Statute or Regulation[a]	Agency	Activity
Land and Water Use (continued)			
Right-of-way reservations	43 CFR Part 2800	Bureau of Land Management	Obtain rights-of-way for access to land that is needed for construction, operation, and access to the rail line, roads, construction camps, borrow pits, and other facilities.
Permit for a ***public water system***	NAC 445A.602 through 445A.612	Nevada Division of Environmental Protection	Construct and operate a public water-supply system at construction camps and some railroad operations facilities.
Construction			
Communication system authorization	Communications Act 47 CFR Part 17 47 CFR Part 24	Federal Communications Commission	Construct and operate a radio system and install fiber optics.
Operating permit for construction/labor camps	NRS 444.130 *et seq.*	Nevada State Health Division	Maintain specified conditions for construction and labor camps in Nevada.
Permit to cross state highways (occupancy permit)	NRS 408.423 NRS 408.423 through 408.427 NAC 703.455	Nevada Department of Transportation Nevada Public Utilities Commission	Construct rail line across a state highway or occupy a highway right-of-way. Applies also to construction of access roads, water pipelines, and other infrastructure that would intersect highway rights-of-way.

a. CFR = Code of Federal Regulations; NAC = Nevada Administrative Code; NRS = Nevada Revised Statutes; RCRA = Resource Conservation and Recovery Act.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 1 of 11).

Regulation/Order	Title	Subject
Regulation[a]		
7 CFR Part 658	Farmland Protection Policy Act	Law minimizes the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses.
10 CFR Part 20	Standards for Protection Against Radiation	Standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the Nuclear Regulatory Commission.
10 CFR Part 34	Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations	Requirements for the issuance of licenses for the use of sealed sources containing byproduct material and radiation safety requirements for persons using sealed sources in industrial radiography.
10 CFR Part 71	Packaging and Transportation of Radioactive Material	Requirements for packaging, preparation for shipment, and transportation of licensed fissile material.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 2 of 11).

Regulation/Order	Title	Subject
10 CFR Part 73	Physical Protection of Plants and Materials	Requirements for the establishment and maintenance of a physical protection system which have capabilities for the protection of special nuclear material.
10 CFR Part 75	Safeguards on Nuclear Material–Implementation of U.S./International Atomic Energy Agency Agreement	Establishes a system of nuclear material accounting and nuclear material control to implement the agreement between the United States and the International Atomic Energy Agency for the Application of Safeguards in the United States.
10 CFR Part 830	Nuclear Safety Management	Standards for governing the conduct of DOE contractors, DOE personnel, and other persons conducting activities (including providing items and services) that affect the safety of DOE nuclear facilities.
10 CFR Part 835	Occupational Radiation Protection	Radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.
10 CFR Part 860	Trespassing on Department of Energy Property	Requirements for the protection and security of facilities, installations and real property subject to the jurisdiction or administration, or in the custody of, DOE.
10 CFR Part 1010	Conduct of Employees	Standards for conduct of employees of the Department of Energy, excluding employees of the Federal Energy Regulatory Commission.
10 CFR Part 1021	National Environmental Policy Act Implementing Procedures	Establishes the procedures that the Department of Energy (DOE) shall use to comply with section 102(2) of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4332(2)) and the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR parts 1500-1508). To be used in conjunction with the CEQ Regulations.
10 CFR Part 1022	Compliance with Floodplain/Wetland Environmental Review Requirements	Policy and procedures for discharging DOE responsibilities under Executive Order 11988 and Executive Order 11990, including: DOE policy regarding the consideration of floodplain and wetland factors in DOE planning and decisionmaking; and DOE procedures for identifying proposed actions located in a floodplain or wetland, providing opportunity for early public review of such proposed actions, preparing floodplain or wetland assessments, and issuing statements of findings for actions in a floodplain.
25 CFR Part 162	Leases and Permits	Policies and procedures for lease of tribal lands, Bureau of Indian Affairs.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 3 of 11).

Regulation/Order	Title	Subject
25 CFR Part 169	Rights-of-Way Over Indian Lands	Procedures, terms, and conditions under which rights-of-way over and across tribal land, individually owned land, and government-owned land may be granted.
29 CFR Part 1910	Occupational Safety and Health Standards	Standards for industry and business for occupational safety and health.
29 CFR Part 1926	Safety and Health Regulations for Construction	Standards for safety and health for construction activities.
29 CFR Part 1960	Recordkeeping and Reporting	Basic program elements for occupational safety and health programs and related matters for federal employees.
33 CFR Part 323	Permits for Discharges of Dredged or Fill Material into Waters of the United States	Policies, practices, and procedures, to be followed by the Army Corps of Engineers to review of applications for permits to authorize the discharge of dredged or fill material into waters of the United States pursuant to Section 404 of the Clean Water Act.
36 CFR Part 79	Curation of Federally-Owned and Administered Archaeological Collections	Standards, procedures and guidelines to be followed by federal agencies to preserve collections of prehistoric and historic material remains, and associated records, recovered under the authority of the Antiquities Act, the Reservoir Salvage Act, section 110 of the National Historic Preservation, Act or the Archaeological Resources Protection Act.
36 CFR Part 296	Protection of Archaeological Resources: Uniform Regulations	Standards and procedures for federal land managers to provide protection for archaeological resources, located on public lands and Indian lands of the United States.
36 CFR Part 800	Protection of Historic and Cultural Properties	Procedures for federal agencies to meet statutory responsibilities for historic preservation concerns with the needs of historic properties.
40 CFR Part 50	National Primary and Secondary Ambient Air Quality Standards	National primary and secondary ambient air quality standards.
40 CFR Part 60	Standards of Performance for New Stationary Sources	Air standards of performance for new stationary Sources.
40 CFR Part 61	National Emission Standards for Hazardous Air Pollutants	Emission standards for hazardous air pollutants.
40 CFR Part 63	National Emission Standards for Hazardous Air Pollutants for Source Categories	Emission standards for hazardous air pollutants for source categories.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 4 of 11).

Regulation/Order	Title	Subject
40 CFR Part 68	Chemical Accident Prevention Provisions	List of regulated substances and threshold quantities, and accident prevention regulations, the petition process for adding or deleting substances to the list of regulated substances, the requirements for owners or operators of stationary sources concerning the prevention of accidental releases, and the State accidental release prevention programs.
40 CFR Part 112	Oil Pollution Prevention	Procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines.
40 CFR Part 122	EPA Administered Permit Programs: The National Pollutant Discharge Elimination System	Permit programs for the National Pollutant Discharge Elimination System that requires permits for the discharge of "pollutants" from any "point source" into "waters of the United States."
40 CFR Part 125	Criteria and Standards for National Pollutant Discharge Elimination System	Criteria and standards for technology-based treatment requirements for permits under the National Pollutant Discharge Elimination System.
40 CFR Part 131	Water Quality Standards	Requirements and procedures for developing, reviewing, revising, and approving water quality standards by the states for Section 404 Permits for Discharges of Dredged or Fill Material into Waters of the United States.
40 CFR Part 136	Guidelines for Establishing Test Procedures for Analysis of Pollutants	Guidelines for test procedures for analysis of pollutants to be used to perform measurements of waste constituents specified for a state having an approved National Pollutant Discharge Elimination System program.
40 CFR Part 141	National Primary Drinking Water Regulations	Primary standards for public drinking water supplies, including maximum contaminant levels, and sampling and analysis, monitoring and reporting, and recordkeeping requirements.
40 CFR Part 142	National Primary Drinking Water Regulations Implementation	Regulations for the implementation and enforcement of the national primary drinking water regulations contained in 40 CFR Part 141.
40 CFR Part 143	National Secondary Drinking Water Regulations	Secondary standards for public drinking water supplies that primarily affect the aesthetic qualities relating to the public acceptance of drinking water.
40 CFR Part 260	Hazardous Waste Management System: General	Definitions of terms, general standards, and overview information applicable to parts 260 through 265 and 268 that sets forth the requirements for hazardous waste generators, transporters, or owners or operators of treatment, storage, or disposal facilities.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 5 of 11).

Regulation/Order	Title	Subject
40 CFR Part 261	Identification and Listing of Hazardous Waste	Standards and criteria for identifying the characteristics of hazardous waste and for listing hazardous waste.
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste	Standards for generators of hazardous waste.
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste	Standards for transporters of hazardous waste.
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	Standards for hazardous waste treatment, storage, and disposal facilities.
40 CFR Part 265	Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	Interim standards for hazardous waste treatment, storage, and disposal facilities.
40 CFR Part 268	Land Disposal Restrictions	Identifies hazardous wastes that are restricted from land disposal and defines treatment requirements for which an otherwise prohibited waste may be land disposed.
40 CFR Part 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program	Hazardous waste permit requirements, including application requirements, standard permit conditions, and monitoring and reporting requirements.
40 CFR Part 273	Standards for Universal Waste Management	Requirements for managing universal waste, including batteries, pesticides, thermostats, and lamps.
40 CFR Part 279	Standards for the Management of Used Oil	Standards for used oil generators, transporters, transfer facilities, collection centers, and processors and re-refineries.
40 CFR Part 302	Designation, Reportable Quantities, and Notification	Standards for designation, reportable quantities, and notification requirements for hazardous substances.
40 CFR Part 355	Emergency Planning and Notification	Establishes the list of extremely hazardous substances, threshold planning quantities, and facility notification responsibilities necessary for the development and implementation of state and local emergency response plans.
40 CFR Part 370	Hazardous Chemical Reporting: Community Right-to-Know	Reporting requirements that provide the public with important information on the hazardous chemicals in their communities for the purpose of enhancing community awareness of chemical hazards and facilitating development of state and local emergency response plans.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 6 of 11).

Regulation/Order	Title	Subject
40 CFR Part 372	Toxic Release Chemical Reporting: Community Right-to-Know	Requirements for informing the public and the communities surrounding covered facilities about the release of toxic chemicals under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986.
40 CFR Part 503	Standards for the Use or Disposal of Sewage Sludge	General requirements, pollutant limits, management practices, and operational standards for the final use or disposal of sewage sludge generated during the treatment of domestic sewage in a treatment works.
40 CFR Parts 1500 through 1508	Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act	Regulations applicable to and binding on all federal agencies for implementing the procedural provisions of the National Environmental Policy Act.
41 CFR Part 101	Federal Property Management Regulations	Introductory material concerning the Federal Property Management Regulations System: its content, types, publication, authority, applicability, numbering, deviation procedure, as well as agency consultation, implementation, and supplementation.
43 CFR Part 3	Preservation of American Antiquities	Permit requirements for the preservation of ruins, archeological sites, historic and prehistoric monuments and structures, objects of antiquity, historic landmarks, and other objects of historic and scientific interest.
43 CFR Part 7	Protection of Archaeological Resources	Implementing provisions of the Archaeological Resources Protection Act of 1979, as amended, by establishing uniform definitions, standards, and procedures to be followed by federal land managers in providing protection for archaeological resources, located on public lands and Indian lands of the United States.
43 CFR Part 1600	Planning, Programming, Budgeting	Establishes a process for the development, approval, maintenance, amendment, and revision of resource management plans, and the use of existing plans for public lands administered by the Bureau of Land Management.
43 CFR Part 2300	Land Withdrawals	Procedures implementing the Secretary of the Interior's authority to process federal land withdrawal applications and, where appropriate, to make, modify, or extend federal land withdrawals.
43 CFR Part 2800	Rights-of-Way, Principles and Procedures; Rights-of-Way Under the Federal Land Policy and Management Act	Grants for necessary transportation or other systems and facilities which are in the public interest and which require the use of public lands for the purposes identified in 43 U.S.C. 1761, and administering, amending, assigning, renewing, and terminating them.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 7 of 11).

Regulation/Order	Title	Subject
43 CFR Part 3600	Mineral Materials Disposal	Procedures for the exploration, development, and disposal of mineral material resources on the public lands, and for the protection of the resources and the environment.
43 CFR Part 3620	Free Use of Petrified Wood	Terms and conditions for persons collecting limited quantities of petrified wood for noncommercial purposes consistent with the preservation of significant deposits as a public recreational resource.
47 CFR Part 17	Construction, Marking, and Lighting of Antenna Structures	Standards for construction, marking, lighting, maintenance, and inspection of antenna structures.
47 CFR Part 24	Personal Communications Services	Conditions under which portions of the radio spectrum are made available and licensed for personal communications.
49 CFR Part 40	Procedures for Transportation Workplace Drug and Alcohol Testing Programs	Procedures for conducting workplace drug and alcohol testing for the federally regulated transportation industry.
49 CFR Part 107	Hazardous Materials Program Procedures	Procedures and permits for the transportation of hazardous materials.
49 CFR Part 171	General Information, Regulations, and Definitions	General information, regulations, and definitions for the safe and secure transportation of hazardous materials in commerce.
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements	Listing and classification of materials that the Department of Transportation has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, packaging, marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those materials.
49 CFR Part 173	Shippers-General Requirements for Shipments and Packaging	Requirements for preparing hazardous materials for shipment by air, highway, rail, or water, and inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair, and rebuild containers used or intended for use in the transportation of hazardous materials.
49 CFR Part 174	Carriage By Rail	Handling, loading, and operating requirements for transport of hazardous and radioactive materials by rail.
49 CFR Part 177	Carriage By Public Highway	Requirements for transportation of hazardous materials by private, common, or contract carriers by motor vehicle, including hazardous materials training.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 8 of 11).

Regulation/Order	Title	Subject
49 CFR Part 178	Specifications for Packaging	Manufacturing and testing specifications for packaging and containers used for the transportation of hazardous materials in commerce.
49 CFR Part 179	Specifications for Tank Cars	Specifications for tanks that are mounted on or form part of a tank car and which are to be marked with a Department of Transportation specification.
49 CFR Part 180	Continuing Qualification and Maintenance of Packaging	Requirements for the maintenance, reconditioning, repair, inspection, and testing of packaging, and any other function having an effect on the continuing qualification and use of a packaging.
49 CFR Part 210	Rail Noise Emission Compliance Regulations	Inspection and testing requirements for railcars for compliance with the Railroad Noise Emission Standards established by the Environmental Protection Agency in 40 CFR part 201.
49 CFR Part 213	Track Safety Standards	Minimum safety requirements for railroad track that is part of the general railroad system of transportation.
49 CFR Part 214	Railroad Workplace Safety	Minimum federal safety standards for railroad employees involved in railroad inspection, maintenance, and construction activities.
49 CFR Part 215	Railroad Freight Car Safety Standards	Minimum federal safety standards for railroad freight cars.
49 CFR Part 217	Railroad Operating Rules	Railroad operating rules and practices with respect to trains and other rolling equipment in the railroad industry, and each railroad is required to instruct its employees in operating practices.
49 CFR Part 218	Railroad Operating Practices	Minimum requirements for railroad operating rules and practices. Each railroad may prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other special instructions.
49 CFR Part 219	Control of Alcohol and Drug Use	Minimum federal safety standards for control of alcohol and drug use by rail line employees.
49 CFR Part 220	Railroad Communications	Wireless and radio communication procedures for trains and rail line workers.
49 CFR Part 221	Rear End Marking Device–Passenger, Commuter, and Freight Trains	Minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger, commuter, and freight trains.
49 CFR Part 223	Safety Glazing Standards–Locomotives, Passenger Cars, and Cabooses	Minimum requirements for glazing materials in order to protect railroad employees and railroad passengers from injury as a result of objects striking the windows of locomotives, cabooses, and passenger cars.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 9 of 11).

Regulation/Order	Title	Subject
Regulation (continued)		
49 CFR Part 225	Railroad Accidents/Incidents: Reports, Classification, and Investigations	Reporting, classification, and investigation procedures for rail line accidents and incidents.
49 CFR Part 228	Hours of Service of Railroad Employees	Records and reporting requirements for railroad employees hours of service and construction of sleeping quarters.
49 CFR Part 229	Railroad Locomotive Safety Standards	Minimum safety requirements for locomotives.
49 CFR Part 231	Railroad Safety Appliance Standards	Safety standards for locomotives and railcars.
49 CFR Part 232	Brake System Safety Standards for Freight and Other Non-passenger Trains and Equipment	Requirements for railroad power brakes and drawbars for freight and other nonpassenger trains.
49 CFR Part 233	Signal Systems Reporting Requirements	Reporting requirements for railroad signal systems.
49 CFR Part 234	Grade Crossing Signal System Safety	Inspection, testing, and maintenance requirements for rail crossing signal systems.
49 CFR Part 235	Instructions Governing Applications for Approval of a Discontinuance or Material Modification of a Signal System or Relief from the Requirements of Part 236	Provides applications for approval to discontinue or materially modify block signal systems, interlockings, traffic control systems, automatic train stop, train control, or cab signal systems, or other similar appliances, devices, methods, or systems.
49 CFR Part 236	Rules, Standards and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances	Rules, standards and instructions for the installation, inspection, maintenance, and repair of signal and train control systems, devices, and appliances.
49 CFR Part 240	Qualification and Certification of Locomotive Engineers	Qualification and certification requirements for locomotive engineers.
49 CFR Part 395	Hours of Service of Drivers	Hours of service requirements for drivers of commercial motor vehicles.
49 CFR Part 1005	Principles and Practices for the Investigation and Voluntary Disposition of Loss and Damage Claims and Processing Salvage	Principles and practices for the investigation and voluntary disposition of loss and damage claims and processing salvage.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 10 of 11).

Regulation/Order	Title	Subject
49 CFR Part 1035	Bills of Lading	Requirements for uniform bills of lading.
49 CFR Part 1104	Filing with the Board-Copies-Verification-Service-Pleadings	Requirements for filing of pleading and other documents with the Surface Transportation Board.
49 CFR Part 1105	Procedures for Implementation of Environmental Laws	Procedures for implementation of environmental laws by the Surface Transportation Board.
49 CFR Part 1150	Certificate to Construct, Acquire, or Operate Railroad Lines	Administrative practices and procedures to obtain certification for construction, acquisition, or operation of railroad lines.
50 CFR Part 15	Wild Bird Conservation Act	Standards for the protection of wild birds.
50 CFR Part 17	Endangered and Threatened Wildlife and Plants	Standards for the protection of endangered and threatened wildlife and plants.
50 CFR Part 402	Interagency Cooperation–Endangered Species Act of 1973, as Amended	Interprets and implements the Endangered Species Act of 1973, as amended.
Executive Orders		
Executive Order 11514	*Protection and Enhancement of Environmental Quality*	The federal government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans, and programs so as to meet national environmental goals.
Executive Order 11593	*Protection and Enhancement of the Cultural Environment*	The federal government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation and institute procedures to assure that federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural or archaeological significance.
Executive Order 11988	*Floodplain Management*	Federal agencies shall provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing, and disposing of federal lands and facilities.
Executive Order 11990	*Protection of Wetlands*	Federal agencies shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for acquiring, managing, and disposing of federal lands and facilities.
Executive Order 12088	*Federal Compliance with Pollution Control Standards*	Federal agencies are responsible for compliance with applicable pollution control standards.

Table 6-2. Potentially applicable federal regulations and Executive Orders (page 11 of 11).

Regulation/Order	Title	Subject
Executive Order 12898	*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*	Federal agencies shall make achieving ***environmental justice*** part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on ***minority populations*** and ***low-income populations***.
Executive Order 13007	*Indian Sacred Sites*	In managing federal lands, each executive branch agency with statutory or administrative responsibility for the management of federal lands shall accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.
Executive Order 13112	*Invasive Species*	Federal agencies shall prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.
Executive Order 13132	*Federalism*	Establishes policy to guarantee the division of governmental responsibilities between the national government and the states, and to ensure that the principles of federalism guide the executive departments and agencies in the formulation and implementation of policies.
Executive Order 13175	*Consultation and Coordination with Indian Tribal Governments*	Federal agencies shall establish regular and meaningful consultation and collaboration with Indian tribal governments in the development of regulatory practices on federal matters that significantly or uniquely affect their communities; to reduce the imposition of unfunded mandates upon Indian tribal governments; and to streamline the application process for and increase the availability of waivers to Indian tribal governments.
Executive Order 13186	*Responsibilities of Federal Agencies to Protect Migratory Birds*	The United States recognizes that migratory birds are of great ecological and economic value to this country and to other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of Americans who study, watch, feed, or hunt these birds throughout the United States and other countries. The United States has recognized the critical importance of this shared resource by ratifying international, bilateral conventions for the conservation of migratory birds.
Executive Order 13423	*Strengthening Federal Environmental, Energy, and Transportation Management*	Federal agencies must conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

a. CFR = Code of Federal Regulations.

Table 6-3 lists applicable State of Nevada codes and statutes. Sections 6.3.1 through 6.3.8 are organized by environmental topic and describe the laws, regulations, Executive Orders, State of Nevada codes and statutes, and regulatory actions potentially applicable to construction and operation of the proposed railroad facilities.

Table 6-3. Potentially applicable State of Nevada codes and statutes (page 1 of 3).

Code or statute[a]	Title	Subject
NAC 408	Highways and Roads Installation and Relocation of Facilities and Encroachments	Requirements for design and location, permits, etc.
NAC 444 - Sanitation		
NAC 444.550 through 444.566	Labor Camps	Standards for living and sleeping quarters; cooking and eating, sanitary, and laundry facilities; lighting; and operating permits
NAC 444.8618	Disposal of Hazardous Waste Hazardous Waste Generator Identification Number	Information concerning an application for EPA identification number
NAC 444.850 through 444.8746	Disposal of Hazardous Waste	Standards of practice, variances, and administrative penalties
NAC 445A	Water Controls	Permits, certification of laboratories to analyze substances in water, water pollution control, public water systems, and underground injection control
NAC 445A.226 through 445A.22755	Action Levels for Contaminated Sites	Remediation standards and monitoring requirements for soil, groundwater, and surface-water contamination
NAC 445A.228 through 445A.263	Discharge Permits	Requirements, establishment of effluent limitations, schedules of compliance, inspection, sampling, and monitoring
NAC 445A.266 through 445A.272	General Permits	Requirements for discharge and procedures for application for general permits
NAC 445A.305 through 445A.340	Diffuse Sources	Administration of controls by municipality, determination of new sources of water pollution, state and local handbooks of best management practices, and requirements for permits to construct or grade and forlogging
NAC 445A.345 through 445A.348	Notification of Release of Pollutant	Notice required and use of information in criminal prosecution
NAC 445A.591 through 445A.6731	Drinking Water Systems	Operation of ***community water system*** or nontransient water system; permits to operate privately owned systems; certification of operators; and design, construction, operation, and maintenance
NAC 445A.810 through 445A.925	Underground Injection Control Permits	Permits and construction, operation, monitoring, and abandonment
NAC 445B.001 through 455B.899	Air Pollution Control	Permits, air emissions control program, clean air mercury rule program, and emissions from engines
NAC 445C.010 through 445C.120	Environmental Requirements	Requirements to enter into and contents of an environmental audit agreement
NAC 459	Hazardous Materials	Hazardous materials

Table 6-3. Potentially applicable State of Nevada codes and statutes (page 2 of 3).

Code or statute[a]	Title	Subject
NAC 459.952 through 459.95528	Regulation of Highly Hazardous Substances and Explosives	Requirements, permits, hazard assessments, prevention programs, emergency response programs, and enforcement
NAC 459.975 through 459.991	Transportation of Hazardous Materials on Public Highways	Transportation of hazardous materials on public highways permits
NAC 459.9912 through 459.99184	Planning for and Responding to Discharge of Hazardous Materials	Emergency planning funding for local emergency planning committees, funding for state agencies, and payment of fees
NAC 459.9921 through 459.999	Storage Tanks	Storage tank requirements, registration, monitoring, and corrective action
NAC 472	State Forester Firewarden	Fire retardant roofing materials
NAC 477.010 and 477.290	State Fire Marshal – General Provisions	Definitions and severability
NAC 477.323	Permit to Store Hazardous Material	Permit required; issuance, expiration, renewal, suspension, reinstatement and revocation of permit; fees; criminal investigation; plan for termination
NAC 477.710	Use of Explosives in Blasting	Certificate required; qualifications; exemptions; renewal of certificate; fees
NAC 477.920	Miscellaneous Requirements	Fire suppression systems in buildings in rural areas
NAC 503	Hunting, Fishing, and Trapping Miscellaneous Protective Measures	Classification and taking of wildlife; possession, transportation, importation, exportation, and release of wildlife; hunting and trapping generally; raptors; fishing; depredation; and dredging permits
NAC 504.520	Alteration of a Stream System or Watershed	Approval of Department required to alter stream system or watershed to detriment of wildlife habitat; application for approval
NAC 527	Protection and Preservation of Timbered Lands, Trees, and Flora	Nevada Natural Heritage Program, permits, compliance with plan, revocation of permit, and protection of cacti and yucca
NAC 534	Underground Water and Wells	License to drill well; duties of well drillers; drilling, construction, and plugging of wells and boreholes; waivers; and enforcement
NAC 555	Control of Insects, Pests, and Noxious Weeds	Classification of weeds, weed control districts, regulation of nurseries and nursery stock, custom application of pesticides, certified applicators, and rodent control districts
NAC 586.018	Pesticides	Restricted-use pesticides: Application by or under supervision of certified applicator
NAC 703	Public Utilities Commission of Nevada	Application for privileges, rights, and authority and practice before the public utilities commission
NAC 705	Railroads	Standards and requirements for health and safety and transportation of hazardous materials by rail
NRS 408	Highways, Roads, and Transportation Facilities	Planning; financing highways and roads; improvement of county roads; state highway system; and construction, improvement, and maintenance of highways
NRS 444.130 through 444.200	Sanitation/Construction and Labor Camps	Requirements for conditions

Table 6-3. Potentially applicable State of Nevada codes and statutes (page 3 of 3).

Code or statute[a]	Title	Subject
NRS 444.440 through 444.620	Collection and Disposal of Solid Waste	Collection and disposal of solid waste
NRS 444.570 through 444.650	Disposal of Solid Waste	Disposal of solid waste and sewage
NRS 445A	Water Controls	Concentration of fluoride in water, water pollution control, and public water systems
NRS 445B	Air Pollution	State environmental commission, local hearing board, provisions for enforcement, program for control of air pollution, penalties, and control of emissions from engines
NRS 459.400 through 459.600	Disposal of Hazardous Waste	Disposal of hazardous waste
NRS 533.324 through 533.455	Appropriation of Public Waters: Applications, Permits and Certificates	Environmental permits and transfer of water from county of origin to another county
NRS 704	Regulation of Public Utilities Generally	Rates and schedules, general standards and practices, etc.
NRS 705	Railroads and Monorails	Railroads and monorails

a. NAC = Nevada Administrative Code; NRS = Nevada Revised Statutes.

6.3.1 NATIONAL ENVIRONMENTAL POLICY ACT, AS AMENDED (42 U.S.C. 4321 *et seq.*)

The National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*), requires federal agencies to integrate environmental values into their decision-making process by considering the environmental impacts of proposed federal actions and reasonable ***alternatives*** to those actions. The Act establishes policy, sets goals (in Section 101), and provides means (in Section 102) for carrying out the policy. Section 102(2) contains action-forcing provisions to ensure that federal agencies follow the letter and spirit of the Act. For major federal actions significantly affecting the quality of the human ***environment***, Section 102(2)(C) of NEPA requires federal agencies to prepare a detailed statement that includes the environmental impacts of the proposed action and other specified information. DOE promulgated regulations (10 CFR Part 1021) and issued DOE Order 451.1B, National Environmental Policy Act Compliance Program, to ensure compliance with Section 102(2) of NEPA.

DOE would construct and operate the proposed railroad in compliance with NEPA and promulgated DOE regulations.

6.3.2 HAZARDOUS MATERIALS PACKAGING, HANDLING, AND TRANSPORTATION (49 CFR PARTS 172 AND 173; 10 CFR PARTS 71 AND 73)

The ***shipment*** of ***nuclear waste*** is highly regulated and subject to the utmost scrutiny. DOE follows the strict U.S. Department of Transportation and U.S. Nuclear Regulatory Commission transportation rules, including the use of Commission-certified transportation casks, advance route approvals and notification, and shipment escorts. The Department also tracks its shipments by satellite 24 hours a day. DOE follows these precautions carefully now and will follow any others that might be required in the future, whether by the U.S. Congress, the Department of Transportation, or the Nuclear Regulatory Commission.

In addition, the Department would follow DOE Order 460.1B, which establishes safety requirements for the proper packaging and transportation of DOE/National Nuclear Security Administration offsite shipments and onsite transfers of hazardous materials and for modal transport.

The Department of Transportation is responsible for developing and implementing transportation-safety standards for hazardous materials, including radioactive materials. The Department of Transportation has established standards and requirements for packaging, transporting, and handling radioactive materials for all modes of transportation (49 CFR Parts 172 and 173). The regulations also specify safety requirements for vehicles and transportation operations, training for personnel who perform handling and transportation of hazardous materials, and liability insurance requirements for carriers. For all spent nuclear fuel and high-level radioactive waste shipments, DOE would comply with the requirements for identification, labeling, packaging, marking, placarding, and preparation of shipping papers set forth by the Department of Transportation in 49 CFR Parts 172 and 173.

The Nuclear Regulatory Commission regulates the packaging- and transportation-related operations of its licensees, including commercial shippers of radioactive materials. It sets design and performance standards for packaging (***shipping casks***) that contain materials with high levels of ***radioactivity***.

The Department of Transportation, by agreement with the Nuclear Regulatory Commission, accepts the Commission standards of 10 CFR Part 71 for packaging. The Commission also establishes safeguards and security regulations to minimize the possibility of theft, diversion, or attack on shipments of radioactive materials (10 CFR Part 73). Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local governments and American Indian tribes through whose jurisdictions DOE plans to transport spent nuclear fuel or high-level radioactive waste.

6.3.2.1 Hazardous Materials Transportation Act, as Amended (49 U.S.C. 1801)

The Hazardous Materials Transportation Act of 1975, as amended (49 U.S.C. 1801), gives the U.S. Department of Transportation authority to regulate the transport of hazardous materials, including radioactive materials. Under these regulations, the Department of Transportation regulates the interstate and intrastate shipment of hazardous materials, including spent nuclear fuel and high-level radioactive waste, by land, air, and navigable water. As outlined in a 1979 memorandum of understanding with the U.S. Nuclear Regulatory Commission (44 *FR* 38690, July 2, 1979), the Department of Transportation specifically regulates carriers of spent nuclear fuel and the conditions of transport such as routing, handling, storage, and vehicle and driver requirements. It also regulates the labeling, classification, and marking of transportation packages for radioactive materials.

Department of Transportation regulations include requirements for carriers, drivers, vehicles, routing, packaging, labeling, marking, placarding of vehicles, shipping papers, training, and emergency response. The requirements specify the maximum ***dose rate*** associated with radioactive material shipments and the maximum allowable levels of radioactive surface ***contamination*** on packages and vehicles. Department of Transportation regulations also include requirements to protect the health and safety of transportation workers.

6.3.2.2 Low-Level Radioactive Waste Policy Act, as Amended (42 U.S.C. 2021b *et seq.*)

In 1980 Congress passed the Low-Level Radioactive Waste Policy Act to establish federal policy on nuclear waste disposal, the foundation of which is the idea that the states are responsible for the disposal of ***low-level radioactive waste*** generated within their borders (except for certain federal waste). The desire to restrict access to disposal facilities was a driving force behind the adoption of the 1980 Act and the subsequent Low-Level Radioactive Waste Policy Act of 1985, as amended (42 U.S.C. 2021b *et seq.*).

The 1985 amendments clarified the right of Congressionally approved compacts to control access to their disposal facilities. This Act gives states the responsibility to dispose of low-level radioactive waste generated within their borders and allows them to form compacts to establish facilities to serve a group of states. The Act provides that the facilities will be regulated by the U.S. Nuclear Regulatory Commission or by states that have entered into agreements with the Commission under Section 274 of the Atomic Energy Act. The Act also requires the Commission to establish standards for determining when ***radionuclides*** are present in waste streams in sufficiently low concentrations or quantities as to be "below regulatory concern." Whereas Congress maintains authority over the disposal of high-level nuclear waste and ***transuranic waste***, states are responsible for low-level radioactive waste, which, unlike spent nuclear reactor fuel or high-level radioactive waste, emits a low level of radiation that decays fairly rapidly. Most low-level radioactive waste (97 percent) does not require special ***shielding*** during handling or transportation for the protection of workers or the surrounding community, and it can include such things as contaminated clothing, tools, or equipment.

6.3.2.3 U.S. Nuclear Regulatory Commission Radioactive Material Packaging and Transportation (10 CFR Parts 71 and 73)

Pursuant to 10 CFR Part 71, the U.S. Nuclear Regulatory Commission regulates the packaging and transport of spent nuclear fuel for its licensees, including commercial shippers of radioactive material and the DOE Office of Civilian Radioactive Waste Management. Under an agreement with the Department of Transportation, the Commission sets standards for packaging of radioactive materials, including spent nuclear fuel and high-level radioactive waste. These wastes must meet Type B packaging standards, which require that packages be designed and built to retain their radioactive contents in both normal and accident conditions.

The demonstration of compliance with these requirements applies a combination of calculation methods, computer modeling techniques, and physical testing to the design features of the package. DOE would present the results of the analyses and tests to the Nuclear Regulatory Commission in a safety analysis report for packaging. The Commission would review the safety analysis report, and if approved, would then issue a certificate of compliance to allow spent nuclear fuel or high-level radioactive waste to be shipped to the repository.

The regulations at 10 CFR Part 73 govern safeguards and physical security during the transit of shipments of spent nuclear fuel and specify requirements for carrier personnel, communications, notification of state governors, escorts, and route planning for such shipments. DOE carefully follows the Department of Transportation and the Nuclear Regulatory Commission transportation rules and will follow or exceed any others that may be established in the future, whether by the U.S. Congress, the Department of Transportation, or the Nuclear Regulatory Commission.

6.3.2.4 Emergency Planning and Community Right-to-Know Act (42 U.S.C. 1001 *et seq.*)

Under Subtitle A of the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. 1001 *et seq.*), which is also known as the Superfund Amendments and Reauthorization Act, Title III, federal agencies must provide information on hazardous and toxic chemicals to state emergency response commissions, local emergency planning committees, and the U.S. Environmental Protection Agency. The goal of providing this information about inventories of specific chemicals used or stored, and descriptions of releases that could occur at work sites, is to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances. The Emergency Planning and Community Right-to-Know Act, codified at 40 CFR Parts 302 through 372, requires agencies to provide reports on material safety data sheets, emergency and ***hazardous chemical*** inventory, and toxic chemical releases to appropriate local, state, and federal agencies. These regulations also require facilities that store, dispense, use, or handle extremely hazardous materials in excess of specified thresholds, to report quantity data to specific agencies and organizations. Nevada Administrative Code, Chapters 459 and 477, establish the permitting requirements for highly hazardous substances and hazardous materials, respectively.

6.3.3 AIR QUALITY

6.3.3.1 Clean Air Act, as Amended (42 U.S.C. 7401 *et seq.*)

The Clean Air Act of 1970, as amended (42 U.S.C. 7401 *et seq.*), is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." The Act requires:

- Federal agencies with jurisdiction over any property or endeavor that might result in the discharge of air pollutants to comply with "all federal, state, interstate, and local requirements" related to the control and abatement of air pollution in accordance with 42 U.S.C. 7401, Section 118.
- The Environmental Protection Agency to establish national ***ambient air quality standards*** to protect public health from any known or anticipated adverse effects of a regulated pollutant (42 U.S.C. 7409).
- The Environmental Protection Agency to establish national standards of performance for new or modified stationary sources of atmospheric pollutants (42 U.S.C. 7411) and the evaluation of specific emission increases to prevent a significant deterioration in ***air quality*** (42 U.S.C. 7470).

6.3.3.2 National Primary and Secondary Ambient Air Quality Standards (40 CFR Part 50)

Under the Clean Air Act, the Environmental Protection Agency has established national ***ambient air*** quality standards at 40 CFR Part 50 to protect the public health and the environment. The national ambient air quality standards identify six pollutant types as criteria pollutants: ***nitrogen dioxide***, ***ozone***, lead, ***carbon monoxide***, ***particulate matter***, and ***sulfur dioxide***. The Environmental Protection Agency calls these "criteria" air pollutants because it regulates them from the development of human health-based and/or environmentally based criteria (science-based guidelines) in setting permissible levels.

The Clean Air Act specifically regulates emissions of hazardous air pollutants, including radionuclides, through the national emission standards for ***hazardous air pollutants*** program (40 CFR Parts 61 and 63).

6.3.3.3 Nevada Revised Statutes: Air Pollution (Title 40, Chapter 445B)

Nevada Revised Statutes, Chapter 445B, Air Pollution, and regulations in the Nevada Administrative Code implement state and federal Clean Air Act provisions, identify the requirements for permits for each air pollution source unless it is specifically exempted, and identify ongoing monitoring requirements. DOE would need operating permits from the Nevada Division of Environmental Protection, Bureau of Air Pollution Control, for the control of gaseous and particulate emissions from construction and operation of the proposed railroad.

6.3.4 WATER QUALITY

6.3.4.1 Clean Water Act, as Amended (33 U.S.C. 1251 *et seq.*)

The Clean Water Act regulates the discharge of pollutants into the Nation's surface waters, including lakes, rivers, streams, ***wetlands***, and coastal areas. Passed in 1972 and amended in 1977 and 1987, the Clean Water Act was originally known as the Federal Water Pollution Control Act. The Clean Water Act is administered by the U.S. Environmental Protection Agency, which sets water quality standards, handles enforcement, and helps state and local governments develop their own pollution control plans. The purpose of the Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*) is to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." The U.S. Environmental Protection Agency delegated the State of Nevada the authority to implement and enforce most programs in the state under the Clean Water Act; exceptions include those addressed by Section 404 of the Act, which is administered by the U.S. Army Corps of Engineers, and described in this section.

This Act prohibits the "discharge of toxic pollutants in toxic amounts" to navigable ***waters of the United States***. Section 313 of the Act requires all departments and agencies of the Federal Government engaged in any activity that might result in a discharge or runoff of pollutants to surface waters to comply with federal, state, interstate, and local requirements. The Act applies to activities at and along the Caliente ***rail alignment*** and the Mina rail alignment that could affect waterways. Under the Clean Water Act, the State of Nevada sets water quality standards, and the U.S. Environmental Protection Agency and the State of Nevada regulate and issue permits for point-source discharges as part of the National Pollutant Discharge Elimination System permitting program. The Environmental Protection Agency regulations for this program are codified at 40 CFR Part 122, and Nevada rules for this program are codified at Nevada Administrative Code, Chapter 445A. If construction or operation of the proposed railroad in Nevada would result in point-source discharges, DOE would need to obtain a National Pollutant Discharge Elimination System permit from the Nevada Division of Environmental Protection, Bureau of Water Pollution Control.

Section 402(p) of the Clean Water Act requires the Environmental Protection Agency to establish regulations and requires individual states to issue permits for stormwater discharges associated with industrial activity, including construction activities that could disturb 20,000 or more square meters (5 or more acres) (40 CFR Part 122). Stormwater discharge permits are designed to control the degradation of surface water and ***groundwater*** primarily from erosion and sedimentation. Nevada rules for this program are codified at Nevada Administrative Code, Chapter 445A. Stormwater permits issued from the Nevada Bureau of Water Pollution Control regulate the discharge of stormwater from facilities. The Proposed Action includes rail line ***construction and operations support facilities*** that would have discharges of stormwater. DOE would need to obtain permits for these discharges. Additionally, construction and operation of septic and sanitary-sewage collection systems would require permits from the Nevada Bureau of Water Pollution Control.

Jurisdictional waters of the United States are subject to regulation by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. Jurisdictional waters of the United States include navigable and interstate waters, intrastate waters with a connection to interstate commerce and tributaries to such waters, and wetlands that are adjacent to waters of the United States. Section 404 of the Clean Water Act established a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Construction activities, such as those for the proposed railroad, that would impact waters of the United States are regulated under this program.

The basic premise of the Section 404 permitting program is that no discharge of dredged or fill material into jurisdictional waters will be permitted if a practicable alternative exists that is less damaging to the aquatic environment, or the Nation's waters would be significantly degraded. In other words, it must be demonstrated that, to the extent practicable, steps have been taken to avoid impacts and that potential impacts on jurisdictional waters have been minimized and compensation is provided for any remaining unavoidable impacts (if required). Proposed activities are regulated through a permit review process.

An evaluation under Section 404(b)(1) of the Clean Water Act would analyze and describe the potential impacts from any proposed discharges of dredged or fill material into jurisdictional waters that would result from construction and operation of the proposed railroad. To complete the 404(b)(1) analysis, DOE would be required to identify the appropriate and applicable steps that would be taken during construction to minimize potential adverse impacts. These steps would include actions taken to reduce the potential for increased erosion and subsequent sedimentation and to ensure that any downstream water would not experience increases in sediment loading or turbidity that would threaten the beneficial use of that stream.

Section 404(r) of the Clean Water Act states that the discharge of dredged or fill material as part of the construction of a federal project specifically authorized by Congress is not prohibited or subject to regulation under Section 404 of the Clean Water Act so long as certain conditions are met. One of those conditions is to publish in an EIS information on the effects of such discharge, including an analysis of alternatives as required by Section 404(b)(1) of the Clean Water Act. If DOE determines that it will comply with Section 404(r), an alternatives analysis that meets the requirements of Sections 404(b)(1) and 404(r) will be published in the Final EIS. Otherwise, DOE would apply to the U.S. Army Corps of Engineers for a permit to fill jurisdictional waters of the United States.

Sections 401 and 405 of the Water Quality Act of 1987 and Public Law 100-4 added Section 402(p) to the Clean Water Act. Section 401 provides states with the opportunity to review and approve, condition, or deny all federal permits or licenses that might result in a discharge to state or tribal waters, including wetlands. The major federal permit subject to Section 401 review is a Section 404 permit. Every applicant for a Section 404 permit must request state certification that the proposed activity will not violate state or federal water quality standards. Construction of the proposed railroad would require the discharge of dredged or fill materials for bridges and culverts into United States waters via interstate streams and dry ***washes***. DOE would follow the requirements of Section 401 in requesting state certification. The proposed construction activities would not exceed State of Nevada water quality standards or otherwise violate a state requirement.

6.3.4.2 Safe Drinking Water Act, as Amended (42 U.S.C. 300 *et seq.*)

The Safe Drinking Water Act of 1974, as amended (42 U.S.C. 300(f) *et seq.*), gives the U.S. Environmental Protection Agency the responsibility and authority to regulate public drinking-water supplies by establishing drinking-water standards, delegating authority for enforcement of drinking-water standards to the states, and protecting ***aquifers*** from pollution hazards. The Nevada Division of Environmental Protection, Bureau of Safe Drinking Water, is the state agency responsible for enforcement. Environmental Protection Agency regulations for this program are codified at 40 CFR Part 141, and Nevada rules for this program are codified at Nevada Administrative Code, Chapter 445A. Operating permits are required for public water distribution systems, which are classified as a public water supply if each serves 15 connections or 25 people for more than 60 days per year. Because public water distribution systems would be located along the rail line at ***construction camps*** and railroad operations support facilities, DOE would have to obtain operating permits for these systems.

6.3.4.3 Nevada Revised Statutes: Water Controls (Title 40, Chapter 445A)

Nevada Revised Statutes, Chapter 445A, Water Controls, classifies the waters of the state, establishes standards for the quality of all waters in the state, and specifies permit and notification provisions for stormwater discharges and for other discharges to the waters of the state according to provisions of the Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*) and the Safe Drinking Water Act of 1974 (42 U.S.C. 300 *et seq.*). These statutes and regulations in the Nevada Administrative Code set drinking water standards, specifications for certification, and conditions for issuance of variance and exemptions; set standards and requirements for the construction of wells and other water-supply systems; establish the different classes of wells and aquifer exemptions; and establish requirements for well operation and monitoring, plugging, and abandonment activities.

Additionally, the Nevada Division of Environmental Protection, Bureau of Water Pollution Control, requires a temporary permit to work in waterways of the state (that is, a rolling stock permit) before using equipment in waters of the state, including dry washes, that could directly discharge pollutants into waters of the state. Construction of the rail line would require installation of drainage ***culverts*** or bridges to cross some of the washes and streambeds and other construction activities in channels. DOE would have to obtain a permit for such work.

6.3.4.4 Nevada Revised Statutes: Adjudication of Vested Water Rights, Appropriation of Public Waters; Underground Water and Wells (Title 48, Chapters 533 and 534)

Nevada Revised Statutes, Chapters 533 and 534, and accompanying regulations in the Nevada Administrative Code, Chapters 533 and 534, establish permitting procedures for appropriating public waters of the state, including underground waters for beneficial use. The withdrawal of underground water in Nevada requires a permit from the Nevada State Engineer. DOE intends to meet water needs through construction of new wells and would need to apply for water rights with the Nevada State Engineer for construction of wells along the proposed rail alignment.

6.3.4.5 Floodplain Management and Protection of Wetlands (Executive Orders 11988 and 11990)

Executive Order 11988 requires federal agencies to ensure that the agency evaluates the potential effects of any proposed action on ***floodplains***; to ensure that planning programs and budget requests reflect consideration of flood hazards and floodplain management; and to prescribe procedures to implement the policies and requirements of the Order. Federal agencies are required to reduce risk of flood damage; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains.

Executive Order 11990 requires that federal agencies "...take action to minimize the destruction, loss, or degradation of wetlands," and to consider wetland protection in decision making. It should be noted that exclusion of isolated (nonjurisdictional) wetlands is not indicated in the Executive Order.

DOE issued regulations that implement these Executive Orders (10 CFR Part 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements). In accordance with this regulation, specifically 10 CFR 1022.11(d), DOE must prepare a floodplain assessment for proposed actions that would take place in floodplains and a wetlands assessment for proposed actions that would take place in wetlands. DOE must also avoid to the extent possible the long- and short-term adverse impacts associated with the destruction of wetlands and the occupancy and modification of floodplains and wetlands, and avoid direct and indirect support of floodplain and wetlands development wherever there is a practicable alternative.

To meet the requirements of 10 CFR Part 1022, Appendix F, Floodplain and Wetlands Assessment, includes a detailed analysis of floodplains and wetlands within the Caliente and Mina rail alignments regions of influence.

6.3.5 POLLUTION PREVENTION AND CONTROL

6.3.5.1 Pollution Prevention Act (42 U.S.C. 13101 *et seq.*)

The Pollution Prevention Act of 1990 (42 U.S.C. 13101 *et seq.*) establishes a national policy for waste management and pollution control that focuses first on source reduction, and then on environmentally safe waste recycling, treatment, and disposal. Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management,* directs federal agencies to implement sustainable practices for pollution and waste prevention and recycling.

6.3.5.2 Comprehensive Environmental Response, Compensation, and Liability Act, as Amended (42 U.S.C. 9601 *et seq.*)

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act (42 U.S.C. 9601 *et seq.*), authorizes the U.S. Environmental Protection Agency to require responsible site owners, operators, arrangers, and transporters to clean up releases of hazardous substances, including certain radioactive substances. Under this Act, the Environmental Protection Agency has the authority to regulate hazardous substances at rail line construction zones in the event of a release or a "substantial threat of a release." DOE would report any releases greater than reportable quantities of hazardous substances (as codified in 40 CFR Part 302 under the Comprehensive Environmental Response, Compensation, and Liability Act) to the National Response Center, extremely hazardous substances (as codified in 40 CFR Part 355 under the Emergency Planning and Community Right-to-Know Act) to the State Emergency Response Commission contacts for Nevada, and substances classified as both hazardous and extremely hazardous to both the National Response Center and the State Emergency Response Commission contacts for Nevada. Nevada Administrative Code, Sections 445A.226 through 445A.22755, provide action levels for contaminated sites, including levels for groundwater, surface water, and soil. In the event of a release of hazardous substances during construction and operation of the proposed railroad, DOE would clean up releases in a manner that complies with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended.

6.3.5.3 Resource Conservation and Recovery Act, as Amended (42 U.S.C. 6901 *et seq.*)

The treatment, storage, and disposal of hazardous and nonhazardous waste is regulated by the provisions of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 and the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 *et seq.*), and applicable state laws. Environmental Protection Agency regulations implementing the ***hazardous waste*** portions of the Resource Conservation and Recovery Act define hazardous wastes and specify requirements for their transportation, handling, treatment, storage, and disposal (40 CFR Parts 260 through 272). Immediate response actions and cleanup of spills are specified in 40 CFR Part 263.

Subtitle C of the Resource Conservation and Recovery Act requires that Resource Conservation and Recovery Act hazardous wastes be characterized and managed. DOE would track the amount of hazardous wastes that would be generated each month during proposed railroad construction and operations, including a log of materials and weight of all generated hazardous wastes. DOE would monitor waste-generator status and would comply in accordance with the applicable Subtitle C regulations. Nevada Administrative Code, Sections 444.850 to 444.8746, are the governing requirements for wastes generated under Subtitle C.

Subtitle D of the Resource Conservation and Recovery Act sets forth definitions, methods of disposal, and special requirements for solid-waste collection, transportation standards; and classification of landfills. Subtitle D focuses on state and local governments as the primary planning, regulating, and implementing entities for the management of nonhazardous solid waste, such as household garbage and nonhazardous industrial solid waste. The governing requirements for wastes generated in Nevada under Subtitle D are Nevada Revised Statutes, Sections 444.440 to 444.620, and Nevada Administrative Code, Sections 444.570 to 444.7499. DOE plans to dispose of solid waste from railroad construction and operations at commercial or municipal landfill facilities that meet Subtitle D requirements.

6.3.5.4 Federal Insecticide, Fungicide, and Rodenticide Act, as Amended (7 U.S.C. 136 *et seq.*)

The primary focus of the Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended (7 U.S.C. 136 *et seq.*), and the Act's implementing regulations (40 CFR Parts 152 through 186), is to provide federal control of pesticide distribution, sale, and use. The Nevada Pesticides Act, Nevada Administrative Code, Chapter 586, and Nevada Revised Statutes, Sections 586.010 through 586.450, also regulate pesticide distribution and use, and require registration with the state. DOE would comply with federal and state laws in the application and storage of pesticides during construction and operation of the proposed railroad.

6.3.5.5 Noise Control Act, as Amended (42 U.S.C. 4901 *et seq.*)

Section 4 of the Noise Control Act of 1972, as amended (42 U.S.C. 4901 *et seq.*), directs federal agencies to carry out programs in their jurisdictions "to the fullest extent within their authority" and in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare. This law provides requirements related to noise that would be generated by construction and operations activities associated with the proposed railroad. The STB, a cooperating agency on this Rail Alignment EIS, has environmental review regulations for noise analysis (49 CFR 1105.7e(6)) with the following criteria:

- An increase in noise exposure as measured by day-night average noise level of 3 ***A-weighted decibels*** or more.
- An increase to a noise level of 65 A-weighted decibels ***day-night average noise level*** or greater.

DOE used these environmental review regulations to analyze potential train noise for this Rail Alignment EIS.

6.3.5.6 Strengthening Federal Environmental, Energy, and Transportation Management (Executive Order 13423)

Executive Order 13423 sets goals for federal agencies in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, renewable energy, sustainable buildings, electronics stewardship, fleets, and water conservation. In addition, this Order requires more widespread use of Environmental Management Systems as the framework in which to manager and continually improve these sustainable practices. DOE would comply with the provisions of this Order during construction and operation of the proposed railroad.

6.3.6 CULTURAL RESOURCES

To meet federal historic preservation laws and regulations and NEPA (40 CFR 1500 through 1508) mandates, DOE would identify and evaluate all cultural resources in the regions of influence along the Caliente rail alignment and the Mina rail alignment, including prehistoric, historic, and American Indian, and assess the potential for adverse impacts during construction and operation of the proposed railroad. The National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*), is the primary source of regulatory requirements for the protection of cultural resources (see Section 6.3.6.1). Sections 6.3.6.2 through 6.3.6.8 describe other sources of regulatory requirements.

6.3.6.1 National Historic Preservation, as Amended (16 U.S.C. 470 *et seq.*)

The National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*), provides for the placement of sites with significant national historic value on the *National Register of Historic Places*. It requires no permits or certifications. In this Rail Alignment EIS, DOE evaluated proposed railroad construction activities that could have a potential effect on historic resources pursuant to a programmatic agreement with the BLM, the STB, and the Nevada State Historic Preservation Office (DIRS 176912-Wenker et al. 2006, all). The programmatic agreement provides that, prior to commencement of any ground-disturbing construction activities, an appropriate level of field investigation including on-the-ground intensive surveys, evaluations of all recorded resources on the *National Register of Historic Places*, assessments of adverse effects, and applicable ***mitigation*** of identified impacts be completed. The BLM manages most of the land over which DOE would construct the proposed railroad; therefore, relevant provisions of the programmatic agreement would apply. Additionally, in cooperation with the BLM and the STB, the programmatic agreement requires DOE to make a good faith effort to consult with tribes and identify affected ethnic groups, to identify properties of traditional religious and cultural importance, inform the consulting parties of the eligibility of properties for listing on the *National Register of Historic Places*, and suggest appropriate treatment to avoid adverse impacts to historic properties. Appendix B of this Rail Alignment EIS describes the consultation process.

6.3.6.2 American Antiquities Act (16 U.S.C. 431 *et seq.*)

The American Antiquities Act of 1906 (16 U.S.C. 431 *et seq.*) protects historic and prehistoric ruins, monuments, and objects of antiquity including vertebrate paleontological resources, on federally owned or controlled lands. If historic or prehistoric ruins or objects were found during construction of the proposed railroad, DOE would follow provisions of this Act to minimize or mitigate adverse effects.

6.3.6.3 Archaeological Resources Protection Act, as Amended (16 U.S.C. 470aa *et seq.*)

The Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470aa *et seq.*), requires a permit for excavation or removal of archaeological resources from publicly held or American Indian lands. The Act requires that excavations further archaeological knowledge in the public interest, and that the resources removed remain the property of the United States. Requirements of this Act would apply to any proposed excavation activity that resulted in identification of archaeological resources.

6.3.6.4 Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq.*)

The Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*) directs the Secretary of the Interior to guide the repatriation of federal archaeological collections and collections that are culturally affiliated with American Indian tribes and held by museums that receive federal funding. Actions required by this law include establishing a review committee with monitoring and policy-making responsibilities, developing regulations for repatriation, including procedures for identifying lineal descent or cultural affiliation needed for claims, overseeing museum programs designed to meet the inventory requirements and deadlines of this law, and developing procedures to handle unexpected discoveries of graves or grave artifacts during activities on federal or tribal land. DOE would follow the provisions of this Act if any excavations associated with the proposed railroad construction led to unexpected discoveries of American Indian graves or grave artifacts.

6.3.6.5 American Indian Religious Freedom Act (42 U.S.C. 1996)

The American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) reaffirms American Indian religious freedom under the First Amendment of the U.S. Constitution, and establishes policy to protect and preserve the inherent and Constitutional right of American Indians to believe, express, and exercise their traditional religions. This law ensures the protection of sacred locations and access of American Indians to those sacred locations and traditional resources that are integral to the practice of their religions. It also establishes requirements that would apply to American Indian sacred locations, traditional resources, or traditional religious practices potentially affected by construction and operation of the proposed railroad.

6.3.6.6 Protection and Enhancement of the Cultural Environment (Executive Order 11593)

Executive Order 11593 directs federal executive agencies to locate, catalog, and nominate properties under their jurisdiction or control to the *National Register of Historic Places*. DOE would follow the provisions of this Order during construction of the proposed railroad.

6.3.6.7 Indian Sacred Sites (Executive Order 13007)

Executive Order 13007 directs federal agencies, to the extent permitted by law and not inconsistent with agency missions, to avoid adverse effects to sacred sites and to provide access to those sites to American Indians for religious practices. The Order directs agencies to plan projects in a manner that allows protection of and access to sacred sites to the extent compatible with the project. DOE would follow the provisions of this Order during construction and operation of the proposed railroad.

6.3.6.8 Consultation and Coordination with Indian Tribal Governments (Executive Order 13175)

Executive Order 13175 directs federal agencies to establish regular and meaningful consultation and collaboration with tribal governments in developing federal policies that have tribal implications, to strengthen U.S. government-to-government relationships with American Indian tribes, and to reduce the imposition of unfunded mandates on tribal governments. DOE has and will continue to follow the provisions of this Order during construction and operation of the proposed railroad through regular consultation with the Consolidated Group of Tribes and Organizations, which consists of officially appointed tribal representatives who are responsible for presenting their respective tribal concerns and perspectives to DOE.

6.3.7 BIOLOGICAL RESOURCES

6.3.7.1 Endangered Species Act, as Amended (16 U.S.C. 1531 *et seq.*)

The Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), provides for the conservation of ***threatened*** and ***endangered species*** and the ***ecosystems*** upon which those species rely. If construction or operation of the proposed railroad could affect threatened or endangered species, or their designated critical ***habitat***, DOE would be required to assess the potential impact and develop measures to minimize the impact. If there would be potential adverse impacts to a listed species or designated critical habitat, DOE would be required to consult formally with the U.S. Fish and Wildlife Service in compliance with Section 7 of the Act. As part of the Section 7 consultation, DOE would have to prepare a Biological Assessment and provide it to the Fish and Wildlife Service. The Fish and Wildlife Service would then prepare a Biological Opinion making a determination as to whether the Proposed Action would jeopardize the continued existence of the species under consideration. If the Fish and Wildlife Service rendered a non-jeopardy opinion, but a finding that some individuals could be killed or otherwise harmed incidentally by the Proposed Action, the Fish and Wildlife Service could determine that such losses are not prohibited, so long as measures outlined in a permit to incidentally take a listed species were followed. The permit would include limits on the taking of a listed species and its designated critical habitat and mandatory terms and conditions for minimizing the take. Regulations implementing the applicable interagency consultation process of the Endangered Species Act are codified at 50 CFR Part 402.

If the Fish and Wildlife Service determines that the proposed federal action jeopardizes a listed species or adversely modifies its designated critical habitat, the Secretary of the Interior suggests alternatives to the proposed action that would not violate the action. Then federal agencies must decide whether to modify the project as suggested, abandon it, or file an application for an exemption. Regulations that describe the exemption process are found in 50 CFR Parts 450 through 453.

6.3.7.2 Fish and Wildlife Coordination Act, as Amended (16 U.S.C. 661 *et seq.*)

The Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. 661 *et seq.*), promotes effectual planning and cooperation between federal, state, public, and private agencies for the conservation and rehabilitation of the Nation's fish and wildlife, and authorizes the U.S. Department of the Interior to provide assistance. The Act requires that when a department or agency of the U.S. Government modifies the waters, or channel of a body of water, the department or agency must consult with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the state agency that administers wildlife resources in the affected state. DOE consultation with appropriate federal and State of Nevada agencies regarding construction and operation of the proposed railroad would be in compliance with the requirements of this Act.

6.3.7.3 Migratory Bird Treaty Act, as Amended (16 U.S.C. 703 seq.)

The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 *et seq.*), protects birds that have common migration patterns between the United States, Canada, Mexico, Japan, and Russia. It also regulates the take and harvest of migratory birds. All species of birds found along the proposed rail alignments are protected by the Migratory Bird Treaty Act with the exceptions of European starlings (*Sturnus vulgaris*), rock doves (pigeons; *Columba livia*), and house sparrows (*Passer domesticus*), and any game species having legal harvest seasons set by the Nevada Department of Wildlife. DOE would implement methods during proposed railroad construction and operation, including surveys for nesting birds and restrictions on the timing of construction, to prevent the take of migratory birds.

6.3.7.4 Bald and Golden Eagle Protection Act, as Amended (16 U.S.C. 668 through 668d)

The Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668 through 668d), makes it illegal to take, pursue, molest, or disturb bald eagles (American, *Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), their nests, or their eggs anywhere in the United States (Sections 668 and 668c). The U.S. Department of the Interior regulates activities that might adversely affect bald and golden eagles.

6.3.7.5 The Wild Free-Roaming Horses and Burros Act, as Amended (16 U.S.C. 1331 *et seq.*)

The Wild Free-Roaming Horses and Burros Act of 1971, as amended (16 U.S.C. 1331 *et seq.*), requires the protection, management, and control of wild free-roaming horses and burros on ***public lands***. The Act states that "wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands." DOE would construct and operate the railroad in compliance with the provisions of this Act.

6.3.7.6 National Wildlife Refuge System Administration Act, as Amended (16 U.S.C. 668dd)

The National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd), provides guidelines for the administration and management of lands, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas." If use of lands for the proposed railroad could affect lands in the National Wildlife Refuge System, DOE would consult with the U.S. Fish and Wildlife Service. Regulations implementing the Act are codified at 50 CFR Parts 25 and 27 through 29.

6.3.7.7 Nevada Revised Statutes: Protection and Preservation of Timbered Lands, Trees, and Flora (Title 47, Chapter 527)

Nevada Revised Statutes, Chapter 527, specifies protection of the indigenous flora of the State of Nevada. If the state determines that a species or subspecies of native flora is threatened with extinction, that species or subspecies is to be placed on the state list of fully protected species. No member of the species or subspecies may be taken or destroyed unless an authorized state official issues a special permit.

6.3.7.8 Nevada Revised Statutes: Hunting, Fishing, and Trapping; Miscellaneous Protective Measures (Title 45, Chapter 503)

Nevada Revised Statutes, Chapter 503, Hunting, Fishing, and Trapping, Miscellaneous Protective Measures, and Nevada Administrative Code, Chapter 503, Sections 010 through 104, specify procedures for the classification and protection of wildlife. No member of a species classified as protected may be hunted, taken, or possessed without first obtaining a permit or written authorization from the Nevada Department of Wildlife. Nevada Revised Statute, Chapter 527, Protection and Preservation of Timbered

Lands, Trees, and Flora, also applies to the permit requirement. No protected species would be hunted, taken, or possessed during construction or operation of the proposed railroad.

6.3.7.9 Nevada Revised Statutes: Control of Insects, Pests, and Noxious Weeds (Title 49, Chapter 555)

Nevada Revised Statutes, Chapter 555, Control of Insects, Pests, and Noxious Weeds, specifies the laws by which the Nevada Department of Agriculture designates and regulates ***noxious weeds*** and pests. Clearing vegetation and disturbing the soil during construction would create habitat for colonization by noxious weeds present along the rail line. DOE would minimize such impacts, in compliance with the provisions in this Nevada Statute, by developing and implementing a weed management program, which could include reclamation of disturbed areas that would enhance the recovery of native vegetation and reduce colonization by exotic species.

6.3.7.10 Invasive Species (Executive Order 13112)

Executive Order 13112 directs federal agencies to act to prevent the introduction of, or to monitor and control, nonnative or invasive plant species, to provide for restoration of ***native plant species***, to conduct research, to promote educational activities, and to exercise care in taking actions that could promote the introduction or spread of ***invasive species***. DOE would minimize such impacts, in compliance with the provisions in this Executive Order, by developing and implementing a weed management program.

6.3.7.11 Responsibilities of Federal Agencies to Protect Migratory Birds (Executive Order 13186)

Executive Order 13186 requires federal agencies to avoid or minimize the negative impacts of their actions on migratory birds and to take active steps to protect birds and their habitats. The Order directs each federal agency whose action has, or is likely to have, a negative impact on migratory bird populations to develop an agreement with the U.S. Fish and Wildlife Service to conserve those birds. The Order directs agencies to avoid or minimize the impact on migratory bird populations, to take reasonable steps that include restoring and enhancing bird habitats, to prevent or abate pollution that would affect birds, and to incorporate migratory bird conservation into agency planning processes when possible. The Order also requires environmental analyses of federal actions to evaluate effects of those actions on migratory birds, to control the spread and establishment in the wild of exotic animals and plants that could harm migratory birds and their habitats, and either to provide advance notice of actions that could result in the taking of migratory birds or to report annually to the U.S. Fish and Wildlife Service on the numbers of each species taken during the conduct of agency actions. Section 4.12 of this Rail Alignment EIS, Biological Resources, discusses potential impacts to migratory birds. DOE would implement methods during proposed railroad construction and operation, including surveys for nesting birds and restrictions on the timing of construction, to prevent the take of migratory birds.

6.3.8 LAND USE

Land uses that could be affected by the proposed railroad are under the jurisdiction of federal, state, county, and municipal plans and policies. Lincoln, Nye, and Esmeralda Counties have land-use plans (*Lincoln County Master Plan* [DIRS 174520-State of Nevada 2001, all]; *Adoption of the Nye County Comprehensive Plan* [DIRS 147994-McRae 1994, all]; *Master Plan Esmeralda County, Nevada* [DIRS 176770-Duval et al. 1976, all]). Approximately 99 percent of the lands along the Caliente and Mina rail alignments are BLM-administered public lands. The BLM administers the uses of lands along the Caliente rail alignment through ***resource management plans*** including the *Tonopah Resource Management Plan and Record of Decision* (DIRS 173224-BLM 1997, all), the *Draft Ely Resource*

Management Plan (when it is finalized; DIRS 174518-BLM 2005, all), and the *Record of Decision for the Approved Las Vegas Resource Management Plan and Final Environmental Impact Statement* (DIRS 176043-BLM 1998, all). The BLM administers the uses of lands along the Mina rail alignment through the *Carson City Field Office Consolidated Resource Management Plan* (DIRS 179560-BLM 2001, all), the *Tonopah Resource Management Plan and Record of Decision* (DIRS 173224-BLM 1997, all), and the *Record of Decision for the Approved Las Vegas Resource Management Plan and Final Environmental Impact Statement* (DIRS 176043-BLM 1998, all).

6.3.8.1 Federal Land Policy and Management Act (43 U.S.C. 1701 *et seq.*)

The Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*) established procedures for acquiring access to public lands. The regulations regarding withdrawals of public-domain land from public use, as codified in 43 CFR Part 2300, and the establishment of right-of-way reservations, as codified in 43 CFR Part 2800, primarily govern access to, and use of, BLM-administered lands. Section 6.6 describes this Act.

6.3.8.2 Materials Act (30 U.S.C. 601 *et seq.*)

The Materials Act of 1947 (30 U.S.C. 601 *et seq.*) authorizes land management agencies such as the BLM to make common varieties of sand, stone, and gravel from public lands available to federal and state agencies under a ***free-use permit***. Regulations implementing the Materials Act are codified at 43 CFR Part 3600. To use common varieties of sand, stone, and gravel from public lands during construction of the proposed railroad, DOE would obtain free-use permits from the BLM.

6.3.8.3 Taylor Grazing Act, as Amended (43 U.S.C. 315 *et seq.*)

The Taylor Grazing Act of 1943, as amended (43 U.S.C. 315 *et seq.*), establishes processes by which the BLM grants and administers grazing rights. Regulations implementing the Taylor Grazing Act are codified at 43 CFR Parts 2300 and 4100 and include provisions for the agency to consider in administering grazing rights.

6.3.8.4 Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*)

The Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 *et seq.*) seeks to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion to nonagricultural uses of farmlands with soils that are identified as prime and unique or of statewide and local importance. To comply with this law, DOE has coordinated with the U.S. Department of Agriculture, Natural Resources Conservation Service, to identify ***prime farmlands*** that could be affected by the proposed action and to evaluate impacts to those lands. Regulations implementing the Farmland Protection Policy Act are codified at 7 CFR Part 658.

6.3.8.5 Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4651 *et seq.*)

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4651 *et seq.*) encourages and expedites the acquisition of real property by agreements with owners; avoids litigation, including condemnation actions where possible, and relieves congestion in the courts; provides for consistent treatment of owners; and promotes public confidence in federal land-acquisition practices. For those portions of the rail line that would cross private land, DOE could negotiate a long-term lease with the landowner or transfer the land to federal ownership in accordance with this Act.

6.3.8.6 General Mining Law, as Amended (30 U.S.C. 22 through 54)

The Mining Law of 1872, as amended (30 U.S.C. 29; 43 CFR 3860) (30 U.S.C. 22 through 54), was one of a number of public land laws passed by Congress in the late 1800s to encourage settlement, development, and private ownership of the public-domain lands in the western United States. The Mining Law of 1872 enables public citizens and the mining industry the right to claim, settle on, develop mineral resources, and acquire title to public lands administered by the BLM and the U.S. Forest Service (an agency of the U.S. Department of Agriculture).

The Mining Law Administration program managed by the BLM involves primarily the last three elements: recordation, maintenance (annual work/surface management), and mineral patents. Surface management on National Forest System lands is administered by the Forest Service.

6.3.9 CONSTRUCTION- AND OPERATIONS-RELATED STATUTES AND REGULATIONS

6.3.9.1 Communications Act, as Amended (47 U.S.C. 308 *et seq.*)

The Communications Act of 1934, as amended by the Telecommunications Act of 1996 (47 U.S.C. 308 *et seq.*), and regulations of the Federal Communications Commission require an agency to obtain Federal Communications Commission permission to construct a private broadcasting system. DOE would need to obtain permission to use an assigned frequency, and the Federal Communications Commission would have to approve the design and location of the system prior to construction. The communication system for the proposed railroad would consist of a fiber optic cable along the length of the line with broadcasting antenna located within the ***operations right-of-way*** at sufficient intervals to allow complete coverage of train-to-dispatch radio communications. DOE would obtain Federal Communications Commission approval to construct and operate this radio system and install a fiber optics line.

6.3.9.2 Construction Camp Permits (Title 40, Chapter 444.130; NAC 444.550 through 444.566)

The Nevada State Health Division specifies conditions and requires permits for construction and labor camps in Nevada (Nevada Revised Statutes, Chapter 444.130 *et seq.*, and Nevada Administration Code, Chapters 444.550 through 444.566). These statutes and regulations are designed to maintain sanitary and healthy conditions at construction and labor camps in Nevada. They would apply to the design and operation of construction camps that DOE would establish during construction of the proposed railroad.

6.3.9.3 Occupancy Permits to Cross State Highways

The Nevada Department of Transportation and the Nevada Public Utilities Commission regulate rail crossings of public highways. The Nevada Department of Transportation requires an occupancy permit to place a facility (including a railway) within a right-of-way of a state highway (Nevada Administrative Code, Section 408.427). The Public Utilities Commission must approve the placement of railroad tracks across public highways prior to construction of the tracks (Nevada Administrative Code, Section 703.455). DOE would have to obtain similar approvals for construction of access roads, water pipelines, and other ***infrastructure*** that would intersect highway rights-of-way.

The STB would regulate the proposed railroad if DOE implemented the Shared-Use Option. In this case, the Federal Railroad Safety Act of 1970, as amended (49 U.S.C. 20106 *et seq.*), could preempt Nevada regulations related to railroad safety. However, DOE would still design and construct highway crossings to address the concerns of Nevada regulatory agencies.

6.4 U.S. Department of Energy Orders

Under the authority of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 through 2259), DOE is responsible for establishing a comprehensive health, safety, and environmental program for its activities and facilities. DOE has established a framework for managing its facilities through the promulgation of regulations and the issuance of DOE Orders that set forth policies, programs, and procedures for implementing activities. DOE Orders are a component of DOE Directives that also include Policies, Notices, Manuals, and Guides, all of which are intended to direct, guide, inform, and instruct employees in the performance of their jobs, and enable them to work effectively within the Department and with agencies, contractors, and the public. Table 6-4 lists DOE Orders that could be relevant to construction and operation of the proposed railroad.

Table 6-4. Potentially applicable DOE Orders (page 1 of 2).

Order number and date of last revision	Subject	Description[a]
151.1C 11/02/05	Comprehensive Emergency Management System	Establishes requirements for emergency planning, preparedness, response, recovery, and readiness assurance activities and describes the approach for effectively integrating these activities under a comprehensive, all-emergency concept.
231.1A 06/03/04	Environment, Safety, and Health Reporting	Establishes the requirements procedures for information with environmental protection, safety, or protection significance for DOE operations.
252.1 11/19/99	Technical Standards	Requires that appropriate voluntary consensus standards (codes and standards) be selected, used, and adhered to for the design, testing, etc., of the proposed railroad.
413.3 07/28/06	Project Management	Demonstrates that DOE will support the development of documentation for the critical-decision process.
414.1C 06/17/05	Quality Assurance	Establishes an effective quality assurance management system using the performance requirements of this Order, coupled with technical standards, where appropriate.
420.1B 12/22/05	Facility Safety	Where no specific requirements are specified concerning natural phenomena hazard mitigation, requires model building codes or national consensus industry standards to be used in the design of the proposed railroad facilities.
430.1B 09/24/03	Life-Cycle Asset Management, Building Codes, and Value Engineering	Establishes procedures to follow in all phases of the management of DOE facilities.
430.2A 04/15/02	Energy Management	Requires design for the proposed railroad to be in compliance with the energy management plan, sustainable design, and water efficiency required by this Order.
440.1A 03/27/98	Worker Protection Management for DOE, Federal and Contractor Employees, and Fire Protection	Establishes a comprehensive worker protection program that ensures that DOE and its contractor employees have an effective worker protection program to reduce or prevent injuries, illnesses, and accidental losses by providing DOE, federal, and contractor workers with a safe and healthful workplace.
450.1 01/03/07	Environmental Protection Program	Establishes DOE policy to conduct its operations in an environmentally safe and sound manner and to conduct its activities in compliance with applicable laws and regulations through implementation of environmental management systems at DOE sites.

Table 6-4. Potentially applicable DOE Orders (page 2 of 2).

Order number and date of last revision	Subject	Description[a]
451.1B[b] 09/28/01	NEPA Compliance Program	Establishes DOE requirements and responsibilities for complying with NEPA.
460.1B 4/4/03	Packaging and Transportation Safety	Establishes requirements and assigns responsibilities for the safe transport of hazardous materials, hazardous substances, hazardous wastes, and radioactive materials.
460.2A 12/22/04	Transportation and Packaging Management	Establishes DOE polices and requirements to supplement applicable laws, rules, regulations, and other DOE Orders for materials, transportation and packaging operations.
470.2B 10/31/02	Independent Oversight and Performance Assurance Program	Prescribes the requirements and responsibilities to enhance safeguards and security; cyber security; emergency management; environment, safety, and health programs; and other critical functions by providing an independent evaluation of the adequacy of DOE policy and the effectiveness of line management performance.
470.4 08/26/05	Safeguards and Security System Design	Requires the design of the proposed railroad facilities to provide site-specific safeguards and security protection or to tailor the physical protection elements in a number of areas, as described in the Order.
5400.5 01/07/93	Protection of Public from Radiation Risks	Establishes standards and requirements for operations of DOE and DOE contractors for protection of members of the public and the environment against undue risk from radiation.
5480.19 10/23/01	Conduct of Operations Requirements for DOE Facilities	Provides requirements and guidelines for departments to use in developing directives, plans, and procedures for conducting operations at DOE facilities that should result in improved quality and uniformity of operations.

a. DOE = U.S. Department of Energy; NEPA = National Environmental Policy Act.
b. DOE Order 451.1B was modified by a DOE Notice (DOE N 451.1, 10/6/06).

6.5 Bureau of Indian Affairs Requirements

The regulations at 25 CFR Part 169 prescribe the procedures, terms, and conditions under which the U.S. Department of the Interior, Bureau of Indian Affairs, may grand rights-of-way over and across tribal land, individually owned land, and Federal Government-owned land; subsection 169.23 outlines that rights-of-way for railroads shall not exceed 50 feet in width on each side of the centerline of the railroad, except where there are heavy ***cuts*** and ***fills***, when they shall not exceed 100 feet in width. The regulations at 25 CFR Part 162 identify the conditions and authorities under which the Bureau of Indian Affairs may lease certain interests in Indian land and Federal Government land.

6.6 Bureau of Land Management Requirements

As a cooperating agency, the BLM may adopt this Rail Alignment EIS for the disclosure and analysis of potential environmental impacts, as required by NEPA.

The Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*) established procedures for acquiring access to public lands. The regulations regarding ***withdrawals*** of public-domain land from public use, as codified at 43 CFR Part 2300, and the establishment of right-of-way reservations, as codified at 43 CFR Part 2800, primarily govern access to, and use of, BLM-administered lands. Construction and operation of a proposed railroad along either the Caliente rail alignment or the Mina rail alignment would require access to BLM-administered lands through application to the BLM for a

right-of-way grant. A right-of-way grant is an instrument issued pursuant to Title V of the Federal Land Policy and Management Act authorizing the use of a right-of-way over, upon, under, or through public lands for construction, operation, maintenance, and termination of a project.

The BLM-authorized officer considers whether the application is in compliance with the purpose for which the public lands are managed and the public interest. The Federal Land Policy and Management Act requires the authorized officer, prior to issuing a right-of-way grant or temporary-use permit, to perform the following tasks:

- Complete an environmental analysis in accordance with NEPA using the Council on Environmental Quality regulatory provisions for implementing NEPA (40 CFR Parts 1500 through 1508) as the review guidelines.
- Determine compliance of the applicant's proposed plan with applicable federal and state laws.
- Consult with all other federal, state, and local agencies having an interest.
- Take any other action necessary to fully evaluate and make a decision to approve or deny the application and prescribe suitable terms and conditions for the grant (reservation) or permit.

The BLM-authorized officer may hold public meetings on an application for a right-of-way grant if it is determined that such meetings are appropriate and that sufficient public interest exists to warrant the time and expense for such meetings.

Requirements of the application for a right-of-way grant are outlined at 43 CFR 2802.3. Requirements include a description of the proposal and a map (aerial photo or equivalent) showing the approximate location of the proposed right-of-way and facilities on public lands and existing improvements adjacent to the proposal. The BLM-authorized officer may require the applicant to submit additional information such as a description of the ***common segments*** and ***alternative segments*** considered; a statement of need and economic feasibility of the proposal; and a statement of the environmental, social, and economic effects of the proposal.

The regulations specify that all right-of-way grants assigned under 43 CFR Part 2800 contain terms, conditions, and stipulations as required by the authorized officer regarding extent, duration, survey, location, construction, operation, maintenance, use, and termination. Stipulations typically include the following requirements:

- Restoration, revegetation, and curtailment of erosion of the surface of the land, or any other rehabilitation measure determined necessary
- Assurance that activities in connection with the grant or permit do not violate applicable air- and water-quality standards or related facility siting standards established by or pursuant to applicable federal or state law
- Controls or prevention of damage to scenic, aesthetic, cultural, and environmental values including damage to fish and wildlife habitat, damage to federal property, and hazards to public health and safety
- Compliance with state standards for public health and safety, environmental protection and siting, construction, operation, and maintenance, when those standards are more stringent than federal standards

The Federal Land Policy and Management Act, by which the government accomplishes most federal land withdrawals, contains a detailed procedure for application, review, and study by the BLM of the withdrawal of public domain land. The BLM submits the application to the Secretary of the Interior for approval of the terms and conditions of withdrawal. Withdrawals accomplished through the Act remain valid for no longer than 20 years unless extended after further review and approval by the Secretary of the Interior.

On December 19, 2003, DOE submitted *Application for Administrative Land Withdrawal for Potential Rail Corridor* (DIRS 177745-Arthur 2003, all) to the BLM, pursuant to Section 204 of the Federal Land Policy and Management Act. The purpose of the application was to withdraw 124.9 square kilometers (308,600 acres) of public land encompassing the Caliente rail corridor from ***surface entry*** and new ***mining claims*** for 20 years to evaluate the land for potential construction and operation of the proposed railroad. On December 29, 2003, the BLM issued a notice in the *Federal Register* of the proposed land withdrawal (*Notice of Proposed Withdrawal and Opportunity for Public Meeting*; *Nevada*, 68 *FR* 74965).

The notice segregated the land from surface entry and mining for a period of up to 2 years to allow a ***case file*** containing various studies and analyses to be prepared to support a final decision on the withdrawal application. The action would not transfer the land to DOE control. The BLM would continue to manage the withdrawal area in compliance with BLM resource management plans. In a May 21, 2004, Notice of Public Meetings, the BLM invited the public to submit written comments and gave notice of two public scoping meetings on the proposed land withdrawal and possible land-use plan amendments (*Notice of Public Meetings; Notice of Intent to Amend the Caliente Management Framework Plan, Schell Management Framework Plan, Tonopah Resource Management Plan, and the Las Vegas Resource Management Plan; Nevada*; 69 *FR* 29323). Separately from this Rail Alignment EIS, DOE prepared and released an environmental assessment in December 2005, *Environmental Assessment for the Proposed Withdrawal of Public Lands Within and Surrounding the Caliente Rail Corridor, Nevada* (DIRS 176452-DOE 2005, all), proposing the continued segregated effect of the land by withdrawing the land for a preferred period of 10 years. On December 28, 2005, the BLM withdrew the requested lands, subject to valid existing rights, from settlement, sale, location, or entry under general land laws, including the United States mining laws (30 U.S.C. Chapter 2), but not from leasing under the mineral leasing laws (for example, the Mineral Leasing Act of 1920, as amended [30 U.S.C. 181 *et seq.*]), for a period of 10 years (70 *FR* 76854).

DOE initiated a further application for land withdrawal and requested that the Secretary of the Interior withdraw a total of 84.19 square kilometers (208,037 acres) of public lands from surface entry and mining through December 27, 2015. Thereby the BLM issued a notice on January 10, 2007 in the *Federal Register* of this application by DOE (*Notice of Proposed Withdrawal and Opportunity for Public Meeting; Nevada*; 72 *FR* 1235). This notice included an additional 27.78 square kilometers (68,646 acres) of public lands for evaluation along the Caliente rail corridor, and 56.41 square kilometers (139,391 acres) of public lands for the purpose of evaluating the potential construction, operation, and maintenance of a rail line along a suite of alternative segments and common segments referred to by the DOE as the "Mina Route." The expiration date for this proposed withdrawal is the same (December 27, 2015) as in the earlier December 28, 2005 BLM land withdrawal.

Implementation of the Proposed Action along the Caliente rail alignment or the Mina rail alignment would require a BLM right-of-way grant for use and access to BLM-administered lands that would be disturbed for rail line construction and operation. The BLM may issue a right-of-way grant for temporary or long-term use of land, and before issuing a right-of-way grant, must complete an environmental analysis in accordance with the National Environmental Policy Act of 1969. As a cooperating agency in the preparation of this Rail Alignment EIS, the BLM may adopt this document as authorized by 40 CFR 1501 to satisfy the NEPA requirements for the right-of-way application.

6.7 U.S. Army Requirements

The U.S. Army is a consulting agency to DOE in the preparation of this Rail Alignment EIS. Under the Mina Implementing Alternative (the nonpreferred alternative), DOE would need to construct and operate the ***Staging Yard*** on the Hawthorne Army Depot in Mineral County. DOE would do so in conformance with existing permits issued to the Hawthorne Army Depot by the State of Nevada, Division of Environmental Protection. Table 6-5 lists the permits for the main site at the Hawthorne Army Depot.

Table 6-5. Permits for the Hawthorne Army Depot main site at Hawthorne, Nevada, issued by the State of Nevada, Division of Environmental Protection.[a]

Permit	Type	Permit number
Class I, Title V, Main Base	Air	AP9711-0863.01
Class I Construction, hazardous waste generator	Air	AP9711-1145
Class I Construction, Bulk Energetics Demilitarization System	Air	AP9711-1489
Wastewater, Plasma Ordnance Demilitarization System	Groundwater	NEV2003516
Wastewater, Western Area Demilitarization Facility	National Pollutant Discharge Elimination System	NV0021946
Stormwater	Clean Water Act	NVR050000
Treatment storage and disposal system, storage open burn, incineration	Resource Conservation and Recovery Act, C	HW0017
Solid-waste and fill	Resource Conservation and Recovery Act, D	Waiver No. SWMI-09-68
Solid-waste landfill	Resource Conservation and Recovery Act, D	SW-1209702
Drinking water	Solid Waste Disposal Act	MI-0357-12C
Water Treatment Facility	Groundwater	NEV2004524

a. Source: DIRS 181385-Millsap 2007, all.

CHAPTER 7. BEST MANAGEMENT PRACTICES AND MITIGATION

This chapter describes the best management practices DOE would implement to help avoid impacts to environmental resources and the measures the Department would consider to mitigate adverse impacts from constructing and operating the proposed railroad under the Caliente Implementing Alternative or the Mina Implementing Alternative, as appropriate. Mitigation measures include only those actions that would be above and beyond compliance with statutory and regulatory requirements and implementation of best management practices DOE has incorporated into the Proposed Action.

Glossary terms are shown in ***bold italics***.

During planning and design of the proposed railroad, the U.S. Department of Energy (DOE or the Department) used various engineering and site evaluation and planning measures to avoid, minimize, or otherwise reduce environmental ***impacts***. These measures included the elimination of certain ***alternative segments*** as unreasonable and moving the location of specific segments. The Department took many of these actions in response to comments received during the scoping periods for this Rail Alignment EIS. As the environmental analyses have progressed, DOE has refined the Caliente ***rail alignment*** and the Mina rail alignment to avoid certain sensitive environmental features and reduce potential impacts to sensitive areas by limiting the project's ***footprint*** in such areas. Chapter 2 and Appendix C describe this process.

As described in Chapter 2 and shown in Figure 7-1, engineering and site evaluation and planning represent the initial step toward avoiding, minimizing, or otherwise reducing the environmental impacts of the Proposed Action.

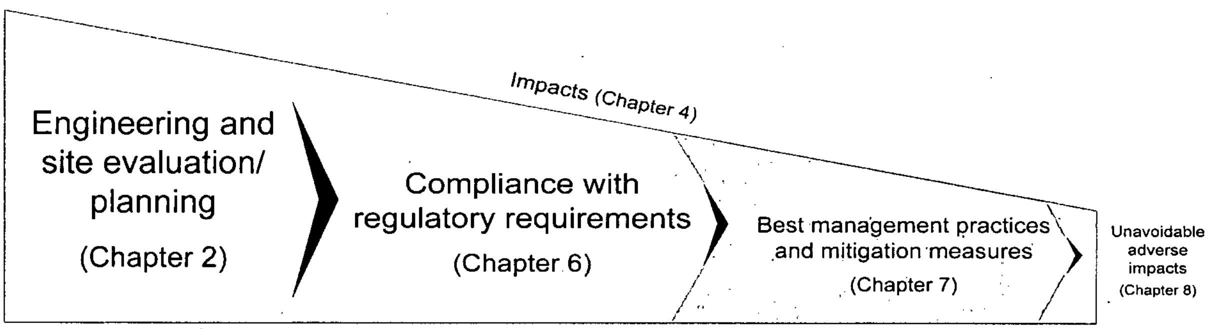

Figure 7-1. Multi-step approach to avoid, minimize, or reduce environmental impacts.

In addition to engineering and site evaluation and planning practices, DOE must also comply with all applicable environmental requirements (see Chapter 6). DOE incorporated a variety of best management practices into the ***Proposed Action*** that relate to these requirements and would further reduce the environmental impacts of constructing and operating the proposed ***railroad***.

After consideration of engineering and site evaluation and planning measures, compliance with environmental requirements, and application of best management practices, DOE would also consider various ***mitigation*** measures to further avoid, minimize, rectify, reduce, or compensate for any remaining adverse environmental impacts. DOE regards mitigation measures as activities or actions that would be above and beyond compliance with statutory and regulatory requirements and the application of the best management practices DOE has incorporated into the Proposed Action.

7.1 Representative Best Management Practices

> **Best Management Practices**
>
> Practices, techniques, methods, processes, and activities commonly accepted and used throughout the construction and railroad industries that DOE would implement as part of the Proposed Action to facilitate compliance with applicable requirements and that provide an effective and practicable means of preventing or minimizing the adverse impacts of an action on human health and the environment.

As part of the Proposed Action, DOE would implement appropriate best management practices to prevent or minimize environmental impacts. Table 7-1 lists, but does not limit, such practices. Some of the representative best management practices listed in Table 7-1 could change depending on the requirements included in permits and ***right-of-way grants*** applicable to construction and operation of the proposed railroad. The table identifies the affected resource area(s) for each best management practice, the requirement(s) the practice would support (see Chapter 6), and the purpose of the practice.

7.2 Mitigation

As the agency responsible for administering the federal lands over which the proposed railroad would cross, the Bureau of Land Management (BLM), an agency of the U.S. Department of the Interior, would have a substantial role in development of any necessary mitigation measures and monitoring requirements on the affected lands.

7.2.1 MITIGATION ACTION PLAN

> **Mitigation** (40 CFR 1508.20) includes:
>
> Avoiding the impact altogether by not taking a certain action or parts of an action.
>
> Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
>
> Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
>
> Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
>
> Compensating for the impact by replacing or providing substitute resources or environments.

DOE regulations at 10 Code of Federal Regulations (CFR) 1021.331 requires the preparation of a mitigation action plan when DOE identifies mitigation commitments in the ***Record of Decision*** for this Rail Alignment EIS. If a mitigation action plan is necessary, it would follow the Record of Decision and would provide details about mitigation commitments and provisions provided in the Record of Decision, if any. DOE must prepare the mitigation action plan before it could take any action authorized by the Record of Decision that would be subject to a mitigation measure or commitment. The Plan would contain:

- An introduction describing the basis, function, and organization of the Plan
- A summary of the impacts to be mitigated
- A description of specific mitigation measures

- A description of the Mitigation Action Plan monitoring and reporting system that DOE would implement to ensure that elements of the Plan were met and were effective
- A schedule for actions and identification of the responsible parties

7.2.2 MONITORING

If DOE implemented the Proposed Action along the Caliente rail alignment or the Mina rail alignment, the Department would implement any mitigation measures and commitments specified in the Record of Decision. As needed, DOE would adapt mitigation measures to accomplish their intended objectives. As required by 40 CFR 1505.2(c), DOE would adopt and summarize a monitoring and enforcement program where applicable for any mitigation.

7.2.3 MITIGATION MEASURES

Table 7-2 summarizes potential mitigation measures for potential impacts along the proposed railroad. Each mitigation measure is linked to an identified potential impact, and is either location specific or global (applicable to the entire appropriate ***region of influence***), depending on the level of knowledge and degree of certainty regarding the extent, duration, and location of the potential impact. Mitigation measures would continue to evolve with project development and could change or become more specific and refined in a mitigation action plan following a Record of Decision for this Rail Alignment EIS (see Section 7.2.1). Consistent with the definition of mitigation described above, the mitigation measures identified in Table 7-2 include only those actions that would be above and beyond compliance with statutory and regulatory requirements and implementation of best management practices DOE has incorporated into the Proposed Action.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 1 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Pre-construction best management practices			
Prior to ground-disturbing activities, collect data to plan for the restoration of disturbed areas and minimize impacts to sensitive ***habitats***. This could include collecting satellite data to identify previously disturbed land, surveying vegetation, and looking for special status species habitat.	Physical Setting Aesthetic Resources Biological Resources	50 CFR Part 402 – Interagency Cooperation Endangered Species Act Of 1973, as Amended	Minimize impacts to sensitive habitats and species. Promote effective restoration efforts.
General employee training for construction personnel would include a desert tortoise education program. Surveys would be conducted prior to clearing vegetation at previously undisturbed sites within the range of the desert tortoise. For areas within the desert tortoise range, a desert tortoise biologist or environmental monitor would be available during construction activities to help ensure that desert tortoises are not inadvertently harmed. Project activities that may endanger desert tortoises would cease if a tortoise is found on a project site and activities would resume only after a biologist or environmental monitor ensures that the tortoise is not in danger or after the tortoise has been moved to a safe area. The worker education program would also include training to prevent the intentional or unintentional take of sensitive or protected plant and animal species, State of Nevada game species, or wild horses and burros.	Biological Resources	Endangered Species Act Of 1973, as Amended	Minimize impacts to desert tortoises.
Minimize groundbreaking or land clearing activities during the critical nesting period for migratory birds, which the BLM defines as May 1 through July 15. If groundbreaking or land-clearing activities must be conducted during the bird nesting season, DOE would conduct surveys for migratory bird nests prior to any of those activities. All activities that would harm nesting birds or result in nest abandonment would be prohibited.	Biological Resources	Migratory Bird Treaty Act	Avoid harm to migratory birds, their nests, and their young.
Coordinate with local Floodplain Administrators to ensure that new project-related stream and ***floodplain*** crossings are appropriately designed to minimize impacts. DOE would incorporate hydraulic modeling into the engineering design process to ensure that all crossings would be designed to limit adverse impacts.	Surface-Water Resources	10 CFR Part 1022 – Compliance with Floodplain/Wetlands Environmental Review Requirements	Minimize risks to streams and floodplains.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 2 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Pre-construction best management practices			
Position temporary pipelines to prevent obstructing or redirecting surface runoff and to prevent obstructing natural drainage channels.	Surface-Water Resources	Clean Water Act of 1977 33 CFR Part 323 NAC 445A – Water Controls	Prevent flooding or surface-water ponding.
Require construction contractors to prepare and submit a stormwater pollution prevention plan. This plan would be prepared consistent with state and federal standards for construction activities and would detail practices that would be employed to minimize soil loss and degradation to nearby water resources. Such practices could include those listed in the *Best Management Practices Handbook* developed by the Nevada Division of Environmental Protection and the Nevada Division of Conservation Districts (DIRS 176309-NDEP 1994, all), and the *Storm Water Quality Manuals Construction Site Best Management Practices Manual* developed by the Nevada Department of Transportation (DIRS 176307-NDOT 2004, all).	Surface-Water Resources	40 CFR Part 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*)	Control site runoff and minimize erosion.
Continue to solicit input from American Indians to identify the potential for impacts to American Indian cultural resources, discuss potential solutions, and avoid adverse impacts. Comply with all regulatory requirements that protect American Indian interests.	Cultural Resources American Indian Interests	Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*	Minimize impacts to American Indian cultural resources.
Conduct final field surveys (an intensive BLM ***Class III inventory***) of the ***construction right-of-way***, as described in the Programmatic Agreement (see Appendix C) between DOE, the BLM, the Surface Transportation Board, and the Nevada State Historic Preservation Office.	Cultural Resources	National Historic Preservation Act, 36 CFR Part 800 – Protection of Historic Properties	Minimize impacts to cultural resources.
Consult with American Indian tribes and protect their access to ***public lands*** that contain American Indian cultural resources.	Cultural Resources American Indian Interests	American Indian Religious Freedom Act of 1978 Executive Order 13007, *Indian Sacred Sites*	Minimize impacts and allow access to sacred American Indian sites.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 3 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Pre-construction best management practices			
Notify all potentially affected utility owners prior to project-related construction activities and coordinate with the owners to minimize impacts to utilities. Consult with utility owners to design the ***rail line*** so that utilities are protected during project-related construction activities. Contact Nevada Underground Service Alert so they can locate and mark underground facilities to prevent possible damage to underground utility lines, injury, property damage, and service outages.	Land Use and Ownership Utilities, Energy, and Materials Occupational and Public Health and Safety	NAC 455 – Excavations and Demolitions	Prevent damage to utilities, avoid and/or minimize disturbances to utility service, and avoid injuries to workers.
Prior to initiation of construction activities in the area, provide appropriate information regarding construction plans and schedules for the proposed rail line to fire departments and other local emergency planning agencies within the project area. Communicate updates and changes in the construction plans to appropriate parties as needed.	Occupational and Public Health and Safety	40 CFR Part 355 – Emergency Planning and Notification	Facilitate local emergency response planning and community awareness.
Prior to initiating any project-related construction activities, develop a spill prevention plan for petroleum products and other hazardous materials during construction activities. Ensure that equipment is available to respond to spills and identify the location of such equipment. In the event of a reportable spill, comply with the spill prevention plan and applicable federal, state, and local regulations pertaining to spill containment and appropriate cleanup. Make the required notifications to the appropriate federal and state environmental agencies in the event of a reportable hazardous materials release.	Hazardous Materials and Waste Occupational and Public Health and Safety Biological Resources Surface-Water Resources Groundwater Resources	40 CFR Part 112 – Oil Pollution Prevention 40 CFR Part 263 – Standards Applicable to Transporters of Hazardous Waste 40 CFR Part 302 – Designation, Reportable Quantities and Notification	Prevent release of oil and chemicals during construction. Establish effective spill response procedures. Minimize adverse environmental effects of a spill. Ensure appropriate cleanup of spilled material.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 4 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Pre-construction best management practices			
Develop internal emergency response plans for use during proposed rail line construction and operations to ensure that appropriate agencies and individuals are notified in case of an emergency. Provide the emergency response plans to appropriate state and local entities prior to any rail construction activities. Ensure such plans fully delineate the roles and responsibilities of all parties.	Hazardous Materials and Waste Occupational and Public Health and Safety	The Nuclear Waste Policy Act of 1982	Facilitate emergency response planning and enhance emergency response capabilities.
Provide fire departments and local emergency response agencies with a toll-free number for the DOE contact, who will be available to answer questions or attend meetings for the purpose of informing emergency-service providers about the project construction and operations. Revise this information, including changes in construction schedule, as appropriate. Before the start of operations, contact any local emergency response agencies to provide them with information concerning the proposed operations to allow them to incorporate the information into local response plans.	Hazardous Materials and Waste Occupational and Public Health and Safety	40 CFR Part 355 – Emergency Planning and Notification 49 CFR Part 172 – Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements NAC 705 – Railroads	Facilitate communication to ensure state and local emergency response efforts are up to date. Ensure local response plans are up to date before the start of operations.
Develop and implement an Ordnance and Explosives Safety Construction Support Program applicable to construction activities. Include ordnance and explosives training for all construction personnel working in the areas designated by the U.S. Department of Defense (DoD) as being at risk of containing unexploded ordnance. DOE may employ a full-time unexploded-ordnance technician to oversee construction activities in areas near the Nevada Test and Training Range.	Hazardous Materials and Waste Occupational and Public Health and Safety	DoD Directive 4715.11 – Environmental and Explosives Safety Management on DoD Active and Inactive Ranges Within the U.S. 29 CFR 1910.120 and 1926.65 – Hazardous Waste Operations and Emergency Response Standard	Identify, evaluate, and control safety and health hazards related to unexploded ordnance on DoD property.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 5 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Pre-construction best management practices			
Adopt a rigorous safety program that would enable workers to avoid the most common accidents.	Occupational and Public Health and Safety	DOE Order O 440.1A, Worker Protection Management for DOE Federal and Contractor Employees 29 CFR Part 1926, Safety and Health Regulations for Construction 29 CFR Part 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters	Ensure health and safety of construction workers during construction.
As appropriate, remove and stockpile topsoil that will be needed later for application during reclamation of disturbed areas. Stabilize topsoil stockpiles to prevent erosion. If the topsoil would remain in a stockpile for more than one year, seed with ***native plant species***. Periodically monitor and maintain the topsoil reserve to keep it stable and minimize erosion until it is used during reclamation efforts.	Physical Setting Biological Resources Surface-Water Resources	43 CFR Part 2800 – Rights-of-Way, Principles and Procedures; Rights-of-Way Under the Federal Land Policy and Management Act and the Mineral Leasing Act 40 CFR Part 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System	Re-establish the stability and productivity of land subjected to surface disturbances through proper soils management. Preserve native seed stock contained in topsoil. Minimize erosion and control stormwater runoff to maintain water quality.
Construction best management practices			
Phase construction to the extent practicable. Limit grading activities to the phase immediately under construction and limit ground disturbance to areas necessary for project-related construction activities. Identify limits of disturbance on maps and in the field, and convey to construction personnel. Implement erosion and sediment control measures prior to and during construction.	Physical Setting Surface-Water Resources Groundwater Resources Biological Resources	40 CFR Part 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System 10 CFR Part 1022 – Compliance with Floodplain/Wetlands Environmental Review Requirements Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*)	Minimize and control stormwater runoff to maintain water quality. Minimize ground disturbance and disturbance to vegetation, wetlands, streams, floodplains, and other sensitive environments.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 6 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Establish staging and laydown areas for project-related construction material and equipment away from streams and wetlands and in areas that are not environmentally sensitive. Avoid clearing vegetation between the staging area and the waterway or wetlands. When project-related construction activities, such as ***culvert*** and bridge work, require work in streambeds, conduct these activities, to the extent practicable, during minimum-flow conditions. Maintain current drainage patterns to the greatest extent practicable. Prohibit project-related construction vehicles from driving in or crossing streams and/or ***washes*** at locations other than established crossing points. Place heavy equipment on mats when working in wetlands or use other methods to minimize soil disturbance in wetlands.	Physical Setting Surface-Water Resources Biological Resources	10 CFR Part 1022 – Compliance with Floodplain/Wetlands Environmental Review Requirements Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*) NAC 445A – Water Controls Fish and Wildlife Coordination Act	Protect surface-water quality and floodplains. Minimize project-related increases in turbidity and impacts to ***waters of the United States***.
During construction, use temporary barricades, fencing, and/or flagging to demarcate sensitive habitats; contain project-related impacts to the area within the construction right-of-way. When practicable, locate staging areas in previously disturbed sites or in construction right-of-way, and avoid sensitive habitat areas. Fence off areas of habitat for sensitive species or other special resources, such as wetlands, prior to ground-disturbing activities. Inform project workers of all resource protection goals.	Physical Setting Surface-Water Resources Biological Resources	Frequently a Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*) permit condition or a result of Section 7 consultation under the Endangered Species Act Of 1973, as Amended	Minimize impacts to sensitive habitats and species.
Use a minimum-width rail line footprint when practicable. DOE would limit disturbance within the construction right-of-way in the areas where it could not completely avoid wetlands.	Surface-Water Resources Biological Resources	10 CFR Part 1022 – Compliance with Floodplain/Wetlands Environmental Review Requirements Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*)	Minimize impacts to wetlands.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 7 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Require periodic inspections of equipment for any fuel, lube oil, hydraulic, or antifreeze leaks. If leaks are found, repair the leak or replace the equipment.	Hazardous Materials and Waste Occupational and Public Health and Safety Surface-Water Resources Groundwater Resources Biological Resources	Pollution Prevention Act of 1990 (42 U.S.C. 133)	Avoid accidental discharge of pollutants.
Use storage tanks, ponds (temporary holding reservoirs), or inflatable bladders along the rail alignment to help manage water ***demand***, such as to control ***groundwater*** withdrawal rates and pumping timetables.	Surface-Water Resources Groundwater Resources	NRS 533.324 through 533.435 – Water Appropriation Permit	Maximize water-use efficiency during construction activities.
Use treated wastewater effluent (***gray water***) produced at the camps for dust suppression and soil compaction to reduce the demands placed on groundwater wells.	Groundwater Resources	NAC 534 – Underground Water and Wells NRS 533.324 through 533.435 – Water Appropriation Permit	Reduce ***aquifer*** drawdown.
If determined through impacts analysis to be possibly or likely required to preclude impacts on an existing well or spring, limit pumping rates or eliminate pumping at a proposed new groundwater withdrawal well, obtain (purchase) additional water from existing water-rights holder(s), relocate a proposed new well to an alternative location, or implement one or more other best management practices as necessary. Alternatively, DOE would negotiate with the existing water-rights holder or domestic water-well owner to access and monitor water levels in the existing well or monitor discharge rates to the spring, where appropriate, to verify the effects, if any, of the proposed groundwater withdrawal on those wells or springs.	Groundwater Resources	NAC 534 – Underground Water and Wells NRS 533.324 through 533.435 – Water Appropriation Permit	To preclude a reduction in flow rate to an existing well or a reduction in discharge rate to a spring.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 8 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Provide alternate sources of water or relocate wells if DOE action prevents access to groundwater. Any action to change the location of an existing water diversion would require the approval of the well owner and/or the holder of the water rights associated with that diversion point and would require a permit from the State of Nevada under Nevada Revised Statutes (NRS) 533.325.	Groundwater Resources	NRS 533.325 – Application to State Engineer for Permit	To ensure continued access to wells and groundwater.
Keep disturbance around known areas of underground utilities to a minimum. Ensure that work crossing any buried utility line would not be started until all material and equipment was available for immediate use. Complete work as quickly as possible; keep exposure of existing utilities to a minimum. Install underground utility crossings within protective casings buried in trenches beneath the rail and surround the utility line with appropriate backfill material.	Utilities, Energy, and Materials Occupational and Public Health and Safety Land Use and Ownership	NAC 455 – Excavations and Demolitions NAC 704A – Facilities Placed Underground	Prevent inadvertent disruption to utilities, destruction of property, and injury to DOE contractors. Ensure future functionality and safety of underground utilities.
Implement ***fugitive dust*** suppression per applicable permits, such as spraying water, the use of crusting agents, or other approved measures to minimize fugitive dust emissions created during project-related construction activities, including activities on haul roads and at quarries.	Aesthetic Resources Air Quality Occupational and Public Health and Safety	40 CFR Part 50 – National Primary and Secondary ***Ambient Air Quality Standards*** 29 CFR 1910-1000 – Occupational Health and Safety Standards	Meet ***ambient air*** quality standards during construction.
Maintain construction equipment to ensure that exhaust and muffler systems and other required pollution-control and noise-control devices are in good working condition. Administer a continuing, effective hearing conservation program in accordance with the Occupational Safety and Health Administration standards.	Air Quality Noise and Vibration Occupational and Public Health and Safety	40 CFR Parts 61 and 63 – National Emission Standards for Hazardous Air Pollutants and Noise Control Act of 1972 Federal Railroad Administration Regulation 49 CFR 229.121 Mine Safety and Health Administration Regulation 30 CFR 62	Minimize exhaust, emissions, and noise during construction and operations.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 9 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Implement construction activities with the goal of minimizing, to the extent practicable, construction-related noise disturbances near any residential areas; coordinate and communicate these goals to construction contractors.	Noise and Vibration Occupational and Public Health and Safety	Noise Control Act of 1972 49 CFR Part 210, Rail Noise Emission Compliance Regulations	Minimize rail line construction noise.
Conduct routine monitoring for occupational dust exposure during quarry construction and operations and during rail alignment construction activities that would potentially expose workers, such as ***ballast*** placement. Apply engineering controls such as the application of water for dust suppression and washing the ballast before placement. An industrial hygienist would take mineral dust measurements to identify potential exposure. Implement the use of personal protective equipment, such as respirators, and other measures to reduce occupational exposure to silica in the event aforementioned activities are not effective in reducing such exposure.	Occupational and Public Health and Safety	29 CFR 1910 – Occupational Safety and Health Standards	To prevent exposure to crystalline silica, ***erionite***, or cristobalite.
Reduce packaging wastes by purchasing supplies in bulk; purchase recycled or recyclable goods; and reuse waste paper and Styrofoam™ as packaging materials and fillers (DIRS 182385-Burns 2007, all).	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Eliminate excessive resource use and trash generation.
Dispose of drill cuttings through land application.	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Prevent overburdening local landfill facilities with waste.
Promote the use of environmentally preferable products such as recovered materials (recycled-content products) and ***bio-based products*** (energy, industrial, and consumer products made from renewable biological resources such as wood, agricultural residues, and fiber crops). Purchase materials and equipment designated as long life, energy efficient, and sustainable if they are reasonably cost-effective and available (DIRS 182385-Burns 2007, all).	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Eliminate excessive resource use and trash generation.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 11 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Practice preventive maintenance, use recycled oil, and use oil additives that improve engine and oil performance.	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Increase the number of lubricating-oil changes to reduce leaks and drips and poor engine performance.
Where practicable, use biodegradable water-based solvents, substitute nonhazardous surfactants for hazardous surfactants for equipment cleaning, and reuse spent solvents. Paint only when necessary and use less-toxic, less-volatile paints.	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Reduce the production of ***hazardous wastes***.
Inspect and replace worn or damaged components. Use sealed components (DIRS 155558-Hoganson 2001, all).	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Reduce the production of hazardous wastes.
Establish and implement a centralized procurement and distribution program to purchase, track, distribute, and manage hazardous and toxic materials. Implement a Hazardous Material Management Program to review hazardous and toxic material requisitions and purchases; and to recommend feasible nonhazardous, biodegradable, or less-toxic substitutes, such as nonhazardous solvents, paints, and cleaning materials (DIRS 182385-Burns 2007, all).	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Reduce the production of wastes.
Implement an Environmental Management System and a Pollution Prevention/Waste Minimization Program, which would include an evaluation of alternatives to eliminate, reduce, or minimize the amounts of hazardous materials used and hazardous wastes generated. As part of the Environmental Management System, regularly perform Pollution Prevention Opportunity Assessments (DIRS 182385-Burns 2007, all).	Hazardous Materials and Waste	Executive Order 13101 – *Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions*	Reduce the production of wastes.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 12 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Construction best management practices			
Salvage extra materials not used as ballast for the rail alignment and use for other construction activities or for regrading during quarry reclamation activities (DIRS 176172-Nevada Rail Partners 2006, Section 3.1).	Hazardous Materials and Waste	Executive Order 13101 – Greening the Government through Waste Prevention, Recycling, and Federal Acquisitions	Reduce the generation of wastes and ***contamination*** of environmental media.
Store and dispose of biosolids (sludge), allowing them to dry according to applicable requirements. DOE would dispose of biosolids at a licensed facility in accordance with all applicable requirements (DIRS 176172-Nevada Rail Partners 2006, p. 4-6).	Hazardous Materials and Waste	40 CFR Part 503 – Standard for the Use or Disposal of Sewage Sludge	Ensure proper treatment and disposal of wastes.
Post-construction, operations, and maintenance best management practices			
Control ***noxious weeds/invasive species*** using approved herbicides and other pest-management techniques. Select herbicide products that would minimize impacts to water; apply the smallest effective amount of herbicide to reduce the risk of contamination from runoff and leaching. Adhere to herbicide labeling requirements. Plan to treat between weather fronts (calms) and at the appropriate time of day to avoid high winds and to avoid potential stormwater runoff. Establish buffer widths based on herbicide- and site-specific criteria to minimize impacts to water bodies.	Surface-Water Resources Groundwater Resources Biological Resources Occupational and Public Health and Safety	NAC 555 – Control of Insects, Pests, and Noxious Weeds Executive Order 13112, Invasive Species Federal Insecticide, Fungicide, and Rodenticide Act of 1948 (40 CFR Parts 152 through 186)	Prevent introduction of, or minimize impacts from, insects, pests, and noxious weeds. Minimize the risk of adverse effects to non-target species. Minimize the potential for adverse effects on water quality. Protect occupational and public health and safety.
Once construction is complete, revegetate disturbed areas within the right-of-way not required for operation of the rail line with native species or cover with angular rock fragments to prevent erosion. Use weed-free straw and mulch for revegetation and restoration activities. To the extent practicable, return all stream/wash crossing points to their preconstruction contours and reseed or replant the crossing banks with native species immediately following project-related construction. If weather or season precludes the prompt reestablishment of vegetation, employ measures such as mulching or erosion control blankets to prevent erosion until reseeding can be completed.	Physical Setting Aesthetic Resources Biological Resources Surface-Water Resources	43 CFR Part 2800 – Rights-of-Way, Principles and Procedures; Rights-of-Way Under the Federal Land Policy and Management Act and the Mineral Leasing Act The Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661 *et seq.*) NAC 555 – Control of Insects, Pests, and Noxious Weeds Executive Order 13112, *Invasive Species*	Reduce the visual scope of disturbed areas. Prevent loss of and damage to wildlife resources. Prevent introduction of invasive or exotic species.

Table 7-1. Representative best management practices and their relationships to applicable requirements[a,b] (page 13 of 13).

Best management practice	Related environmental resource area(s)	Associated requirement(s)[c]	Purpose
Post-construction, operations, and maintenance best management practices			
Once construction is complete, eliminate new quarry access roads by removing pavement and regrading road to original contours. Restore quarry walls to a 3-to-1 grade for public safety. Revegetate around quarry.	Physical Setting Biological Resources Surface-Water Resources	NAC 445 – Water Controls NAC 519A – Reclamation of Land Subject to Mining	Restoration of quarry sites. Minimize erosion. Protect public health.
Monitor reclaimed sites to determine whether reclamation success standards are being met.	Physical Setting Biological Resources	43 CFR Part 2800 – Rights-of-Way, Principles and Procedures; Rights-of-Way Under the Federal Land Policy and Management Act and the Mineral Leasing Act	Ensure success of site restoration.
When practical, use proven technologies to reduce idling time of trains.	Air Quality Utilities, Energy, and Materials	40 CFR Parts 61 and 63 – National Emission Standards for Hazardous Air Pollutants	Minimize exhaust emissions during construction and operations and minimize energy required for operations.
Provide training to emergency response units in the vicinity of the proposed rail line on how to respond to incidents potentially involving ***radioactive*** materials.	Hazardous Materials and Waste Occupational and Public Health and Safety	The Nuclear Waste Policy Act Of 1982	Facilitate emergency response planning and enhance emergency response capabilities.

a. Best management practices are the practices, techniques, methods, processes, and activities commonly accepted and used throughout the construction and railroad industries that DOE would implement as part of the Proposed Action to facilitate compliance with applicable requirements and that provide an effective and practicable means of preventing or minimizing the adverse impacts of an action on human health and the environment.

b. Requirements include laws, statutes, codes, regulations, and orders. DOE commits to appropriate best management practices that support implementation of such requirements and specific compliance requirements in project-related activities and approvals.

c. CFR = Code of Federal Regulations; DoD = U.S. Department of Defense; EPA = U.S. Environmental Protection Agency; NAC = Nevada Administrative Code; NRS = Nevada Revised Statutes; U.S.C. = United States Code.

Table 7-2. Potential measures to mitigate potential environmental impacts of constructing and operating the proposed railroad (page 1 of 3).

Environmental resource/project phase	Nature of potential impact	Mitigation measure	Agency jurisdiction	Location
Physical Setting (see Sections 4.2.1 and 4.3.1)				
Construction and operations	Human health risks attributed to ***seismic*** activities	During the construction and operations phases, adopt Railway Engineering and Maintenance-of-Way Association guidelines and implement monitoring procedures to reduce the potential for structural damage and human exposure to seismic hazards. DOE would make use of seismic monitoring with regional networks; early warning systems to identify track disruption; and track inspections immediately before transit of the trains.	DOE[a]	Site-specific as determined through seismic and geotechnical investigations.
Land Use and Ownership (see Sections 4.2.2 and 4.3.2)				
Construction	Land-use conflict	Notify nearby mining lessees/claimants and consult with owners of active local mines and ***mining claims*** to ensure that impacts to mine-related operations are minimized during construction activities.	DOE and BLM[a]	Site-specific dependent upon the locations of mining claims and active mines.
Construction and operations	Segmenting wildlife habitat	Limit fencing on public lands to those areas where safety is a concern, or where it is required for the safety of livestock.	DOE and BLM	Site-specific as determined through coordination with permittees and the BLM.
Construction	Construction schedule	To the extent practicable, minimize the number of road closures due to construction, and limit detours to one mile or less. DOE would inform the public of road closures through various media outlets.	DOE and BLM	Site-specific dependent upon the locations of road closures.
Air Quality and Climate (see Sections 4.2.4 and 4.3.4)				
Operations	Air quality impacts associated with quarries	Acquire additional land and move the public access (fence line) farther away from the quarries.	DOE	Site-specific quarry locations.

Table 7-2. Potential measures to mitigate potential environmental impacts of constructing and operating the proposed railroad (page 2 of 3).

Environmental resource/project phase	Nature of potential impact	Mitigation measure	Agency jurisdiction	Location
Biological Resources (see Sections 4.2.7 and 4.3.7)				
	Growth and/or spreading of noxious weeds and invasive species	Minimize watering of land surfaces for soil stabilization, ballast cleaning, vehicle washing, and dust suppression to the extent possible.	DOE	Various locations as warranted.
	Conifer mortality	Salvage and restore damaged conifers.	DOE	Specific locations as warranted.
	Attract wildlife to areas of active construction	Install a fence around any storage reservoirs. Install removable covers over storage reservoirs or basins as needed.	DOE	Applies to overall project.
Noise and Vibration (see Sections 4.2.8 and 4.3.8)				
	Elevated noise levels resulting from construction activities	Limit major noise producing activities, such as blasting and pile driving, near ***sensitive receptors***.	DOE	Specific locations as warranted.
	Elevated noise levels from operations such as locomotive warning horns	Apply for a Quiet Zone. Install quad gates, or other supplementary safety measures, to provide the level of warning necessary to allow the communities to request a waiver from the Federal Railroad Administration of the requirement to sound the horn at ***at-grade crossings***.	FRA[a]	Specific locations as warranted.
Socioeconomics (see Sections 4.2.9 and 4.3.9)				
	Overextend local law enforcement capacity	Staff ***construction camps*** with security personnel.	DOE	Construction camp sites.
Occupational and Public Health and Safety (see Sections 4.2.10 and 4.3.10)				
	Hantavirus infection of workers	Implement procedures for decontamination of any rodent excreta encountered by construction workers during construction activities.	DOE	Applies to overall project.
	Equipment and property damage and injury	Assign people, a source of water, and a water-tank trailer that would be used to respond to fire emergencies at the camps and construction areas.	DOE	Construction camp sites.

Table 7-2. Potential measures to mitigate potential environmental impacts of constructing and operating the proposed railroad (page 3 of 3).

Environmental resource/project phase	Nature of potential impact	Mitigation measure	Agency jurisdiction	Location
Hazardous Materials and Waste (see Sections 4.2.12 and 4.3.12)				
	Overburdening local landfill facilities with waste	Determine which landfills solid and ***industrial and special wastes*** would be sent to during the construction phase and balance the distribution. Send manageable quantities of ***solid waste*** to local landfills or send the waste to the larger Apex Landfill.	DOE	Applies to construction.
Cultural Resources (see Sections 4.2.13 and 4.3.13)				
	Adverse impacts or disturbances to cultural resources sites	Provide cultural resources training to workers.	DOE and SHPO[a]	Applies to construction and various locations along the rail alignments.
Paleontological Resources (see Sections 4.2.14 and 4.3.14)				
	Disturbance and/or destruction of paleontological resources	Perform pre-disturbance testing of physical resources within the rail line construction right-of-way where there could be a potential for important paleontological resources. Consult with the BLM to develop appropriate measures to minimize damage to paleontological resources during the construction phase if fossils were found.	DOE and BLM	Specific locations along the rail alignments.

a. BLM = Bureau of Land Management; DOE = Department of Energy; FRA = Federal Railroad Administration; SHPO = State Historic Preservation Office.

8. UNAVOIDABLE ADVERSE IMPACTS; SHORT-TERM USES AND LONG-TERM PRODUCTIVITY; IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

In accordance with the National Environmental Policy Act (NEPA), Section 102 (42 U.S.C. 4332), and the Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR 1502.16), this chapter addresses:

- Any adverse environmental impacts DOE would not be able to avoid if the Department implemented the Proposed Action along the Caliente rail alignment or the Mina rail alignment.
- The relationship between local short-term uses of the environment within the Caliente rail alignment or Mina rail alignment region of influence and the maintenance and enhancement of long-term productivity.
- Any irreversible and irretrievable commitments of resources if DOE implemented the Proposed Action along the Caliente rail alignment or the Mina rail alignment.

Glossary terms are shown in ***bold italics***.

8.1 Caliente Rail Alignment

During the engineering and site evaluation and planning phase for the proposed ***railroad***, DOE considered many factors to avoid or minimize potential environmental ***impacts*** (see Chapter 2), and would continue to consider these factors during the final design phase. DOE would meet all applicable regulatory requirements during proposed railroad construction and operations along the Caliente ***rail alignment***, and would implement an array of best management practices to ensure compliance with requirements (see Chapter 7, Best Management Practices and Mitigation). Also as described in Chapter 7, DOE could implement measures to mitigate any impacts remaining after final design and compliance with regulatory requirements and implementation of best management practices.

An **irreversible commitment** of resources represents a loss of future options. It applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those factors that are renewable only over long time spans, such as soil productivity.

An **irretrievable commitment** of resources represents opportunities that are foregone for the period of the proposed action. Examples include the loss of production, harvest, or use of renewable resources. The decision to commit the resources is reversible, but the utilization opportunities foregone are irretrievable.

However, there could be unavoidable adverse impacts (adverse impacts are impacts that could be viewed as having disproportionately negative effects); impacts to short-term uses and long-term productivity resources; and/or irreversible and irretrievable commitment of resources, for example:

- DOE could mitigate most potential impacts described in Chapter 4, but there would be some unavoidable impacts, for example, on the use of grazing land.
- Railroad construction would involve ground-disturbing activities that would result in localized ***short-term impacts***

to soil, water use, and ***habitat***. These resources would recover over time, and long-term productivity would not be affected.

- An irreversible commitment of resources such as consumption of fossil fuel, and an irretrievable commitment such as a loss of habitat.

This chapter summarizes and consolidates information from Chapter 4, Environmental Impacts, and Chapter 7, Best Management Practices and Mitigation.

8.1.1 UNAVOIDABLE ADVERSE IMPACTS

Engineering and site evaluation and planning are the first steps in undertaking a ***proposed action***. Next follows compliance with all laws, regulatory requirements, and stipulations and conditions of associated permits to minimize environmental and health-related impacts. Best management practices are implemented to maintain compliance with these requirements. Where analyses identify potential environmental impacts, ***mitigation*** measures are implemented to avoid, minimize, rectify, reduce, or compensate for those impacts. Finally, unavoidable adverse impacts may arise where there are no reasonably practicable mitigation measures to entirely eliminate impacts, and there are no reasonably practicable ***alternatives*** to the proposed project that would meet the purpose and need of the action, eliminate the impact, and not cause other or similar significant adverse impacts. Figure 8-1 illustrates how unavoidable adverse impacts may arise and identifies the chapters of this Rail Alignment ***Environmental Impact Statement*** (EIS) where the topic areas shown are discussed.

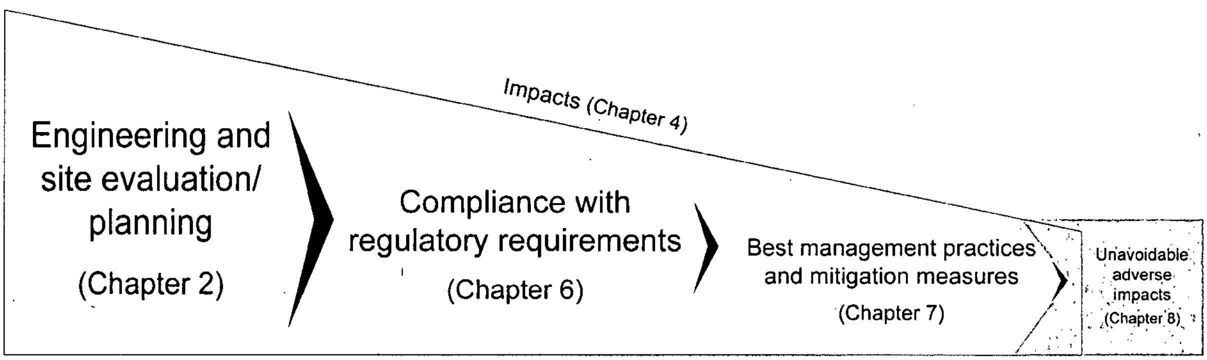

Figure 8-1. How unavoidable adverse impacts might arise.

Unavoidable adverse impacts would not vary substantially among alternative segments along the Caliente rail alignment, or by implementation of the ***Shared-Use Option***. Sections 8.1.1.1 to 8.1.1.15 describe unavoidable adverse impacts, if any, for each environmental resource area evaluated in this Rail Alignment EIS.

8.1.1.1 Physical Setting

Construction of the proposed railroad along the Caliente rail alignment would lead to permanent alterations in topography in the ***rail line construction right-of-way*** as a result of ***cuts*** and ***fills***, and in the locations of potential quarry sites. Cuts and fills would also alter local drainage patterns, and would remain after a possible future abandonment of the railroad. Cuts and fills associated with construction of any of the ***alternative segments*** could result in the loss of topsoil, and an increased potential for erosion. No mineral deposits would be removed; nevertheless, a rail line could unavoidably restrict access to such deposits. The Goldfield alternative segments would cross ***mining areas*** and could displace minerals or limit the boundaries for mining if mineral resources extended under the rail alignment. There would be potential impacts to isolated pockets of unused land classified as ***prime farmland*** along the Caliente or

Eccles alternative segment and Caliente ***common segment*** 1. As required under the Farmland Protection Policy Act (7 United States Code [U.S.C.] 4201 *et seq.*), which directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands, DOE has coordinated with the Natural Resources Conservation Service to minimize any potential conversion of land classified as prime farmland to nonagricultural uses. The 0.22 square kilometer (54 acres) of prime farmland soils along Caliente common segment 1 is in a relatively isolated area in Nye County (see DIRS 182843-Coogan and Bethoney 2007, Part A, plates 107 to 109), and at present is not being farmed. Construction of the proposed railroad along the Caliente rail alignment would result in the loss of a total of 0.43 square kilometer (110 acres) of prime farmland soils. Lincoln and Nye Counties contain approximately 1,500 square kilometers (370,000 acres) of prime farmland soils; thus, the proposed railroad would remove less than 0.1 percent of the prime farmland soils from productive use. Construction activities within the construction right-of-way would result in local soil compaction, which could impact the natural revegetation rate and vegetation types over time.

Any permanent alterations in topography that could not be mitigated could be viewed as unavoidable adverse impacts. As described in Section 4.2.1.2.1, topographic impacts due to major cut and fill and other earthwork processes would primarily occur along the Goldfield alternative segments and common segment 6, and around Bennett Pass, Goldfield Hills, Beatty, and Yucca Mountain. Tables 4-2 to 4-9 in Section 4.2.1 list specific amounts of disturbed surface areas for the Caliente rail alignment alternative segments, common segments, and ***construction and operations support facilities***. Any impacts to physical setting, although unavoidable, would be small.

8.1.1.2 Land Use and Ownership

Use of land along the Caliente rail alignment for construction and operation of the proposed railroad and railroad construction and operations support facilities would involve some long-term changes in land use. The land DOE would use for this project would be managed as a ***right-of-way grant*** obtained from the U.S. Department of the Interior, Bureau of Land Management (BLM). This would not pose a land-use conflict because the rights-of-way would not be in right-of-way avoidance areas. The BLM could establish land management requirements that provide for multiple use, but land used for the proposed railroad and railroad construction and operations support facilities could limit certain other land uses. The multiple-use mandate set forth in the Federal Land Policy and Management Act would continue to apply to the ***public lands*** within the right-of-way, but railroad construction and operations could limit certain future land uses that pose a conflict.

DOE would need to gain access to some private lands. Assuming a ***nominal*** 61-meter (200-foot) right-of-way on either side of the centerline of the rail line, this could result in a loss of about 1 percent of private land compared to the total amount of land that would be required for the project. The parking lot and access road to the Hot Springs Hotel would lie within the Caliente alternative segment construction right-of-way, and the loss of some parking area and the impact of noise during construction and operation of the rail line may cause the hotel to no longer remain viable. If the Caliente alternative segment is selected, DOE would negotiate with the hotel owner to gain access to the land. The Staging Yard at either of the Caliente options (Upland or Indian Cove) would be on private land.

Construction and operation of the proposed railroad along the Caliente rail alignment would directly impact ***grazing allotments*** by transecting parcels and potentially hindering access to forage and water resources. Other potential impacts include allotments being reduced in size and a reduced ability of livestock, wild horses, and burros to range freely across grazing areas. The Eccles-North Staging Yard would be on public land within an active grazing allotment. Even with mitigation, some adverse impacts to the use of grazing land would be unavoidable. Tables 4-23 to 4-30 in Section 4.2.2 summarize potential impacts to land use and ownership for each alternative segment, common segment, and railroad construction and operations support facility.

Construction and operation of the proposed railroad along the Caliente rail alignment would not displace existing or planned land uses over a large area or conflict with land-use plans or goals. Therefore, any impacts to land use and ownership, although unavoidable, would be small.

8.1.1.3 Aesthetic Resources

The ***region of influence*** for aesthetic resources is the ***viewshed*** around all Caliente rail alignment alternative segments, common segments, and railroad construction and operations support facilities, and any additional ***sidings*** that would be added under the Shared-Use Option. Operation of the proposed railroad along the Caliente rail alignment would remain consistent with BLM visual resource management objectives, under which areas of high visual value (Classes I and II) are managed to minimize contrast levels, and areas of lower visual value (Classes III and IV) are allowed higher contrast levels. There would be unavoidable visual changes associated with the proposed rail alignment. Contrast levels that were rated by DOE as none, weak, or moderate would be such that BLM visual resource management objectives would be met. In specific locations such as Garden Valley, which is classified as a more visually sensitive Class II area in the *Draft Ely Resource Management Plan* (DIRS 174518-BLM 2005), BLM visual resource management objectives also would be met.

8.1.1.4 Air Quality

Construction and operation of the proposed railroad along the Caliente rail alignment would cause unavoidable emissions of some ***criteria air pollutants***. Air pollutant concentrations would not exceed the National ***Ambient Air Quality Standards*** during construction and operation of the proposed railroad, with the possible exception of the 24-hour standard for ***particulate matter*** with an aerodynamic diameter less than or equal to 10 micrometers (***PM_{10}***) that DOE modeled as exceeded during quarry operations in South Reveille Valley during rail line construction. However, DOE will be required to obtain a Surface Area Disturbance Permit Dust Control Plan, issued by the State of Nevada, Department of Environmental Protection, prior to quarry development. DOE anticipates that compliance with the requirements of this plan to reduce ***fugitive dust*** emissions would decrease the possibility of exceedance of the ***air quality*** standard—for example, the requirement for cessation of all operations when winds make control of fugitive dust difficult (this was a mitigating attribute not accounted for in the modeling that DOE undertook). DOE could further reduce the possibility of exceeding the 24-hour standards for PM_{10} at a public boundary during quarry operations by acquiring additional land and moving public access farther away.

The highest increase in air pollutant emissions would occur during the construction phase. During the operations phase, the highest increase would occur in the vicinity of the railroad operations support facilities. Fugitive dust emissions from construction-vehicle traffic on unpaved roads, surface disturbance (such as grading, scraping, bulldozing, wind erosion, and quarry excavation activities), and operation of concrete batch plants could cause unavoidable temporary impacts to air quality that, although within permissible limits, could not be completely mitigated. Table 4-53 in Section 4.2.4 summarizes impacts to air quality, which are projected to be small during both construction and operation, with the possible exception in the vicinity of the South Reveille Valley quarry.

Therefore, any impacts to air quality, although unavoidable, would be small.

8.1.1.5 Surface-Water Resources

Regrading, cut and fill activities, and structures such as box ***culverts*** would cause localized changes in drainage patterns throughout the rail line construction right-of-way. Construction of the proposed ***Staging Yard*** and ***Interchange Yard***, whether along the Caliente or Eccles alternative segment, would require channelization of natural drainage surface waters to keep water out of railroad operations support facility sites. Changes in drainage patterns could result in changes in erosion and sedimentation rates or locations. Construction in ***washes*** or other flood-prone areas could reduce the area through which floodwaters naturally flow, resulting in water buildup or ponding on the upstream side of crossings during floods that would slowly drain through the culverts or bridges.

DOE evaluated potential impacts to surface waters by identifying areas where there are drainage channels or water resources. While some changes would be unavoidable, DOE would take steps to ensure the alterations to natural drainage, sedimentation, and erosion would not increase future flood damage, increase the impact of floods on human health and safety, or cause identifiable harm to the functions and values of ***floodplains***. Because hydraulic structures and conveyance systems would be designed to safely convey 50-year or 100-year design storms and minimize concentration of flow, impacts associated with drainage conveyance would be small. The Department would minimize impacts to surface-water resources through the implementation of engineering design standards and best management practices that include erosion control measures. The Caliente alternative segment is adjacent to ***wetlands*** and some wetland fill would be unavoidable. Approximately 0.09 square kilometer (22 acres) of wetlands would be filled to construct the potential quarry siding. Construction of the Staging Yard in Indian Cove would require filling an area of wetlands and in the loss of approximately 0.19 square kilometer (47 acres) of wetland habitat. The Eccles alternative segment Interchange Yard would require portions of Clover Creek to be filled to elevate the site out of the floodplain. The total area to be filled within the confines of Clover Creek would be approximately 0.033 square kilometer (8.2 acres). DOE would minimize adverse impacts to wetlands (and the functions served by wetlands) and other surface-water resources.

8.1.1.6 Groundwater Resources

Withdrawal of ***groundwater*** from multiple wells for construction of the proposed railroad could cause a short-term decrease in groundwater resources resulting from increased ***demand*** on the host ***aquifer*** at each new well location. Groundwater withdrawal could decrease the amount of water available to a nearby existing well or spring discharge, and/or, in theory, decrease the amount of water available for underflow to a downgradient basin. The impacts of groundwater withdrawals from the proposed water-supply wells at the range of production rates that would be required for the railroad would be localized in nature, small in magnitude compared to existing groundwater inventories, and primarily temporary. Impacts analysis results indicate that short-term withdrawal of water from new water wells at the proposed withdrawal rates could, in some instances, if unmitigated, have some unavoidable impact on existing wells or springs. In those instances, mitigation measures are proposed, such as use of a staggered pumping schedule for the new well, or pumping the new well at a reduced rate over a longer time period, in order to minimize or prevent such impacts on existing groundwater users and uses. Over time, because the amount of groundwater withdrawn represents a fractionally small percentage of the available groundwater in storage, and the withdrawals would be limited primarily to the construction phase, DOE anticipated that this water would be replenished through the natural water cycle following the construction phase. Some of the water used for compaction would return to groundwater aquifers. For these reasons, DOE expects that there would be no adverse ***long-term impacts*** to existing groundwater resources.

8.1.1.7 Biological Resources

There could be unavoidable, short-term, adverse impacts to wildlife, special status species, protected game species, and wild horses and burros. There would be the potential for unavoidable impacts to ***threatened or endangered species*** during rail line construction. Potential impacts to desert tortoise would be moderate because of fragmentation of habitat. There could be localized and minor loss of roosting and foraging habitat for the southwestern willow flycatcher and western yellow-billed cuckoo.

DOE determined that there would be unavoidable impacts to wetlands and ***riparian*** habitats from construction of the Caliente alternative segment and either of the potential Staging Yard locations (Indian Cove and Upland), and the Eccles alternative segment. Unavoidable impacts to wildlife and wild horses and burros from the operation of the rail line could result from collisions of wildlife with trains and short-term disruption of activities (such as foraging, nesting, and resting). Although such impacts would be unavoidable, long-term impacts would be small. Other unavoidable impacts could include possible changes to predator/prey interactions due to the construction of towers and other structures that would provide new perch habitat for raptors and other predatory birds.

There could be some unavoidable impacts to special status wildlife or plant species. For example, project activities could result in small but unavoidable adverse impacts to:

- Non-critical habitat for the federally threatened Mojave population of the desert tortoise (*Gopherus agassizii*)
- Habitat for the BLM-designated sensitive southwestern toad (*Bufo microscaphus*) near Caliente and Meadow Valley Wash
- Individual BLM-designated sensitive plants and their habitats, including the Schlesser pincushion (*Sclerocactus schlesseri*) and the White River catseye (*Cryptantha welshii*) along Caliente common segment 1; Eastwood milkweed (*Asclepias eastwoodiana*) near Caliente common segment 3; and the Nevada dune beardtongue (*Penstemon arenarius*) along common segment 5
- Habit for the Chuckwalla lizard (*Sauromalus ater*) documented in the southeastern foothills of Yucca Mountain, adjacent to common segment 6

Nevertheless, DOE has concluded that there would be a small loss of habitats, and potential loss of wildlife from trains and construction traffic would be low. Although such impacts would be unavoidable, long-term impacts would be small.

8.1.1.8 Noise and Vibration

Railroad operations along the Caliente rail alignment would lead to an unavoidable increase in ***ambient noise*** from passing trains in areas of Nevada that are mostly uninhabited. Noise from trains might be noticeable as new noise in residential areas near the rail line in Caliente and Goldfield. Because there is already a substantial amount of train activity in Caliente, additional train noise would be less noticeable there than in other areas where there is no train activity and no train noise at present. DOE estimated noise levels during the operations phase at all sensitive receptor locations along the Caliente rail alignment and found they would be below Surface Transportation Board environmental review criteria for noise analysis. Therefore, DOE has determined that no long-term adverse noise impacts would be expected during railroad operations along the Caliente rail alignment. However, during rail line construction, DOE estimated that noise levels at certain receptor locations near the City of Caliente would be higher than Federal Transit Administration construction noise guidelines. This unavoidable impact would be temporary.

8.1.1.9 Socioeconomics

Construction and operation of the proposed railroad along the Caliente rail alignment would unavoidably impact population, housing, employment, and public services in Lincoln, Nye, Esmeralda, and Clark Counties; traffic; and, to a small extent, local current agriculture, ranching, and mining activities.

Socioeconomic changes during the construction phase would include a brief elevation in project-related employment, temporary population increases, and immediate impact on existing levels of public services (health care, transportation, fire protection, and law enforcement) where construction activities were concentrated near communities. DOE determined that the greatest impacts would be economic, and although unavoidable, would be viewed as beneficial and not adverse. As outlined in Section 4.2.9, Socioeconomics, construction-related impacts in Lincoln, Esmeralda, and Nye Counties would result in small increases in peak employment, increases in ***real disposable income***, and increases in ***gross regional product***. The project would generate vehicle trips during facilities construction, both from the movement of materials and from workers traveling to and from the work sites. DOE analyzed highway ***level of service*** by looking at traffic volume in terms of design hour and peak hour flow during a 4- to 10-year construction phase, and determined that there would be some unavoidable impacts from construction of the ***Rail Equipment Maintenance Yard*** at Yucca Mountain to traffic on U.S. Highway 95 near the entrances to the ***Yucca Mountain Site***. This effect would degrade the level of service during peak traffic hours. However, this level would represent high density but stable traffic flow and constitute a small, but unavoidable, impact. This unavoidable impact would be temporary, lasting only as long as the construction phase (4 to 10 years, with the peak period limited to 2 years).

Impacts to traffic during railroad operations would be considerably lower than construction-related impacts. DOE determined that Rail Equipment Maintenance Yard operations would affect traffic on U.S. Highway 95 near the entrances to the Yucca Mountain Site. However, this level would represent high density but stable traffic flow, and constitute a small, but unavoidable, impact. Elsewhere, there would be no impacts or changes to highway levels of service during the railroad operations phase.

Socioeconomic changes during railroad operations would include increases in project-related employment (particularly associated with railroad operations support facilities); slight long-term population increases; moderate pressure on available housing, and fire-protection and health services in southern Nye County; and continued small impacts on mining, ranching, and agriculture. DOE determined that the greatest economic gains would arise in Lincoln County.

8.1.1.10 Occupational and Public Health and Safety

The possibility of nonradiological industrial hazards (such as exposure to physical hazards, chemicals, dust, and pathogens) causing injury or illness to workers during construction and operations would not be completely unavoidable. However, the potential for such impacts would be very small. DOE has estimated that there could be approximately two fatalities associated with all such hazards during construction and 50 years of railroad operations.

There could be radiological impacts to workers and the public from ***incident-free transportation*** and facility operations. While the impact would be very small, radiological impacts would not be completely unavoidable. DOE estimated that approximately 0.34 ***latent cancer fatality*** would result to workers from incident-free transportation and facility operations, and that approximately 1.4×10^{-4} latent ***cancer*** fatality would result to the public from incident-free transportation and facility operations.

There could be radiological impacts from rail ***accidents*** involving casks. Radiological impacts from accidents are estimated to result in less than one latent cancer fatality.

There could be radiological impacts from sabotage events involving casks. If a sabotage event occurred in a suburban area, the collective ***radiation dose*** to the population is estimated to be 1,800 ***person-rem***. The total latent cancer fatalities for people exposed during a sabotage event is estimated to be one.

By their very nature, roadway accidents are considered unavoidable; however, the projected number of roadway accidents that could be attributed to construction and operation of the proposed railroad would be very small. DOE assessed the potential transportation safety impacts of vehicle traffic on roadways associated with constructing and operating the rail line and facilities. DOE determined that there could be up to six fatalities on roadways for the 335 million vehicle-kilometers (200 million vehicle-miles) traveled over the construction phase, and up to eight fatalities on roadways for the 460 million vehicle-kilometers (288 million vehicle-miles) traveled during the 50-year operations phase.

Also by their nature, rail line accidents are considered unavoidable; however, the projected number of rail accidents that could be attributed to construction and operation of the railroad would be very small. DOE determined that there could be approximately one fatality associated with the construction and operations phases. DOE also assessed the potential transportation safety impacts of rail traffic on the rail line and at ***at-grade crossings*** during the construction and operations phases. The Department estimated that over the construction phase and 50-year operations phase, approximately 16 rail-related accidents could be expected to occur for the entire set of estimated train movements.

8.1.1.11 Utilities, Energy, and Materials

Some interfacing with existing utility rights-of-way, in particular electric utility lines, would be unavoidable. Temporary unavoidable impacts to utilities during the construction phase could include possible short-term service interruptions as service was switched from existing electric-power lines, telecommunication lines, and water pipelines to new lines crossing the proposed railroad, or to lines that were relocated to avoid railroad construction activities.

The two principal electric providers in the project region, Nevada Power Company and Sierra Pacific Power Company, can currently meet peak load demands of 5,800 megawatts and 1,900 megawatts, respectively, through generating capacity or power-purchase capabilities. In 2005, their electricity sales were estimated to be 19 million megawatt-hours and 8.8 million megawatts-hours, respectively. In addition, the smaller Valley Electric Association, Inc. and Lincoln County Power District No. 1 are local area power purchasers and resellers. Over the 4- to 10-year construction phase, the electrical power providers in the project region would have adequate generating capacity or power-purchase capabilities (see Section 3.2.11) to supply the project during peak demand without disrupting service to the providers' respective coverage areas. Therefore, although energy use would be unavoidable, anticipated electricity demand to meet construction and operations needs would be modest and would not adversely impact other regional needs for electric power.

As described in Section 4.2.11.2.1.3, DOE estimated that annual consumption of diesel fuel during the railroad construction phase would be 117 million liters (31 million gallons) (DIRS 182825-Nevada Rail Partners 2007, Appendix D, Table D-5b), which would represent 6.5 percent of diesel fuel used annually in Nevada. As described in Section 4.2.11.2.2.2, DOE estimated that over an anticipated 50-year operations lifecycle, 119 million liters (31.5 million gallons) of diesel fuel would be consumed and the annual consumption rate would peak at 4.3 million liters (1.1 million gallons) (DIRS 182825-Nevada Rail Partners 2007, Appendix D, Table D-5a), a rate which is less than 0.25 percent of the current annual vehicular diesel fuel usage in Nevada. Although the use of fuel would be unavoidable, its use during either construction or operations would not adversely affect the capacity of national and regional fuel producers and distributors.

The need for construction materials, primarily steel, concrete, and aggregate, would be unavoidable, but would represent a small fraction of available materials (see Table 4-135). The regional and national impacts of meeting such needs would be small. Materials needed during the operations phase would be much less than during the construction phase, remaining considerably below available capacity.

8.1.1.12 Hazardous Materials and Waste

The generation of some general ***solid wastes***, special wastes (construction debris, used tires, and other materials with specific management requirements), and hazardous materials would be unavoidable, primarily during the construction phase. DOE would handle all wastes in accordance with applicable regulations, and would implement best management practices and pollution prevention/waste minimization programs. As described in Section 4.2.12, DOE estimated that 2,300 metric tons (2,500 tons) per year of nonhazardous solid waste (for example, general household waste) would be generated during the construction phase, for a daily rate of about 6.3 metric tons (6.9 tons). Nonrecyclable wastes would be disposed of, which would raise the total amount disposed of in the four-county area of Lincoln, Nye, Esmeralda, and Clark by up to approximately 0.077 percent. In addition, DOE estimated that construction activities would generate approximately 4,020 metric tons (4,380 tons) of ***industrial and special wastes*** per year, for an approximate daily rate of 11 metric tons (12 tons), which would result in an increase of approximately 0.13 percent in waste receipt at local landfills.

DOE estimated that 190 metric tons (210 tons) per year or 0.51 metric ton (0.56 ton) per day of nonhazardous solid waste would be generated at railroad operations support facilities, which would raise the total amount disposed of in the four-county area by less than 0.01 percent. There would be ample disposal capacities to accept the small amounts of ***low-level radioactive wastes*** generated from the ***Cask Maintenance Facility*** of 3,200 to 7,900 cubic meters (113,000 to 280,000 cubic feet) over the 30- to 50-year lifetime of this project (DIRS 181425-MTS 2007, all).

Although the use of disposal facilities would be unavoidable, existing disposal facilities have ample capacity to handle all additional wastes.

8.1.1.13 Cultural Resources

Because of the length of the Caliente rail alignment and the complexity associated with engineering a feasible alignment, DOE used a phased cultural resource identification and evaluation approach, as described in 36 Code of Federal Regulations (CFR) 800.4(b)2, to identify specific cultural resources as is fully described in Section 4.2.13. DOE has surveyed approximately 20 percent of the area for cultural resources. Based on cultural resources already identified, it is reasonable to conclude that there may be undiscovered cultural resources in the Caliente region of influence. The number and extent of identified cultural resource sites throughout the Caliente rail alignment region of influence will continue to increase as more surveys and inventories of potentially disturbed land are completed.

Nevertheless, railroad construction could cause unavoidable disturbance or destruction of cultural resources. Disturbance or destruction could occur during ground-disturbing activities along the rail alignment, at quarries, along temporary access roads, at ***borrow sites***, at temporary ***construction camps***, and at railroad operations support facilities. During construction, larger numbers of workers in the vicinity of the construction camps could increase the potential for impacts to nearby cultural resources. Excavation and other construction-related ground-disturbing activities could unearth additional cultural materials that were either thought, based on previous archaeological surveys, to occur only at ground surface, or were previously undetected because they were completely underground.

Railroad construction and operation could also lead to unavoidable changes in cultural landscapes, such as changes to ***ethnographic***, rural historic, and historic viewscapes. Cultural landscapes include historic-period Western Shoshone villages and surrounding use areas in the Oasis Valley, the Goldfield area, and Stone Cabin and Reveille Valleys; early ranching operations in the Stone Cabin and Reveille Valleys, and the Mormon settlement of Meadow Wash Valley; and the Goldfield, Clifford, and Reveille Mining Districts.

DOE would further modify the rail alignment, as necessary, to avoid discovered cultural resources. Based on preliminary information and sample surveys, any impacts would likely range from small to moderate because of an extensive effort to avoid or mitigate them.

8.1.1.14 Paleontological Resources

As described in Section 4.2.14, there is a paleontological resource site approximately 4.8 to 8 kilometers (3 to 5 miles) south of where Caliente common segment 1 would cross Bennett Pass, but because of its distance from the rail line, there would be no impacts to the site. There are no other known paleontological resources at or near the remaining portions of the Caliente rail alignment, nor do these areas have a strong potential to contain important paleontological resources. While there could be a potential to uncover previously unknown ***fossils*** during railroad construction, DOE would consult with the BLM to develop appropriate measures to minimize damage to paleontological resources during project-related construction if fossils were found. DOE has not identified any unavoidable adverse impacts.

8.1.1.15 Environmental Justice

DOE determined that constructing and operating the proposed railroad along the Caliente rail alignment would not result in disproportionately high and adverse human health, environmental, ecological, or cultural impacts on ***minority populations***, low-income communities, or American Indian tribes from construction and operation of a railroad along the Caliente rail alignment. DOE has not identified impacts, unavoidable or otherwise, in the context of ***environmental justice***.

8.1.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Council on Environmental Quality regulations that implement the procedural requirements of the National Environmental Policy Act (NEPA) require consideration of "the relationship between short-term uses of man's ***environment*** and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). This includes using " ... all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generation of Americans" (NEPA, Section 101, 42 U.S.C. 4331).

This section discusses the short-term use of the environment and the maintenance of its long-term productivity. Chapter 4 provides more detailed discussions of the impacts and resource utilization associated with the Proposed Action and the Shared-Use Option. Construction and operation of the proposed railroad would require short-term uses of land and other resources. Any long-term loss of productivity in disturbed areas would be small. The land-cover types along the proposed rail alignment are widely distributed throughout the region of influence and any loss of vegetation in the disturbed area along the rail alignment would have little impact on the regional productivity of plants and animals. Future long-term land uses such as grazing or mining would not be precluded by the short-term use of the land for the proposed rail line. The relationships between short-term uses and long-term productivity would not be meaningfully altered if either the Proposed Action or Shared-Use Option were implemented, or by the selection of alternative segments within the Caliente rail alignment ***implementing alternative***.

Wetlands or waters that would be filled would not recover in the short term and long-term productivity would be lost permanently. To the extent practicable, DOE would minimize such fill by optimizing final engineering and design and use a minimum-width construction right-of-way whenever possible. Construction of the Staging Yard in Indian Cove would require filling an area of wetlands and in the resultant loss of approximately 0.19 square kilometer (47 acres) of wetland habitat. There would be a long-term loss of productivity to riparian habitats from construction of the Caliente alternative segment and either of the potential Staging Yard locations (Indian Cove and Upland), and the Eccles alternative segment. The Eccles alternative segment Interchange Yard would require portions of Clover Creek to be filled to elevate the site out of a floodplain. The total area to be filled within the confines of Clover Creek would be approximately 0.033 square kilometer (8.2 acres).

Productivity loss for soils should be limited to the disturbed areas affected by land clearing, grading, and construction. Most disturbed areas not permanently maintained for railroad operations would recover over time, although recovery and a return to natural productivity could be slow for disturbed biological communities in an ***arid*** environment. DOE would revegetate disturbed areas with appropriate native species. Potentially productive soils characterized as prime farmland along Caliente common segment 1 and the Caliente and Eccles alternative segments are found only in isolated pockets and cannot support farming. Therefore, the minimal loss of these soils would not impact long-term productivity.

The areas used for temporary construction camps would likely recover in the short term.because they would be unused after construction activities ceased. DOE would implement restoration activities to encourage natural vegetation to grow on these sites. The Department might eventually abandon the proposed railroad and its operations support facilities, although it is unlikely that the rail ***roadbed*** would ever be completely dismantled. The proposed railroad and these facilities could be turned over to commercial carriers, especially if the Shared-Use Option were selected, and could continue to aid economic productivity in the region. Under the Shared-Use Option, the proposed railroad could increase transportation opportunities and lower transportation costs in the region.

The short-term withdrawal of water from the temporary construction wells could have a small impact on groundwater availability. However, DOE has projected that drawdowns would be sufficiently small to preclude impacts on flow rates or discharge rates at existing productive water-supply wells or springs. There would be no long-term impacts to groundwater resource productivity because the construction wells would only be used for a short time.

8.1.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA Section 102 (42 U.S.C. 4332) and Council on Environmental Quality regulations that implement the procedural requirements of NEPA (40 CFR 1502.16) require that environmental analyses include identification of: "... any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." An irreversible commitment of resources represents a loss of future options. It applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those factors that are renewable only over long time spans, such as soil productivity, whereas an irretrievable commitment of resources represents opportunities that are foregone for the period of the proposed action. Examples include the loss of production, harvest, or use of renewable resources. The decision to commit the resources is reversible, but the utilization opportunities foregone are irretrievable.

This section describes irreversible and irretrievable commitments of resources associated with implementation of the Proposed Action along the Caliente rail alignment. Sections 8.1.3.1 to 8.1.3.15 discuss resource commitments that could be irreversible and irretrievable. Irreversible and irretrievable commitments of resources would not meaningfully vary among alternative segments along the Caliente rail alignment, or by implementation of the Shared-Use Option.

8.1.3.1 Physical Setting

Construction of the rail line and construction and operations support facilities along the Caliente rail alignment could displace mineral deposits. Perlite is a locally important mineral that occurs in the area of the Caliente and Eccles alternative segments. Although no minerals would be removed, placement of the rail line could displace perlite and reduce its availability for mining, if there was perlite within the construction right-of-way. The Goldfield alternative segments would cross mining areas and could displace minerals or limit the boundaries for mining if mineral resources extend under the rail alignment. If these circumstances occurred and options for future use of minerals were limited, there would be an irreversible commitment of resources.

8.1.3.2 Land Use and Ownership

Construction and operation of the proposed railroad would require the commitment of land for placement of the rail line, construction and operations support facilities, and access roads. If at a future date DOE were to abandon the railroad, although much of the construction material might be removed, it is not likely that all of the natural landscape would be restored, and some of the land commitment would remain irreversible. Following abandonment of the rail line, lands along the Caliente rail alignment would be relinquished back to the BLM. If DOE had to acquire private lands for the Staging Yard at either of the Caliente options (Upland or Indian Cove), the Department would dispose of purchased land pursuant to DOE Order O 430.1B, *Real Property Asset Management*, or would return leased land to the lessee.

8.1.3.3 Aesthetic Resources

DOE determined that the visual impacts of operating trains would range from no visual contrast to strong visual contrast, and that the long-term visual impacts of marks on rock, soil, and vegetated landscape from cuts, fills, well pads, and access roads would range from weak to strong (with mitigation in Garden Valley) (see Section 4.2.3). The railroad would remain consistent with BLM visual resource management objectives where areas of high visual value are managed to minimize contrast levels, and areas of lower visual value are allowed higher contrast levels. Where land commitment was irreversible, aesthetic impacts would sometimes remain irreversible.

8.1.3.4 Air Quality

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Caliente rail alignment.

8.1.3.5 Surface-Water Resources

The Caliente alternative segment is adjacent to wetlands and some wetland fill would be unavoidable. This could result in an irretrievable commitment of resources along the Caliente rail alignment. Approximately 0.09 square kilometer (22 acres) of wetlands would be filled to construct the potential quarry siding. Construction of the Staging Yard in Indian Cove would require filling an area of wetlands and in the resultant loss of approximately 0.19 square kilometer (47 acres) of wetland habitat. The Eccles alternative segment Interchange Yard would require portions of Clover Creek to be filled to elevate the site out of the floodplain. The total area to be filled within the confines of Clover Creek would be approximately 0.033 square kilometer (8.2 acres).

8.1.3.6 Groundwater Resources

DOE estimated that a total of 7.52 billion cubic meters (6,100 ***acre-feet***) of water would be required for railroad construction (DIRS 180875-Nevada Rail Partners 2007, Section 4.4.2, pp. 4 to 10), most of which would be obtained through the construction of new water wells. Over time, because the amount of groundwater withdrawn represents a fractionally small percentage of the available groundwater in storage, and the withdrawals would be limited primarily to the railroad construction period, it is anticipated that this water would be replenished through the natural water cycle following the railroad construction phase. The use of groundwater could be considered as an irretrievable commitment of resources during the construction phase.

8.1.3.7 Biological Resources

The areas that would be occupied by the rail line, railroad construction and operations support facilities, and access roads would be irreversibly removed from natural habitat for the life of the proposed railroad. In addition, the disturbances of the desert soil surfaces in areas of temporary construction activity could result in changes that would be irreversible over the long term. The permanent conversion of vegetation resources and wildlife habitat along the rail line and at construction and operations support facilities could represent an irreversible commitment of biological resources for the life of the proposed railroad and beyond if, following abandonment, DOE did not restore these resources, or if former vegetation cover and composition did not recover. Losses of wildlife during railroad construction and operations would represent an irretrievable commitment of biological resources.

Impacts to wetlands and riparian habitats from construction of the Caliente alternative segment and either of the potential Staging Yard locations (Indian Cove and Upland), the Eccles alternative segment, and the Interchange Yard could represent an irreversible rather than irretrievable commitment of resources if, following abandonment, DOE did not restore these resources. However, during rail line final design, DOE would make adjustments to minimize such impacts.

8.1.3.8 Noise and Vibration

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Caliente rail alignment.

8.1.3.9 Socioeconomics

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Caliente rail alignment.

8.1.3.10 Occupational and Public Health and Safety

As discussed in Section 8.1.1.10, nonradiological industrial hazards (such as exposure to chemicals, dust, and pathogens) could cause injury or illness to workers during railroad construction and operations; however, DOE estimated the ***risk*** as approximately two fatalities. Radiological impacts to workers (0.34 latent cancer fatality) and the general public (1.4×10^{-4} latent cancer fatality) could occur from incident-free transportation, and DOE assessed the potential transportation safety impacts of movement on roadways, the rail line, at railroad operations support facilities, and at grade crossings associated with railroad construction and operation. DOE estimated there could be six vehicular-related fatalities during construction and approximately seven during operations. DOE estimated there could be approximately one rail-related fatality during construction and operations.

8.1.3.11 Utilities, Energy, and Materials

As described in Section 4.2.11, DOE estimated that annual consumption of diesel fuel during the construction phase would be 117 million liters (31 million gallons) (DIRS 182825-Nevada Rail Partners 2007, Appendix D, Table D-5b). Over an anticipated 50-year operations lifecycle, 119 million liters (31.5 million gallons) of diesel fuel would be consumed, and if the Shared-Use Option was implemented during the operations period, a total of 392 million liters (103.5 million gallons) would be consumed (DIRS 182825-Nevada Rail Partners 2007, Appendix D, Table D-5a). Fossil fuel consumed would be irreversible, and any portion of fuel consumed that was bio-fuel would be considered irretrievable. DOE has established an 8-megawatt power requirement (which includes a 30-percent reserve) for the Rail Equipment Maintenance Yard and Cask Maintenance Facility (DIRS 181033-Hamilton-Ray 2007, all). Fossil fuel or nuclear resources that generated that electricity would be irreversible.

As described in Section 4.2.11, construction of the railroad would require an estimated 82,000 metric tons (90,000 tons) of steel and 450,000 metric tons (496,000 tons) of concrete. Approximately 1,020,000 concrete railroad ties would be required for track construction. The estimated requirement for railroad ***ballast*** would be approximately 3.2 million metric tons (3.5 million tons), and approximately 2.7 million metric tons (3 million tons) for ***subballast*** (DIRS 180875-Nevada Rail Partners, Section 3.1.1, p. 3-1). Use of these materials would not be considered an irretrievable commitment of resources, because they could be recovered and recycled if DOE eventually abandoned the rail line.

8.1.3.12 Hazardous Materials and Waste

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Caliente rail alignment, other than the irreversible loss of land used for landfills.

8.1.3.13 Cultural Resources

Cultural resources (archeological, historical, and ethnographic) are nonrenewable resources and any loss would be irreversible. At this time DOE cannot fully characterize potential effects on cultural resources along the Caliente rail alignment or the magnitude of these effects.

8.1.3.14 Paleontological Resources

At this time DOE has not identified any impacts to paleontological resources along the Caliente rail alignment, but any impact that could occur would be irreversible.

8.1.3.15 Environmental Justice

DOE determined that constructing and operating the proposed railroad along the Caliente rail alignment would not cause high or adverse impacts to or fall disproportionately on minority or ***low-income populations***. Thus, DOE did not identify any associated irreversible and irretrievable commitments of resources along the Caliente rail alignment that would present an environmental justice concern.

8.2 Mina Rail Alignment

During the engineering and site evaluation and planning phase for the proposed railroad, DOE considered many factors to avoid or minimize potential environmental impacts (see Chapter 2), and would continue to consider these factors during the final design phase. DOE would meet all applicable regulatory requirements during proposed railroad construction and operations along the Mina rail alignment, and would implement an array of best management practices to ensure compliance with requirements (see Chapter 7, Best Management Practices and Mitigation). Also as described in Chapter 7, DOE could implement measures to mitigate any impacts remaining after final design and compliance with regulatory requirements and implementation of best management practices.

However, there could be unavoidable adverse impacts; impacts to short-term uses and long-term productivity resources; and/or irreversible and irretrievable commitment of resources, for example:

- DOE could mitigate most potential impacts described in Chapter 4, but there would be some unavoidable impacts, for example, on the use of grazing land.
- Railroad construction would involve ground-disturbing activities that would result in localized short-term impacts to soil, water use, and habitat. These resources would recover over time, and long-term productivity would not be affected.
- An irreversible commitment of resources such as consumption of fossil fuel, and an irretrievable commitment such as a loss of habitat.

This chapter summarizes and consolidates information from Chapter 4, Environmental Impacts, and Chapter 7, Best Management Practices and Mitigation.

8.2.1 UNAVOIDABLE ADVERSE IMPACTS

Engineering and site evaluation and planning are the first steps in undertaking a proposed action. Next follows compliance with all laws, regulatory requirements, and stipulations and conditions of associated permits to minimize environmental and health-related impacts. Best management practices are implemented to maintain compliance with these requirements. Where analyses identify potential environmental impacts, mitigation measures are implemented to avoid, minimize, rectify, reduce, or compensate for those impacts. Finally, unavoidable adverse impacts may arise where there are no reasonably practicable mitigation measures to entirely eliminate impacts, and there are no reasonably practicable alternatives to the proposed project that would meet the purpose and need of the action, eliminate the impact, and not cause other or similar significant adverse impacts.

Unavoidable adverse impacts would not vary substantially among alternative segments along the Mina rail alignment, or by implementation of the Shared-Use Option. Sections 8.2.1.1 to 8.2.1.15 describe unavoidable adverse impacts, if any, for each environmental resource area evaluated in this Rail Alignment EIS.

8.2.1.1 Physical Setting

Construction of the proposed railroad along the Mina rail alignment would lead to permanent alterations in topography in the rail alignment construction right-of-way as a result of cuts and fills, and in the locations of potential quarry sites. Cuts and fills would also alter local drainage patterns, and would remain after a possible future abandonment of the rail line. Cuts and fills associated with construction of any of the alternative segments could result in the loss of topsoil, and an increased potential for erosion. No mineral deposits would be removed; nevertheless, a rail line could unavoidably restrict access to such deposits. Less than 1 percent of soils along the Mina alignment are classified as prime farmland. As required under the Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*), which directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands, DOE has coordinated with the Natural Resources Conservation Service to minimize any potential conversion of land classified as prime farmland to nonagricultural uses. Less than 0.1 percent of soils along the Mina rail alignment are classified as prime farmlands, all of which occur on the Walker River Paiute Reservation. There are 0.011 square kilometer (2.7 acres) of prime farmland along Schurz alternative segment 1, 0.012 square kilometer (3 acres) along Schurz alternative segment 4, and 0.014 square kilometer (3.5 acres) along each of Schurz alternative segments 5 and 6; at present these soils are not farmed. The Walker River Paiute Reservation contains approximately 5.5 square kilometers (1,400 acres) of prime farmland soils, thus, construction of the Mina rail alignment would remove less than 0.1 percent of prime farmland soils on the Reservation from possible future productive use. Construction activities within the construction right-of-way would result in local soil compaction, which could impact the natural revegetation rate and vegetation types over time.

Any permanent alterations in topography that could not be mitigated could be viewed as unavoidable adverse impacts. As described in Section 4.3.1.2.1, topographic impacts due to major cut-and-fill and other earthwork processes would occur primarily along the Montezuma alternative segments, specifically along Montezuma alternative segment 1. In addition, impacts from major cut-and-fill and other earthwork processes also would occur around the Calico Hills and Terrill Mountains, the Goldfield Hills, Beatty, and Yucca Mountain. As described in Section 4.3.1.2.1.1, the total area that would be disturbed during construction of the proposed rail line and construction and operations support facilities would range from approximately 40 to 48 square kilometers (9,900 to 12,000 acres). Tables 4-145 to 4-150 in Section 4.3.1 list specific amounts of disturbed surface areas for the Mina rail alignment alternative segments, common segments, and construction and operations support facilities. Any impacts to physical setting, although unavoidable, would be small.

8.2.1.2 Land Use and Ownership

Use of land along the Mina rail alignment for construction and operation of the proposed railroad would involve some long-term changes in land use. The land DOE would use for this project would be managed as a right-of-way grant obtained from the BLM. This would not pose a land-use conflict because the rights-of-way would not be in right-of-way avoidance areas. The BLM could establish land management requirements that provide for multiple use, but land used for the proposed rail line and construction and operations support facilities could limit certain other land uses. The multiple-use mandate set forth in the Federal Land Policy and Management Act would continue to apply to the public lands within the right-of-way, but railroad construction and operations could limit certain future land uses that pose a conflict.

Construction and operation of the proposed railroad along the Mina rail alignment would directly impact grazing allotments by transecting parcels and potentially hindering access to forage and water resources. Other potential impacts include allotments being reduced in size and a reduced ability of livestock, wild horses, and burros to range freely across grazing areas. Even with mitigation, some adverse impacts to the use of grazing land would be unavoidable. Tables 4-161 to 4-166 in Section 4.3.2 summarize potential impacts to land use and ownership for each alternative segment, common segment, and railroad construction and operations support facility.

Construction and operation of the proposed railroad would not displace existing or planned land uses over a large area or conflict with land-use plans or goals. Therefore, any impacts to land use and ownership, although unavoidable, would be small.

8.2.1.3 Aesthetic Resources

The region of influence for aesthetic resources is the viewshed around all Mina rail alignment alternative segments, common segments, and railroad construction and operations support facilities, and any additional sidings that would be added under the Shared-Use Option. Operation of the proposed railroad along the Mina rail alignment would remain consistent with BLM visual resource management objectives, under which areas of high visual value (Classes I and II) are managed to minimize contrast levels, and areas of lower visual value (Classes III and IV) are allowed higher contrast levels. There would be unavoidable visual changes associated with the proposed railroad. Contrast levels that were rated by DOE as none, weak, or moderate would be such that BLM visual resource management objectives would be met for BLM-administered lands and impacts would be comparable on non-BLM-administered land.

8.2.1.4 Air Quality

Construction and operation of the proposed rail line and operations support facilities along the Mina rail alignment would cause unavoidable emissions of some criteria air pollutants. However, air pollutant concentrations would not exceed National Ambient Air Quality Standards for construction or operation of the railroad and associated facilities, with the exception of the 24-hour standards for both particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}) and an aerodynamic diameter of 2.5 micrometers or less (***$PM_{2.5}$***) that DOE modeled as exceeded near the construction right-of-way at Mina and Schurz during the short (less than 6 months) construction period, and at the Staging Yard at Hawthorne and the potential Garfield Hills quarry. However, DOE will be required to obtain a Surface Area Disturbance Permit Dust Control Plan, issued by the State of Nevada, Department of Environmental Protection, prior to development of the quarry and construction of the Staging Yard. DOE anticipates that compliance with the requirements of this plan to reduce fugitive dust emissions would decrease the possibility of ***ambient air*** quality standards exceedances—for example, the requirement for cessation of all operations when winds make control of fugitive dust difficult (this was a mitigating attribute not accounted for in the modeling that DOE undertook). DOE could further reduce the possibility of exceeding the 24-hour standard for PM_{10} at a public boundary by acquiring additional land and moving public access farther away.

The highest increase in air pollutant emissions would occur during the construction phase, and the highest increase in air emissions from railroad operations would occur in the vicinity of the operations support facilities. The highest increase in criteria air pollutant emissions would be for ***nitrogen oxides*** in Esmeralda County during the construction phase, where emissions could be 3,570 metric tons (3,940 tons) per year higher than the 2002 county-wide emissions of nitrogen oxides. However, these emissions would be distributed over the entire length of the rail alignment in the county and no air quality standard would be exceeded. Fugitive dust emissions from construction-vehicle traffic on unpaved roads, surface disturbance (such as grading, scraping, bulldozing, wind erosion, and quarry excavation activities), and operation of concrete batch plants could cause unavoidable temporary impacts to air quality that, although within permissible limits, could not be completely mitigated. Table 4-198 in Section 4.3.4 summarizes impacts to air quality, which are projected to be small during both construction and operation, except temporarily during construction near the construction right-of-way at Mina and Schurz, the Staging Yard at Hawthorne, and the Garfield Hills quarry.

Therefore, any impacts to air quality, although unavoidable, would be small.

8.2.1.5 Surface-Water Resources

Regrading, cut and fill activities, and structures such as box culverts would cause localized changes in drainage patterns throughout the rail line construction right-of-way. Construction of the proposed Staging

Yard and Interchange Yard would require channelization of natural drainage surface waters to keep water out of railroad operations support facility sites. Changes in drainage patterns could result in changes in erosion and sedimentation rates or locations. Construction in washes or other flood-prone areas could reduce the area through which floodwaters naturally flow, resulting in water buildup or ponding on the upstream side of crossings during floods that would slowly drain through the culverts or bridges.

Temporary unavoidable impacts could occur from disturbance of about 0.002 square kilometer (0.55 acre) of wetlands along Schurz alternative segments 1 and 4, and 0.003 square kilometer (0.73 acre) of wetlands along Schurz alternative segments 5 and 6 during construction of a bridge at the Walker River crossing. Permanent fill or loss of wetlands would total about 20 square meters (0.005 acre) for emplacement of about 10 piers in wetlands for Schurz alternative segments 1 and 4, or 28 square meters (0.007 acre) for emplacement of about 14 piers for Schurz alternative segments 5 and 6.

DOE evaluated potential impacts to surface waters by identifying areas where there are drainage channels or other water resources. While some changes would be unavoidable, DOE would take steps to ensure the alterations to natural drainage, sedimentation, and erosion would not increase future flood damage, increase the impact of floods on human health and safety, or cause identifiable harm to the functions and values of floodplains. Because hydraulic structures and conveyance systems would be designed to safely convey 50-year or 100-year design storms and minimize concentration of flow, impacts associated with drainage conveyance would be small. The Department would minimize impacts to surface-water resources through the implementation of engineering design standards and best management practices that include erosion control measures.

Therefore, any impacts to surface-water resources, although unavoidable, would be small.

8.2.1.6 Groundwater Resources

Withdrawal of groundwater from multiple wells for construction of the proposed railroad could cause a short-term decrease in groundwater resources resulting from increased demand on the host aquifer at each new well location. Groundwater withdrawal could decrease the amount of water available to a nearby existing well or spring discharge, and/or, in theory, decrease the amount of water available for underflow to a downgradient basin. The impacts of groundwater withdrawals from the proposed water-supply wells at the range of production rates that would be required for the rail line would be localized in nature, small in magnitude compared to existing groundwater inventories, and primarily temporary. Impacts analysis results indicate that short-term withdrawal of water from new water wells at the proposed withdrawal rates could, in some instances, if unmitigated, have some unavoidable impact on existing wells or springs. In those instances, mitigation measures are proposed, such as use of a staggered pumping schedule for the new well, or pumping the new well at a reduced rate over a longer time period, in order to minimize or prevent such impacts on existing groundwater users and uses. Over time, because the amount of groundwater withdrawn represents a fractionally small percentage of the available groundwater in storage, and the withdrawals would be limited primarily to the construction phase, DOE anticipated that this water would be replenished through the natural water cycle following the construction phase. Some of the water used for compaction would return to groundwater aquifers. For these reasons, DOE expects that there would be no adverse long-term impacts to existing groundwater resources.

8.2.1.7 Biological Resources

There could be unavoidable, short-term, adverse impacts to wildlife, special status species, protected game species, and wild horses and burros. There would be the potential for unavoidable impacts to threatened or endangered species during the construction phase. Potential impacts to desert tortoise would be moderate because of fragmentation of habitat. There would be the potential for impacts to threatened or endangered species during construction. Unavoidable impacts to wildlife and wild horses and burros from railroad operations would consist of potential collisions of wildlife with trains and short-term disruption of activities (such as foraging, nesting, and resting). Other unavoidable impacts could include possible changes to predator/prey interactions due to the construction of towers and other structures that would provide new perch habitat for raptors and other predatory birds.

There could be some unavoidable impacts to special status wildlife or plant species. For example, project activities could result in small to moderate but unavoidable adverse impacts to:

- Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), as a result of construction of a bridge crossing the Walker River
- Non-critical habitat for the federally threatened Mojave population of the desert tortoise (*Gopherus agassizii*)
- Western snowy plover (*Charadrius alexandrinus nivosus)* along Mina common segment 1
- Northern goshawk (*Accipiter gentilis*) and Ferruginous hawk (*Buteo regalis*) along Montezuma 1, 2, and 3 and the potential North Clayton quarry

Nevertheless, DOE has concluded that there would be a small loss of habitats, and potential deaths of wildlife from trains and construction traffic would be low. Although such impacts would be unavoidable, long-term impacts would be small.

Construction of additional access roads would make ***herd management areas*** more accessible, which would then indirectly, but unavoidably, increase the loss of wild horses, burros, and desert tortoises from human interaction. However, DOE has determined that such impacts would be small and would have a small impact on management strategies within herd management areas. The overall ***indirect impact*** would be small.

8.2.1.8 Noise and Vibration

Railroad operations along the Mina rail alignment would lead to an unavoidable increase in ambient noise from passing trains in areas of Nevada that are mostly uninhabited. Noise from trains might be noticeable as new noise in residential areas near the rail line in Silver Springs, Silver Peak, Mina, and Goldfield. Because there is already some train activity in Silver Springs, additional train noise would be less noticeable there than in other areas where there is no train activity and no train noise at present. DOE estimated noise levels during the operations phase at all sensitive receptor locations along the Mina rail alignment, and found they would be below Surface Transportation Board noise impact criterion. Therefore, DOE has determined that no long-term adverse noise impacts would be expected during railroad operations along the Mina rail alignment. However, during the construction phase, DOE estimated that noise levels at certain receptor locations would be higher than Federal Transit Administration construction noise guidelines. This unavoidable impact would be temporary.

8.2.1.9 Socioeconomics

Construction and operation of the proposed railroad along the Mina rail alignment would unavoidably impact population, housing, employment, and public services in Lyon, Mineral, Esmeralda, Nye, and Clark Counties; traffic; and, to a small extent, local current agriculture, ranching, and mining activities.

Socioeconomic changes during the construction phase would include a brief elevation in project-related employment, temporary population increases, and immediate impact on existing levels of public services (health care, transportation, fire protection, and law enforcement) where construction activities were concentrated near communities. DOE determined that the greatest impacts would be economic, and although unavoidable, would be viewed as beneficial and not adverse. As outlined in Section 4.3.9, DOE demonstrated that construction-related impacts in Lyon, Mineral, Esmeralda, and Nye Counties would result in small increases in peak employment, increases in real disposable income, and increases in gross regional product. The project would generate vehicle trips during facilities construction, both from the movement of materials and from workers traveling to and from the work sites. DOE analyzed highway level of service by looking at traffic volume in terms of the peak hour flow during a 4- to 10- year construction period. DOE determined that there would be some unavoidable impacts from construction of the Rail Equipment Maintenance Yard and Cask Maintenance Facility at Yucca Mountain to traffic on U.S. Highway 95 near the entrances to the Yucca Mountain Site. This effect would degrade the level of service during peak traffic hours. However, this level would represent high density but stable traffic flow and constitute a small, but unavoidable, impact. This unavoidable impact would be temporary, lasting only as long as the construction phase (4 to 10 years, with the peak period limited to 2 years).

Impacts to traffic during railroad operations would be considerably lower than construction-related impacts. DOE determined that Rail Equipment Maintenance Yard operations would affect traffic on U.S. Highway 95 near the entrances to the Nevada Test Site; however, this level would represent high density but stable traffic flow, and constitute a small, but unavoidable, impact. Elsewhere, there would be no impacts or changes to highway levels of service during the operations phase.

Socioeconomic changes during the operations phase would include increases in project-related employment (particularly associated with railroad operations support facilities); slight long-term population increases; moderate pressure on available housing, and fire-protection and health services in southern Nye County; and continued small impacts on mining, ranching and agriculture. DOE determined that the greatest economic gains would arise in Mineral, Esmeralda, and Nye Counties.

8.2.1.10 Occupational and Public Health and Safety

The possibility of nonradiological industrial hazards (such as exposure to physical hazards, chemicals, dust, and pathogens) causing injury or illness to workers during construction and operations would not be completely unavoidable. However, the potential for such impacts would be very small. DOE has estimated that there could be approximately two fatalities associated with all such hazards during rail line and facility construction and 50 years of railroad operations.

There could be radiological impacts to workers and the public from incident-free transportation and facility operations. While the impact would be very small, radiological impacts would not be completely unavoidable. DOE estimated that approximately 0.35 latent cancer fatality could result to workers from incident-free transportation and facility operations, and that approximately 8.5×10^{-4} latent cancer fatality could result to the public from incident-free transportation and facility operations.

There could be radiological impacts from rail accidents involving casks. Radiological impacts from accidents are estimated to result in less than one latent cancer fatality.

There could be radiological impacts from sabotage events involving casks. If a sabotage event occurred in a suburban area, the collective radiation dose to the population is estimated to be 4,700 person-rem. The total latent cancer fatalities for people exposed during a sabotage event is estimated to be three.

By their nature, roadway accidents are considered unavoidable; however, the projected number of roadway accidents that could be attributed to construction and operation of the proposed rail line and facilities would be very small. DOE assessed the potential transportation safety impacts of vehicle traffic on roadways associated with constructing and operating the rail line and facilities. DOE determined that there could be six fatalities on roadways for the 315 million vehicle-kilometers (190 million vehicle-miles) traveled over the construction period, and seven fatalities on roadways for the 420 million vehicle-kilometers (263 million vehicle-miles) traveled during the 50-year operations phase.

Also by their nature, railway accidents are considered unavoidable; however, the projected number of rail accidents that could be attributed to construction and operation of the rail line and facilities would be very small. DOE determined that there could be approximately one fatality associated with the construction and operations phases. DOE also assessed the potential transportation safety impacts of rail traffic on the rail line and at at-grade crossings during the operations phase. The Department estimated that over the 50-year operations phase, 16 rail-related accidents could be expected to occur for the entire set of estimated train movements.

8.2.1.11 Utilities, Energy, and Materials

Some interfacing with existing utility rights-of-way, in particular electric utility lines, would be unavoidable. Temporary unavoidable impacts to utilities during the construction phase could include possible short-term service interruptions as service was switched from existing electric-power lines, telecommunication lines, and water pipelines to new lines crossing the rail line, or to lines that were relocated to avoid railroad construction activities.

The two principal electric providers in the project region, Nevada Power Company and Sierra Pacific Power Company, can currently meet peak load demands of 5,800 megawatts and 1,900 megawatts, respectively, through generating capacity or power-purchase capabilities. In 2005, their electricity sales were estimated to be 19 million megawatt-hours and 8.8 million megawatts, respectively. In addition, the smaller Valley Electric Association, Inc., is a local area power purchaser and reseller. Over the 4- to 10-year construction phase, the electrical power providers in the project region would have adequate generating capacity or power-purchase capabilities (see Section 3.3.11) to supply the project during peak demand without disrupting service to the providers' respective coverage areas. Therefore, although energy use would be unavoidable, anticipated electricity demand to meet construction and operations needs would be modest and would not adversely impact other regional needs for electric power.

As described in Section 4.3.11.2.1.3, DOE estimated that annual consumption of diesel fuel during the construction phase would be 109 million liters (28.8 million gallons), which would represent 6 percent of diesel fuel used annually in Nevada (DIRS 180874- Nevada Rail Partners 2007, Appendix D, Table D-5b). As described in Section 4.3.11.2.2.2, DOE estimated that over an anticipated 50-year operations lifecycle, 119 million liters (31.5 million gallons) of diesel fuel would be consumed, and the annual consumption rate would peak at 4.3 million liters (1.1 million gallons), a rate which is less than 0.25 percent of the current annual vehicular diesel fuel usage in Nevada. Although the use of fuel would be unavoidable, its use during either construction or operations would not adversely affect the capacity of national and regional fuel producers and distributors.

The need for construction materials, primarily steel, concrete, and aggregate, would be unavoidable, but would represent a small fraction of available materials (see Table 4-284). The regional and national impacts of meeting such needs would be small. Materials needed during the operations phase would be much less than during the construction phase, remaining considerably below available capacity, and impacts would not be adverse.

8.2.1.12 Hazardous Materials and Waste

The generation of some general solid wastes, special wastes (construction debris, used tires, and other materials with specific management requirements), and hazardous materials would be unavoidable, primarily during railroad construction. DOE would handle all wastes in accordance with applicable regulations, and would implement best management practices and pollution prevention/waste minimization programs. As described in Section 4.3.12, DOE estimated that 2,300 metric tons (2,500 tons) per year of nonhazardous solid waste (such as general household waste) would be generated during the construction phase, for a daily rate of about 6.3 metric tons (6.9 tons). Nonrecyclable wastes would be disposed of, which would raise the total amount disposed of in the four-county area of Mineral, Nye, Esmeralda, and Clark Counties by approximately 0.077 percent. In addition, DOE estimated that construction activities would generate approximately 12,000 metric tons (13,100 tons) of industrial and special wastes per year, for an approximate daily rate of 33 metric tons (36 tons), which would result in an increase of approximately 0.41 percent in waste receipt to local landfills.

DOE estimated that 170 metric tons (190 tons) per year or 0.45 metric tons (0.5 tons) per day of nonhazardous solid waste would be generated at railroad operations support facilities, which would raise the total amount disposed of in the four-county area by less than 0.01 percent. There would be ample disposal capacities to accept the small amounts generated of low-level radioactive wastes from the Cask Maintenance Facility of 3,200 to 7,900 cubic meters (113,000 to 280,000 cubic feet) over the 30- to 50-year lifetime of this project (DIRS 181425-MTS 2007, Table 2).

Although the use of disposal facilities would be unavoidable, existing disposal facilities have ample capacity to handle all additional wastes.

8.2.1.13 Cultural Resources

Because of the length of the Mina rail alignment and the complexity associated with engineering a feasible alignment, DOE used a phased cultural resource identification and evaluation approach, as described in 36 CFR 800.4(b)2, to identify specific cultural resources as is fully described in Section 4.3.13. DOE has surveyed approximately 20 percent of the area for cultural resources. Based on cultural resources already identified, it is reasonable to conclude that there may be undiscovered cultural resources in the Mina region of influence. The number and extent of identified cultural resource sites throughout the Mina rail alignment region of influence will continue to increase as more surveys and inventories of potentially disturbed land are completed.

Nevertheless, construction activities could cause unavoidable disturbance or destruction of cultural resources. Disturbance or destruction could occur during ground-disturbing activities along the Mina rail alignment, at quarries, along temporary access roads, at borrow sites, at temporary construction camps, and at railroad operations support facilities. During construction, larger numbers of workers in the vicinity of the construction camps could increase the potential for impacts to nearby cultural resources. Excavation and other construction-related ground-disturbing activities could unearth additional cultural materials that were either thought, based on previous archaeological surveys, to occur only at ground surface, or were previously undetected because they were completely underground.

Railroad construction and operation could also lead to unavoidable changes in cultural landscapes, such as changes to ethnographic, rural historic, and historic viewscapes. Cultural landscapes include historic-period Northern Paiute use of the Walker River and Walker Lake areas; historic-period Western Shoshone villages and surrounding use areas in the Oasis Valley and Goldfield areas; and historic mining in the Luning, Mina, and Goldfield districts.

DOE would further modify the rail alignment, as necessary, to avoid discovered cultural resources. Based on preliminary information and sample surveys, any impacts would likely range from small to moderate because of an extensive effort to avoid or mitigate them.

8.2.1.14 Paleontological Resources

DOE has not identified paleontological resources at or close to the Mina rail alignment, nor do these areas have a strong potential to contain important paleontological resources. While there could be a potential to uncover previously unknown fossils during railroad construction, DOE would consult with the BLM to develop appropriate measures to minimize damage to paleontological resources during project-related construction if fossils were found. DOE has not identified any unavoidable adverse impacts.

8.2.1.15 Environmental Justice

DOE determined that constructing and operating the proposed railroad along the Mina rail alignment would not result in disproportionately high and adverse human health, environmental, ecological, or cultural impacts on minority populations, low-income communities, or American Indian tribes from construction and operation of a rail line along the Mina rail alignment. DOE has not identified impacts, unavoidable or otherwise, in the context of environmental justice.

8.2.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Council on Environmental Quality regulations that implement the procedural requirements of NEPA require consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). This includes using " ... all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generation of Americans" (NEPA, Section 101, 42 U.S.C. 4331).

This section discusses the short-term use of the environment and the maintenance of its long-term productivity. Chapter 4 provides more detailed discussions of the impacts and resource utilization associated with the Proposed Action and the Shared-Use Option. Construction and operation of the proposed railroad would require short-term uses of land and other resources. Any long-term loss of productivity in disturbed areas would be small. The land-cover types along the proposed rail alignment are widely distributed throughout the region of influence and any loss of vegetation in the disturbed area along the rail alignment would have little impact on the regional productivity of plants and animals. Future long-term land uses such as grazing or mining would not be precluded by the short-term use of the land for the proposed rail line. The relationships between short-term uses and long-term productivity would not be meaningfully altered if either the Proposed Action or Shared-Use Option were implemented, or by the selection of alternative segments within the Mina corridor.

DOE anticipates temporary short-term disturbances of about 0.002 square kilometer (0.55 acre) of wetlands along Schurz alternative segments 1 and 4, and 0.003 square kilometer (0.73 acre) of wetlands along Schurz alternative segments 5 and 6 during construction of a bridge at the Walker River crossing. Permanent fill or loss of wetlands would total about 20 square meters (0.005 acre) for emplacement of about 10 piers in wetlands for Schurz alternative segments 1 and 4, or 28 square meters (0.007 acre) for emplacement of about 14 piers for Schurz alternative segments 5 and 6.

Productivity loss for soils should be limited to the disturbed areas impacted by land clearing, grading, and construction. Most disturbed areas not permanently maintained for railroad operations would recover over time, although recovery and a return to natural productivity could be slow for disturbed biological communities in an arid environment. DOE would revegetate disturbed areas with appropriate native species. DOE estimated a maximum of 14,000 square meters (3.5 acres) of potentially disturbed soils are characterized as prime farmland along the Schurz alternative segments and the minimal loss of these unfarmed soils would not impact long-term productivity.

The areas used for temporary construction camps would likely recover in the short-term because they would be unused after construction activities ceased. DOE would implement restoration activities to encourage natural vegetation to grow on these sites. The Department might eventually abandon the proposed rail line and its operations support facilities, although it is unlikely that the rail roadbed would ever be completely dismantled. The proposed rail line and these facilities could be turned over to commercial carriers, especially if the Shared-Use Option were selected, and could continue to aid economic productivity in the region. Under the Shared-Use Option, the proposed rail line could increase transportation opportunities and lower transportation costs in the region.

The short-term withdrawal of water from the temporary construction wells could have a small impact on groundwater availability. However, DOE has projected that drawdowns would be sufficiently small to preclude impacts on flow rates or discharge rates at existing productive water-supply wells or springs. There would be no long-term impacts to groundwater resource productivity because the construction wells would only be used for a short time.

8.2.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA Section 102 (42 U.S.C. 4332) and Council on Environmental Quality regulations that implement the procedural requirements of NEPA (40 CFR 1502.16) require that environmental analyses include identification of "... any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." An irreversible commitment of resources represents a loss of future options. It applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those factors that are renewable only over long time spans, such as soil productivity, whereas an irretrievable commitment of resources represents opportunities that are foregone for the period of the proposed action. Examples include the loss of production, harvest, or use of renewable resources. The decision to commit the resources is reversible, but the utilization opportunities foregone are irretrievable.

This section describes irreversible and irretrievable commitments of resources associated with implementation of the Proposed Action along the Mina rail alignment. Sections 8.2.3.1 to 8.2.3.15 discuss resource commitments that could be irreversible and irretrievable. Irreversible and irretrievable commitments of resources would not meaningfully vary among alternative segments along the Mina rail alignment, or by implementation of the Shared-Use Option.

8.2.3.1 Physical Setting

Construction of the rail line and railroad construction and operations support facilities along the Mina rail alignment could displace mineral deposits. Although no minerals would be removed, placement of the rail line could displace mineral deposits and reduce their availability for mining, if any were found within the construction right-of-way. If these circumstances occurred and options for future use of minerals were limited, there would be an irreversible commitment of resources.

8.2.3.2 Land Use and Ownership

Construction and operation of the proposed railroad would require the commitment of land for placement of the rail line, construction and operations support facilities, and access roads. If at a future date DOE were to abandon the railroad, although much of the construction material might be removed, it is not likely that all of the natural landscape would be restored, and some of the land commitment would remain irreversible. Following abandonment of the railroad, the appropriate lands along the Mina rail alignment would be relinquished back to the BLM, the Walker River Paiute Tribe, and Department of Defense at the Hawthorne Army Depot.

8.2.3.3 Aesthetic Resources

DOE determined that the visual impacts of operating trains would range from no visual contrast to strong visual contrast, and that the long-term visual impacts of marks on rock, soil, and vegetated landscape from cuts, fills, well pads, and access roads would range from weak to strong (see Section 4.3.3). The rail alignment would remain consistent with BLM visual resource management objectives where areas of high visual value are managed to minimize contrast levels, and areas of lower visual value are allowed higher contrast levels. Where land commitment was irreversible, aesthetic impacts would sometimes remain irreversible.

8.2.3.4 Air Quality

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Mina rail alignment.

8.2.3.5 Surface-Water Resources

Permanent fill or loss of wetlands would total about 20 square meters (0.005 acre) for emplacement of about 10 piers in wetlands for Schurz alternative segments 1 and 4, or 28 square meters (0.007 acre) for emplacement of about 14 piers for Schurz alternative segments 5 and 6. This could result in an irreversible commitment of resources.

8.2.3.6 Groundwater Resources

DOE estimated that a total of 7.3 billion cubic meters (5,900 acre-feet) of water would be required for railroad construction and operations, all of which DOE assumed would be obtained through the construction of new water wells. Although this water would be consumed, this would not be an irretrievable commitment. Over time, because the amount of groundwater withdrawn represents a fractionally small percentage of the available groundwater in storage, and the withdrawals would be limited primarily to the railroad construction period, it is anticipated that this water would be replenished through the natural water cycle following the railroad construction phase. Some of the water used for compaction would return to groundwater aquifers. For these reasons, it is expected that there would be no adverse long-term impacts to existing groundwater resources.

8.2.3.7 Biological Resources

The areas that would be occupied by the rail line, railroad construction and operations support facilities, and access roads would be irreversibly removed from natural habitat for the life of the proposed railroad. In addition, the disturbances of the desert soil surfaces in areas of temporary construction activity could result in changes that would be irreversible over the long term. The permanent conversion of vegetation resources and wildlife habitat along the rail line and at construction and operations support facilities could represent an irreversible commitment of biological resources for the life of the railroad and beyond if, following abandonment, DOE did not restore these resources, or if former vegetation cover and composition did not recover. Losses of wildlife during railroad construction and operations would represent an irretrievable commitment of biological resources.

8.2.3.8 Noise and Vibration

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Mina rail alignment.

8.2.3.9 Socioeconomics

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Mina rail alignment.

8.2.3.10 Occupational and Public Health and Safety

As discussed in Section 8.2.1.10, nonradiological industrial hazards (such as exposure to chemicals, dust, and pathogens) could cause injury or illness to workers during railroad construction and operations; however, DOE estimated the risk as approximately two fatalities. Radiological impacts to workers (0.35 latent cancer fatality) and the general public (8.5×10^{-4} latent cancer fatality) could occur from incident-free transportation, and DOE estimated the risk to be each less than one. DOE assessed the potential transportation safety impacts of movement on roadways, the rail line, at operations support facilities, and at grade crossings associated with railroad construction and operation. DOE estimated that there could be six vehicular-related fatalities during construction, seven vehicular-related fatalities during operations, and approximately one rail-related fatality during construction and operations.

8.2.3.11 Utilities, Energy, and Materials

As described in Section 4.3.11, DOE estimated that annual consumption of diesel fuel during the railroad construction phase would be 109 million liters (28.8 million gallons). Over an anticipated 50-year operations lifecycle, 119 million liters (31.5 million gallons) of diesel fuel would be consumed, and if the Shared-Use Option was implemented during the operations period, a total of 390 million liters (103.5 million gallons) would be consumed (DIRS 180874-Nevada Rail Partners 2007, Appendix D, Table D-5a). Fossil fuel consumed would be irreversible, and any portion of fuel consumed that was bio-fuel would be considered irretrievable. DOE has established an 8 megawatt power requirement (which includes a 30-percent reserve) for the Rail Equipment Maintenance Yard and Cask Maintenance Facility (DIRS 181033-Hamilton-Ray 2007, all). Fossil fuel or nuclear resources that generated that electricity would be irreversible.

As described in Section 4.3.11, railroad construction would require an estimated 63,000 metric tons (69,000 tons) of steel and 373,000 metric tons (411,000 tons) of concrete. Approximately 776,000 concrete railroad ties would be required for track construction. The estimated requirement for rail line ballast would be approximately 2.5 million metric tons (2.8 million tons), approximately 2.2 million metric tons (2.4 million tons) for subballast (DIRS 180874-Nevada Rail Partners 2007, Section 3.1.1, p. 3-1). Use of these materials would not be considered an irretrievable commitment of resources because they could be recovered and recycled if DOE eventually abandoned the rail line.

8.2.3.12 Hazardous Materials and Waste

DOE did not identify any associated irreversible and irretrievable commitments of resources along the Mina rail alignment, other than the irreversible loss of land used for landfills.

8.2.3.13 Cultural Resources

Cultural resources (archeological, historical, and ethnographic) are nonrenewable resources and any loss would be irreversible. At this time, DOE cannot fully characterize potential effects on cultural resources along the Mina rail alignment or the magnitude of these effects.

8.2.3.14 Paleontological Resources

At this time DOE has not identified any impacts to paleontological resources along the Mina rail alignment, but any impact that could occur would be irreversible.

8.2.3.15 Environmental Justice

DOE determined that constructing and operating the proposed railroad along the Mina rail alignment would not cause high or adverse impacts to fall disproportionately on minority or low-income populations. Thus, DOE did not identify any associated irreversible and irretrievable commitments of resources along the Mina rail alignment that would present an environmental justice concern.

PREPARERS, CONTRIBUTORS, AND REVIEWERS

This chapter identifies the individuals who had key responsibilities in the preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS, and summarizes their education and professional experience.

Preparers and Contributors

The U.S. Department of Energy (DOE or the Department) provided direction to the NEPA analysis team, which was responsible for developing the analytical methodology and alternatives, coordinating the work tasks, performing the impact analyses, and producing the documents. DOE is responsible for data quality, scope, content, issue resolution, and direction.

In addition, Bechtel SAIC Company, LLC, and its subcontractors prepared engineering-based documentation and information that was independently evaluated and incorporated into the Nevada Rail Corridor SEIS and the Rail Alignment EIS. DOE retained the responsibility for determining the appropriateness and adequacy of incorporating any data, analyses, and results of other work performed by these organizations into the SEIS and the EIS; the NEPA analysis team integrated this work in the documents.

The table below lists the names, education, experience summaries, and responsibilities of key personnel who managed, prepared, contributed to, and reviewed the Rail Corridor SEIS and the Rail Alignment EIS.

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 1 of 9).

Name	Education	Experience	Responsibilities
U.S. Department of Energy/Office of National Transportation			
M. Lee Bishop	B.S., Biology, 1987	16 years – NEPA; environmental permitting and protection; health physics; radioactive waste management	SEIS/EIS Document Manager
Robert Black	M.P.A., Public Administration, 1984 M.N.S., Biological Sciences, 1977 B.S., Zoology, 1969	32 years – NEPA compliance; environmental studies; resource management	Technical reviewer
Robert Clark	B.S., Marine Engineering, 1981	24 years – nuclear design; construction; quality assurance; radioactive waste management	Rail line conceptual design; mitigation; technical reviewer
Ned B. Larson	M.S., Geotechnical Engineering, 1982 B.S., Civil Engineering, 1978	25 years – engineering and design of numerous civil structures; soil and rock mechanics investigations; design of facilities to dispose of hazardous and nuclear wastes; project management	Nevada Rail Federal Project Director

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 2 of 9).

Name	Education	Experience	Responsibilities
U.S. Department of Energy/Office of National Transportation (continued)			
Narendra Mathur	M.S., Environmental Engineering, 1972	30 years – NEPA compliance and documentation; environmental, safety, and health compliance; environmental audits; environmental program management; environmental regulatory compliance	National transportation
Robin L. Sweeney	Ph.D., Environmental Science and Public Policy, 2006 M.S., Geosciences, 1987 B.S., Biological Sciences, 1980	22 years – hazardous and nuclear waste field, waste management, RCRA/ CERCLA facility assessments, sampling and monitoring, project and program management, laboratory research	Technical Advisor, Nevada Transportation Project Manager
Mark Vandeberg	B.S., Geology, 1984	22 years – geotechnical/ environmental projects; CERCLA site restoration; DOE FUSRAP program management; environmental compliance and permitting	Technical reviewer
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Management Team			
Michael West Potomac-Hudson Engineering, Inc.	M.S., Environmental Engineering, 2001 B.S., Environmental Engineering, 1993	14 years – NEPA analysis; environmental studies; regulatory analysis; program management	Project Manager Project Controls Officer Deputy Quality Assurance Manager
A. Brook Crossan, P.E. Potomac-Hudson Engineering, Inc.	Ph.D., Geophysical Fluid Dynamics, 1974 M.S., Mechanical Engineering, 1971 B.S., Mechanical Engineering, 1969	35 years – NEPA analysis and mitigation design; environmental permitting; project management	Project Manager Technical reviewer
Jeffrey McCann Potomac-Hudson Engineering, Inc.	B.G.S., Geology, 1980	26 years – geological analysis; NEPA specialist; program management	Deputy Project Manager Engineering interface and project integration
Elizabeth Kavanagh Potomac-Hudson Engineering, Inc.	B.S., Environmental Science, 2000	6 years – NEPA review and supporting studies; environmental management systems; regulatory compliance	Deputy Project Manager Project integration
Robert Peel URS Corporation	B.S., Geography, 1976	30 years – DOE and commercial nuclear projects; NEPA document management; environmental impact analysis; regulatory compliance	Deputy Project Manager

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 3 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Management Team (continued)			
Neil Sullivan ICF International	M.S., Integrated Environmental Management, 1999 B.S., Human and Physical Geography, 1994	11 years – NEPA documentation for rail and other nonlinear projects; environmental program management; technical and policy analysis	Deputy Project Manager Lead, Rail Alignment EIS Chapter 1
Judith Shipman Potomac-Hudson Engineering, Inc.	A.A., General Studies, 1991	31 years – NEPA documentation; document production coordination; editing; quality assurance	Document Manager Editorial lead
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team			
Jeff Ang-Olson ICF International	Master of City Planning, 1997 M.S., Transportation Engineering, 1997	11 years – passenger and freight transportation planning and analysis	Analyst, Shared-Use Option
Matthew Barkley ICF International	M.A., Organizational Management, 2006 Certificate of Environmental Management, 2002 B.S., Environmental Resource Management, 1997	8 years – NEPA and environmental consulting, including cumulative impact assessments, wetland delineations, and hazardous materials surveys	Analyst, mitigation, cumulative impacts
Stephanie Barrett ICF International	M.P.A., Environmental Policy, 1998 B.S., Geology, 1994	11 years – environmental policy analysis, including hazardous waste, land revitalization programs, and land use impact for NEPA projects; 2.5 years – RCRA and groundwater contamination sampling and reporting	Analyst, land-use impacts and Rail Alignment EIS Chapter 2
Anthony Becker Potomac-Hudson Engineering, Inc.	B.S., Biology, 2003	4 years – NEPA analysis	Lead analyst, waste and hazardous materials
Mark Bethoney ICF International		16 years – GIS and computer-aided mapping	GIS, CAD, map atlas creation/production, graphics
Fred Carey, P.E. Potomac-Hudson Engineering, Inc.	M.S., Environmental Engineering, 1997 B.S., Civil Engineering, 1992	15 years – NEPA management and impact analysis; civil engineering	Senior Technical Reviewer
Edward Carr ICF International	M.S., Atmospheric Science, 1983 B.S., Meteorology, 1979	19 years – air quality impact assessments; air quality modeling; emission inventory development; meteorological data collection and assessment	Lead analyst, air quality and climate

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 4 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team (continued)			
Austina Casey Potomac-Hudson Engineering, Inc.	M.S., Environmental Sciences, 2001 B.S., Chemistry, 1990	16 years – environmental compliance; air permits and air quality impact assessments preparation; emissions inventory development; RCRA investigations	Analyst, air quality and climate
Nancy Clark Potomac-Hudson Engineering, Inc.	J.D., 2004 M.S.E.L., Environmental Law, 2004 B.S., Chemical Engineering, 2001	7 years – NEPA analysis; nuclear waste engineering; environmental law	Analyst, statutory requirements Engineering interface
David Coate ICF International	M.S., Energy Technology, 1980 B.A., Mathematics, 1978 B.A., Physics, 1978 B.A., Chemistry, 1978	28 years – acoustics and vibrations analysis	Lead analyst, noise and vibration
Brian Colson URS Corporation	B.S., Geography, 2004	2 years – NEPA projects; various FEMA projects; energy projects, and transportation projects for public and private sectors	Cartographer GIS analyst for biological, cultural, and groundwater resources
Anna Compton URS Corporation	M.S., Geography, pending (coursework, examinations, and research completed) B.S., Logistics & Transportation, 2003	5 years – GIS analysis; cartography	Analyst, water resources
Charina Contreras		10 years – administrative and records support	Administrative record and references support
Theodore Coogan ICF International	B.S., Environmental Earth Science, 1986	23 years – marine geochemistry and geospatial sciences	GIS and mapping
Mary Jo Crance URS Corporation	M.S., pending B.S., Environmental Science, 1991 B.A., Environmental Studies, 1991 A.A.S., Laboratory Technology, 1985	18 years – radiological, chemical, and biological characterizations and mitigations through habitat investigations; surface-water sampling; groundwater sampling; NEPA analysis	Analyst, water resources
Maria de la Paz Aviles Potomac-Hudson Engineering, Inc.	M.S., Environmental Management and Planning, 2004 B.S., Biological Resources Engineering, 2002	5 years – NEPA support; field studies	GIS, CAD, graphics creation and production

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 5 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team (continued)			
James Dendy URS Corporation	B.S., Geology, 1999 (emphasis in hydrogeology)	8 years – senior environmental consultant/hydrogeologist for DoD and DOE	Analyst, groundwater resources
Steve Diem URS Corporation	M.S., Biology, 1999 B.S., Engineering Geology, 1994	9 years – geological consulting and paleontology	Technical reviewer, paleontological resources
Michelle Moser ICF International	M.S., Biological Sciences, 2005 B.S., Environmental Sciences, 2002	4 years- environmental and biological studies; NEPA analysis; regulatory analysis	Quality assurance support; SEIS editorial support
Frank Gallivan ICF International	Master of City Planning, 2006 B.A., Economics / Classical Archaeology, 2001	3 years – transportation studies, master planning, and land use studies	Analyst, Shared-Use Option
Lynne Gilman Potomac-Hudson Engineering, Inc.		35 years – document management; quality control	Project and quality controls; reference traceability
Elizabeth Gormsen ICF International	M.P.P., Public Policy, 2002 B.A., Economics, 1998	6 years – policy analysis; economic and regulatory analysis; socioeconomic impact analysis	Analyst, socioeconomics
Joe Grieshaber Potomac-Hudson Engineering, Inc.	M.B.A., Finance, 1984 M.S., Biology, 1974 B.S., Biology, 1972	30 years – NEPA analysis; project management; environmental compliance	Technical reviewer; project controls
Mark Hale URS Corporation	M.A., pending (coursework, examinations, and research completed) B.A., Anthropology,1983	25 years – federal experience, including DOE and BLM; NEPA document preparation for variety of federal projects, including rail construction; NEPA review and evaluations; Section 106 Compliance	Analyst, cultural resources
Brian Harper URS Corporation	M.S., Nuclear Engineering, 2006 B.S., Chemical Engineering, 1997	3 years – radiological monitoring/analysis; investigation of nuclear fuel cycle impacts; groundwater and contaminant transport modeling	Analyst, water resources

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 6 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team (continued)			
Seth Hartley ICF International	M.S., Atmospheric Sciences, 2000 B.S., Physics, 1996	7 years – air pollution and air quality, particularly as related to transportation, as well as general numerical modeling, engineering, and data handling and analysis issues	Analyst, air quality and climate
Jennifer Kelly URS Corporation	B.S., Earth Science, 2004 B.A., Anthropology, 1993	3 years – environmental investigation projects; environmental remediation; groundwater and soil investigations; sampling and analysis reports	Analyst, groundwater resources
Michael Kelly URS Corporation	M.A., Anthropology, 1986 B.A., Anthropology, 1978	26 years – cultural resources management; Great Basin archaeology	Lead Analyst, cultural resources and American Indian interests
Kavi Koleini URS Corporation	B.S., Environmental Science, 1999	7 years – natural resource inventory, analysis, and reporting; preparation of NEPA documents for long-term land-use plans	Biological surveys of potential quarry sites
Tanvi Lal ICF International	M.S.E.S., Environmental Conservation and Management, 2006 M.P.A., Environmental Economics and Policy, 2006 B.S., Life Sciences, 2001	1 year – NEPA analysis, environmental science, natural resource conservation, and environmental economics	Project controls; quality assurance
David Lawrence URS Corporation		12 years – visual simulation and analysis; experience with the BLM Visual Resource Management system and the U.S. Forest Service Visual Management System	Analyst, aesthetics
Robert Lanza ICF International	M. Eng., Chemical Engineering, 1982 B.S., Chemical Engineering, 1980	25 years – NEPA document preparation and review, including NEPA documentation for proposed radioactive and hazardous waste management units and radioactive and hazardous materials transportation projects	Lead analyst, occupational and public health and safety
Alistair Leslie ICF International	Ph.D., Chemistry, 1975 B.A., Physics and Chemistry, 1966	30 years – NEPA analysis, environmental regulation and compliance; electric-power generation and transmission; energy analysis; air pollution analysis; air quality legislation; atmospheric chemistry research	Lead analyst, utilities, energy, and materials; unavoidable impacts Lead, Summary and Rail Alignment EIS Chapter 6

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 7 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team (continued)			
Jon Luellen URS Corporation	B.S., Geology, 1979 B.S., Physics, 1977	19 years – hydrogeologic investigations; site characterization; monitoring system design and implementation; site remediation; water resource assessments; nuclear disposal facility design and licensing	Lead analyst, groundwater resources
Jamie Martin-McNaughton Potomac-Hudson Engineering, Inc.	B.S., Geology-Biology, 2003	4 years – NEPA analysis, geology and soils science	Lead analyst, physical setting, geology, soils
Kristine Mayer URS Corporation	B.S., Geography, 2004	2 years – NEPA projects; various FEMA projects; energy projects	Cartographer GIS analyst
David McIntyre Potomac-Hudson Engineering, Inc.	M.S., Environmental Management, 1997 M.A., Geography, 2000 B.S., History 1990	16 years – NEPA analysis; environmental studies; program management	Lead, Nevada Rail Corridor SEIS
Aaron McKinnon Potomac-Hudson Engineering, Inc.		10 years – document production, graphics	Lead desktop publisher; graphics coordinator
Evelyn Mayfield		30 years – writing, editing, document production	Editorial support
Michelle Moser ICF International	M.S., Biological Sciences, 2005 B.S., Environmental Science, 2002	5 years – NEPA analysis, rulemaking support, and ecological risk assessments	Analyst, mitigation and best management practices
Elena Nilsson URS Corporation	M.A., Anthropology, 1985 B.A., English, 1978	28 years – cultural resources management; NEPA document preparation for variety of federal projects, including rail construction; NEPA review and evaluations; Section 106 Compliance	Analyst, cultural resources
Becky Oldham Potomac-Hudson Engineering, Inc.	B.S., English, 1991	15 years – NEPA analysis; document management	Lead analyst, environmental justice
Cynthia Ong Potomac-Hudson Engineering, Inc.	M.S., Environmental Science, 2003 B.S., Civil Engineering, 1994	5 years – land development; stormwater design; NEPA analysis	Analyst, transportation; surface water; utilities, energy, and materials
Marek Ostrowski URS Corporation	M.S., Water Resources and Hydraulics, 1999 B.S., Civil Engineering, 1989	17 years – hydrogeology, hydrology and hydraulics; groundwater flow and contaminant transport modeling; design of drainage and remediation systems; water supply evaluations	Analyst, water resources

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 8 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS and Rail Alignment EIS Preparation Team (continued)			
Dautis Pearson URS Corporation	B.S., Biology, 1994	22 years – land management planning; interdisciplinary and interagency team leading and facilitation; NEPA document preparation	Analyst, biological resources
Stephanie Pesek URS Corporation	B.S., Animal Science, 1997	7 years – threatened and endangered species surveys; NEPA document preparation; Section 404 permitting	Analyst, biological resources
Polly Quick ICF International	Ph.D., Anthropology, 1976 M.A., Anthropology, 1970 B.A., Anthropology, 1968	31 years – NEPA analysis; public participation	Lead analyst, aesthetics and socioeconomics
Jean Reynolds URS Corporation	M.S., Meteorology, 1967 B.S., Meteorology, 1965	18 years – meteorological research; 6 years – air quality permitting, NEPA analysis; program management, regulatory compliance and waste management	Lead analyst, paleontological resources
Danny Rakestraw URS Corporation	M.S., Wildlife Ecology, 1995 B.S., Wildlife Ecology, 1986	16 years – endangered species compliance; environmental impact monitoring; biological resource studies	Analyst, biological resources and water resources
Mike Rivera Potomac-Hudson Engineering, Inc.	B.S., Environmental Planning and Analysis, 1993 B.S., Earth Science, 1992	13 years – NEPA analysis; wetland specialist	Analyst, water resources
Rachel Spangenberg Potomac-Hudson Engineering, Inc.	B.S., Biology, 1987	19 years – NEPA analysis; hazardous wastes; solid wastes	Analyst, physical setting
Mike Stanwood ICF International	M.S., Mineral Economics, 1979 B.A., Psychology, 1975	23 years – NEPA project management and process management; socioeconomics; land use; cultural resources; environmental justice; visual resources	Lead analyst, cumulative impacts and mitigation
Michelle Stegner URS Corporation	M.A., Anthropology, 2007 (pending) B.A., Geography-Anthropology, 1999	11 years – cultural resources management, Great Basin archaeology, NEPA document preparation; Section 106 compliance	Analyst, cultural resources
Adam Teepe ICF International	M.S., Environmental Science and Management, 2004 B.S., Environmental Geology, 2001	3 years – environmental impact analysis	Lead, Rail Alignment EIS Chapter 2 Engineering interface

DOE and contractor personnel education, experience, and responsibilities in preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS (page 9 of 9).

Name	Education	Experience	Responsibilities
Nevada Rail Corridor SEIS Rail Alignment EIS Preparation Team (continued)			
Nathan Wagoner ICF International	M.S., Human Dimensions of Ecosystem Science and Management, 2006 B.S., Natural Resources Integrated Policy and Planning, 2003	4 years – parks and recreation and visitor use characteristics	Analyst, aesthetics and land use
Toni Washington Potomac-Hudson Engineering, Inc.		17 years – federal records management	Administrative record and technical reference coordination; records management
Jen Wennerlund URS Corporation	B.S., Geography, Cartography, Remote Sensing, Land Use Planning, 1987	18 years – geosciences, GIS analyst, manager; NEPA analysis for federal, state, and private projects	GIS Manager
Marcy Westover URS Corporation	B.S., Biology, 2000	6 years – natural resources; ecology; threatened and endangered species surveys; NEPA document preparation	Analyst, biological resources
Brian Whipple, P.E. Potomac-Hudson Engineering, Inc.	M.S., Information Science, 2003 B.S., Environmental Engineering, 1993	14 years – NEPA analysis; environmental remediation; engineering studies; regulatory compliance	Lead analyst, surface-water resources
Hovalin Woods ICF International	M.P.A., Environmental Policy and Management, 2001 B.S., Finance, 1999	7 years – NEPA analysis for rail projects and other linear projects, environmental management systems	Analyst, cumulative impacts
Audra Ziolkowski Potomac-Hudson Engineering, Inc.	B.A, Journalism/Mass Communications English, 1995	12 years – Editing, writing, proofreading, fact checking	Editor
Zintars Zadins URS Corporation	Ph.D., Geology, 1989 M.S., Geology, 1983 B.S., Geology, 1979	19 years – geologic and environmental remediation investigations in the academic, federal, and private sectors	Peer reviewer, groundwater resources

a. BLM = Bureau of Land Management; CAD = computer-aided design; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DoD = U.S. Department of Defense; DOE = U.S. Department of Energy; FEMA = Federal Emergency Management Agency; FUSRAP = Formerly Utilized Sites Remedial Action Program; GIS = geographic information system; NEPA = National Environmental Policy Act; RCRA = Resource Conservation and Recovery Act.

Reviewers

The DOE Yucca Mountain Project Office incorporated input into the preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS from a number of other DOE offices that reviewed the document while it was under development. These offices included:

- The Office of Naval Reactors, Nuclear Energy
- The Office of Repository Development
- National Nuclear Security Administration, Nevada Operations Office

Cooperating and Consulting Agencies

Cooperating and consulting agencies in the preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS, who provided appropriate input or participated in document review and comment resolution processes, are as follows:

- Cooperating agencies
  - U.S. Bureau of Land Management
  - Surface Transportation Board
  - U.S. Air Force
- Consulting agencies
  - U.S. Bureau of Indian Affairs
  - Walker River Paiute Tribe
  - U.S. Army

Disclosure Statements

As required by federal regulations (40 Code of Federal Regulations 1506.5c), Potomac-Hudson Engineering, Inc., and its subcontractors have signed National Environmental Policy Act of 1969 (42 United States Code 4321) disclosure statements in relation to the work they performed on the Nevada Rail Corridor SEIS and the Rail Alignment EIS. These statements appear on the following pages.

Disclosure Statement

Environmental Impact Statement
Rail Alignment for the Nevada Transportation Project
DE-RP28-05RW12351

DEAR 952.209-8 ORGANIZATIONAL CONFLICTS OF INTEREST DISCLOSURE requires an offeror to provide a statement of any past (within the past twelve months), present, or currently planned financial, contractual, organizational, or other interests relating to the performance of the statement of work. The offeror is to provide a statement that no actual or potential conflict of interest or unfair competitive advantage exists with respect to the advisory and assistance services to be provided in connection with the instant contract or that any actual or potential conflict of interest or unfair competitive advantage that does or may exist with respect to the contract in question has been communicated as part of the statement.

"Financial interest or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)". See 46 FR 18026-18031.

In accordance with these requirements, the entity signing below hereby certify as follows: (check either (a) or (b) and list items being disclosed if (b) is checked).

Financial Interest:

(a) X Has no past, present, or currently planned financial interest in the outcome of the project.

(b) Has the following financial interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Contractual Interest:

(a) X Has no past, present, or currently planned contractual interest in the outcome of the project.

(b) Has the following contractual interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Organizational Interest:

(a) X Has no past, present, or currently planned organizational interest in the outcome of the project.

(b) Has the following organizational interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Other Interest:

(a) X Has no past, present, or currently planned other interest in the outcome of the project.

(b) Has the following other interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Unfair Competitive Advantage:

To the best of my knowledge and belief, no unfair competitive advantage exists with regard to Potomac-Hudson Engineering, Inc.'s participation on the instant contract.

Certified by:

Signature 08/12/05
Date

Fred Carey, Vice President
Name & Title (Printed)

Potomac-Hudson Engineering, Inc.
Company

Disclosure Statement

Environmental Impact Statement
Rail Alignment for the Nevada Transportation Project
DE-RP28-05RW12351

DEAR 952.209-8 ORGANIZATIONAL CONFLICTS OF INTEREST DISCLOSURE requires an offeror to provide a statement of any past (within the past twelve months), present, or currently planned financial, contractual, organizational, or other interests relating to the performance of the statement of work. The offeror is to provide a statement that no actual or potential conflict of interest or unfair competitive advantage exists with respect to the advisory and assistance services to be provided in connection with the instant contract or that any actual or potential conflict of interest or unfair competitive advantage that does or may exist with respect to the contract in question has been communicated as part of the statement.

"Financial interest or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)". See 46 FR 18026-18031.

In accordance with these requirements, the entity signing below hereby certifies as follows: (check either (a) or (b) and list items being disclosed if (b) is checked).

Financial Interest:

(a) X Has no past, present, or currently planned financial interest in the outcome of the project.

(b) Has the following financial interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Contractual Interest:

(a) X Has no past, present, or currently planned contractual interest in the outcome of the project.

(b) Has the following contractual interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

2.

3.

Organizational Interest:

(a) X Has no past, present, or currently planned organizational interest in the outcome of the project.

(b) Has the following organizational interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

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3.

Other Interest:

(a) X Has no past, present, or currently planned other interest in the outcome of the project.

(b) Has the following other interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

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3.

Unfair Competitive Advantage:

To the best of my knowledge and belief, no unfair competitive advantage exists with regard to ICF Incorporated's participation on the instant contract.

Certified by:

Michael Berg 8/10/05
Signature Date

Michael Berg, Senior Vice President
Name & Title (Printed)

ICF Incorporated, LLC
Company

Disclosure Statement

Environmental Impact Statement
Rail Alignment for the Nevada Transportation Project
DE-RP28-05RW12351

DEAR 952.209-8 ORGANIZATIONAL CONFLICTS OF INTEREST DISCLOSURE requires an offeror to provide a statement of any past (within the past twelve months), present, or currently planned financial, contractual, organizational, or other interests relating to the performance of the statement of work. The offeror is to provide a statement that no actual or potential conflict of interest or unfair competitive advantage exists with respect to the advisory and assistance services to be provided in connection with the instant contract or that any actual or potential conflict of interest or unfair competitive advantage that does or may exist with respect to the contract in question has been communicated as part of the statement.

"Financial interest or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)". See 46 FR 18026-18031.

In accordance with these requirements, the entity signing below hereby certify as follows: (check either (a) or (b) and list items being disclosed if (b) is checked)..

Financial Interest:

(a) X Has no past, present, or currently planned financial interest in the outcome of the project.

(b) Has the following financial interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

Contractual Interest:

(a) Has no past, present, or currently planned contractual interest in the outcome of the project.

(b) X Has the following contractual interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

California Institute of Technology
200 E. California Blvd., Pasadena CA 91125-0600
Nathan Niemy, PhD, (626) 395-6166
URS is completing development of Environmental Assessments of potential impacts of new geodetic monitoring stations to be installed by CalTech in southern Nevada and southeastern California. The stations will be used to monitor minute movements in the tectonic plates in the region so that the Department of Energy can evaluate potential performance of the Yucca Mountain repository. CalTech is installing the stations as a subcontract to the University of Nevada System on a grant from the DOE. URS' interest in the project will be completed in by the end of September, if not earlier.
URS POC: Danny Rakestraw
Client Contract Number: 26698733
Wilbur Smith Associates
201 Mission Street, Suite 1450, San Francisco CA, 94105
Justin Fox, Chief of Rail Studies. 415-495-6201 (Fax) 415-495-5305
As a subcontractor to Wilbur Smith Associates, URS evaluated potential economic benefits to the counties of Nye, Lincoln and Esmeralda from a new freight rail line to serve the federal geologic waste repository at Yucca Mountain, Nevada. This preliminary assessment involved quantifying the freight traffic that would be generated by the new rail line, or diverted from shipment via truck, and translating transportation cost savings into local economic benefit. Shippers and potential shippers throughout the rail corridor were interviewed regarding their interest in rail shipment, and the savings it would represent. In addition, URS assessed the potential benefits the three counties might gain via involvement in the planning, construction, ownership and operation of the railroad.

URS POC: D. Sanford Stadtfeld
Client Contract Number: None Assigned
Bechtel SAIC
1180 Town Center Drive, Las Vegas, NV 889144
Richard Pemisi, (702) 821-7720
Development of preclosure seismic design and posclosure performance assessment ground motions for the repository and surface facilities. Activities include geotechnical and geological site characterization and numerical modeling of earthquake ground motions.
URS POC Ivan Wong
Subcontract #QA-HC4-00443

Organizational Interest:

(a) X Has no past, present, or currently planned organizational interest in the outcome of the project.

(b) Has the following organizational interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

Other Interest:

(a) X Has no past, present, or currently planned other interest in the outcome of the project.

Unfair Competitive Advantage:

To the best of my knowledge and belief, no unfair competitive advantage exists with regard to URS Group Inc.'s participation on the instant contract.

Certified by:

Signature August 11, 2005
Date

Edward Jennrich, Vice President
Name & Title (Printed)

URS Group, Inc
Company

Disclosure Statement
Environmental Impact Statement
Rail Alignment for the Nevada Transportation Project
DE-RP28-05RW12351

DEAR 952.209-8 ORGANIZATIONAL CONFLICTS OF INTEREST DISCLOSURE requires an offeror to provide a statement of any past (within the past twelve months), present, or currently planned financial, contractual, organizational, or other interests relating to the performance of the statement of work. The offeror is to provide a statement that no actual or potential conflict of interest or unfair competitive advantage exists with respect to the advisory and assistance services to be provided in connection with the instant contract or that any actual or potential conflict of interest or unfair competitive advantage that does or may exist with respect to the contract in question has been communicated as part of the statement.

"Financial interest or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)". See 46 FR 18026-18031.

In accordance with these requirements, the entity signing below hereby certify as follows: (check either (a) or (b) and list items being disclosed if (b) is checked).

Financial Interest:

(a) X Has no past, present, or currently planned financial interest in the outcome of the project.

(b) Has the following financial interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

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Contractual Interest:

(a) X Has no past, present, or currently planned contractual interest in the outcome of the project.

(b) Has the following contractual interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

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Organizational Interest:

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Other Interest:

(a) X Has no past, present, or currently planned other interest in the outcome of the project.

(b) Has the following other interest in the outcome of the project and hereby agree to mitigate to the extent necessary to preclude a conflict prior to award of this contract:

1.

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3.

Unfair Competitive Advantage:

To the best of my knowledge and belief, no unfair competitive advantage exists with regard to Image Associates, LLC participation on the instant contract.

Certified by:

Signature — 8/11/05 Date

Diane L. Gunter, President

Name & Title (Printed)

Image Associates, LLC

Company

GLOSSARY

DOE prepared this glossary to help readers understand information in the Supplemental Yucca Mountain Nevada Rail Corridor EIS and Rail Alignment EIS. This glossary includes definitions of technical and regulatory terms common to DOE NEPA documents and explains these terms with their most likely meanings in the context of DOE NEPA documents, and in particular this document. To better aid the reader, a number of terms in this glossary emphasize their specific relationship to the proposed railroad project and to the Yucca Mountain Repository. DOE obtained each definition from an authoritative source (for example, a statute, regulation, DOE directive, dictionary, or technical reference book).

Words in ***bold italics*** refer to other words in the glossary.

100-year flood	A flood event of such magnitude that it occurs, on average, every 100 years; this equates to a 1-percent chance of its occurring in a given year. A base flood may also be referred to as a 100-year storm. The area inundated during the base flood is sometimes called the 100-year ***floodplain***.
136 RE rail	This term denotes rail with a nominal weight of 136 pounds per yard specified in English units, and is also specified as 132 metric tons per kilometer (234 tons per mile) for two-rail track.
500-year flood	A flood event of such magnitude that it occurs, on average, every 500 years; this equates to a 0.2-percent chance of its occurring in a given year.
50-year flood	A flood event of such magnitude that it occurs, on average, every 50 years; this equates to a 2-percent chance of its occurring in a given year.
accessible environment	For this ***environmental impact statement*** (EIS), all points on Earth outside the surface and subsurface area controlled over the long term for the ***repository***, including the atmosphere above the controlled area.
accident	An unplanned sequence of events that results in undesirable consequences. Examples in this Rail Alignment EIS include an inadvertent release of ***radiation*** from the ***casks*** or hazardous materials from their containers; train derailments; vehicular accidents; and construction-related accidents that could affect workers.
acre-foot	A unit commonly used to measure water volume. It is the quantity of water required to cover 4,047 square meters (1 acre) to a depth of 0.3048 meter (1 foot), and is equal to 1,233.5 cubic meters (325,851 gallons).

AERMOD (AMS/EPA Regulatory Model) — A short-range steady-state ***air quality*** dispersion model. The model incorporates air dispersion concepts based on the state-of-the-science understanding of planetary boundary layer turbulence structure and scaling concepts. On December 9, 2005, AERMOD became the U.S. Environmental Protection Agency (EPA) preferred air dispersion model in place of ISC3.

AERMET (AERMOD Meteorological Preprocessor) — The meteorological preprocessor component of ***AERMOD***. Surface meteorological observations, hourly cloud-cover observations, and twice-a-day upper air sounds are "preprocessed" by AERMET into data used by AERMOD.

AERMAP (AERMOD Maps terrain Preprocessor) — The terrain preprocessor that uses data from the Digital Elevation Model Database and creates a file suitable for use within ***AERMOD***. This file contains elevation and hill-height scaling factors for each receptor for use by AERMOD.

aerosol — A suspension of tine, ***colloid***-size particles or liquid droplets in air. Fog and smoke are common examples of aerosols.

affected environment — For an EIS, a description of the existing ***environment*** (site description) covering information that relates directly to the scope of the ***Proposed Action***, the ***No-Action Alternative***, and the ***implementing alternatives*** being analyzed; that is, the information necessary to assess or understand the ***impacts***. This description must contain enough detail to support the impact analysis. The information must highlight "environmentally sensitive resources," if present; these include ***floodplains*** and ***wetlands***, ***threatened*** and ***endangered species***, prime and unique agricultural lands, and property of historic, archaeological, or architectural significance.

Agreement State — A state that reaches an agreement with the U.S. Nuclear Regulatory Commission (NRC) to assume regulatory authority to license and regulate ***radioactive*** materials.

air quality — A measure of the concentrations of pollutants, measured individually, in the air.

alien species — With respect to a particular ***ecosystem***, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

alkalinity — Acid-neutralizing capacity of a substance. High alkalinity conditions can promote metal ***corrosion***.

alluvial fan — A low, outspread, relatively flat-to-gently sloping mass of loose rock material, shaped like an open fan or a segment of a cone, deposited by a stream where it issues from a narrow mountain valley on a plain or break valley.

alluvium — A general term for the sedimentary material deposited by flowing water.

alpha particle

A positively charged particle ejected spontaneously from the nuclei of some ***radioactive*** elements. It is identical to a helium ***nucleus*** and has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). See ***ionizing radiation.***

alternative

One of two or more actions, processes, or propositions, from which a decisionmaker will determine the course to be followed. The National Environmental Policy Act, as amended, states that in preparing an EIS, an agency "shall ... (s)tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources" [42 U.S.C. 4321, Title I, Section 102(E)]. The regulations of the Council on Environmental Quality that implement the National Environmental Policy Act indicate that the alternatives section is "the heart of the ***environmental impact statement*** (40 CFR 1502.14), and include rules for presentation of the ***alternatives***, including no action, and their estimated impacts.

The Nevada Rail Corridor SEIS analyzes one alternative to the ***Proposed Action***, the ***No-Action Alternative***. Under the Nevada Rail Corridor SEIS No-Action Alternative, the U.S. Department of Energy (DOE or the Department) would not select a ***rail alignment*** within the Mina ***rail corridor*** for the construction and operation of a ***railroad***. As such, the No-Action Alternative provides a basis for comparison to the Proposed Action.

The Rail Alignment EIS analyzes one alternative to the Proposed Action – the No-Action Alternative – and two implementing alternatives under the Proposed Action – the Caliente Implementing Alternative and the Mina Implementing Alternative – for constructing, operating, and possibly abandoning a ***railroad*** for the shipment of ***spent nuclear fuel*** and ***high-level radioactive waste*** for long-term ***disposal*** in a ***geologic repository*** at Yucca Mountain. Under the No-Action Alternative, DOE would not construct the proposed railroad along the Caliente rail alignment or the Mina rail alignment.

alternative segments

Geographic region of the ***rail alignment*** for which multiple routes for the ***rail line*** have been identified. In this Rail Alignment EIS, there are different alignments identified within the Caliente ***rail corridor*** and the Mina ***rail corridor*** that could minimize or avoid environmental ***impacts*** and reduce construction complexities.

ambient

(1) Undisturbed, natural conditions such as ambient temperature caused by climate or natural subsurface thermal gradients. (2) Surrounding conditions.

ambient air

The surrounding atmosphere, usually the outside air, as it exists around people, plants, and structures. It is not the air in the immediate proximity to emission sources.

ambient air quality standards	Standards established on a federal or state level that define the limits for airborne concentrations of designated ***criteria pollutants*** [***nitrogen dioxide***, ***sulfur dioxide***, ***carbon monoxide***, ***particulate matter*** with aerodynamic diameters less than 10 microns (***PM_{10}***), particulate matter with aerodynamic diameters less than 2.5 microns (***$PM_{2.5}$***), ***ozone***, and lead] to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).
ambient noise	The sum of all sounds (noise is unwanted sound) at a specific location over a specific time.
animal unit month	(1) A standardized unit of measurement of the amount of forage necessary for the complete sustenance of one animal for 1 month. (2) A unit of measurement of grazing privileges that represents the privilege of grazing one animal for 1 month.
aquifer	A subsurface saturated rock unit (formation, group of formations, or part of a formation) of sufficient ***permeability*** to transmit ***groundwater*** and yield usable quantities of water to wells and springs.
aquitard	A rock unit or layer that stores water and allows it to move only at a very slow rate.
Areas of Critical Environmental Concern	Places within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, and other natural systems, or processes or to protect life and safety from natural hazards.
arid	(1) Areas in which mean annual evaporation exceeds mean annual precipitation; (2) having insufficient rainfall to support agriculture; (3) the hyper-arid zone (arid index 0.03) comprising dry land areas without vegetation with the exception of a few scattered shrubs. Annual rainfall is low, rarely exceeding 100 millimeters (4 inches). In the arid zone (arid index 0.03-0.20), the native vegetation is sparse, being comprised of annual and perennial grasses and other herbaceous vegetation, and shrubs and small trees. There is high rainfall variability, with annual amounts ranging between 100 and 300 millimeters (4 and 12 inches).
at-grade crossing	Occurs when a roadway and a ***rail line*** cross paths at the same elevation.
atomic mass	The mass of a neutral atom, based on a relative scale, usually expressed in atomic mass units. See ***atomic weight.***
atomic nucleus	See ***nucleus***.
atomic number	The number of ***protons*** in an atom's ***nucleus***.

atomic weight	The relative mass of an atom based on a scale in which a specific carbon atom (carbon-12) is assigned a mass value of 12. Also known as relative ***atomic mass***.
A-weighted decibel scale	See ***decibel, A-weighted***.
Back Country Byway	A vehicle route that traverses scenic corridors utilizing secondary or back country road systems
background radiation	***Radiation*** from cosmic sources, naturally occurring ***radioactive*** materials such as granite, and global fallout from nuclear testing.
ballast	The coarse rock that is placed under the ***railroad*** tracks to support the railroad ties and improve drainage along the ***rail line***.
barrier	Any material, structure, or condition (as a thermal barrier) that prevents or substantially delays the movement of water or ***radionuclides***.
basalt	A dark gray to black, dense to fine-grained, ***igneous*** rock.
baseline	The existing environmental conditions against which impacts of a ***proposed action*** and its alternatives can be compared.
berm	A mound or wall of earth.
beta particle	A negatively charged ***electron*** or positively charged positron emitted from a ***nucleus*** during ***decay***. Beta decay usually refers to a ***radioactive*** transformation of a ***nuclide*** by electron emission, in which the ***atomic number*** increases by 1 and the mass number remains unchanged. In positron emission, the atomic number decreases by 1 and the mass number remains unchanged. See ***ionizing radiation.***
bio-based products	Energy, industrial, and consumer products made from renewable biological resources such as wood, agricultural residues, and fiber crops.
BLM-designated sensitive species	Species not already conferred U.S. Bureau of Land Management (BLM) special status by virtue of being (1) a federally listed, proposed, or ***candidate species***, or (2) a State of Nevada listed species. BLM policy is to provide these species with the same level of protection that is provided for candidate species in BLM Manual 6840.06 C.
block-bounding fault	A high-angle, ***normal fault*** with relatively large displacement that bounds one or both sides of the fault-block mountains typical of the Basin and Range province.
blowing soil	A soil characteristic based on the soil survey classification of susceptibility of a given soil to wind erosion. The blowing soils characteristic identifies areas where fine-textured, sandy materials predominate and where uncontrolled soil disturbance could result in increased wind erosion.

boiling-water reactor (BWR)	A ***nuclear reactor*** that uses boiling water to produce steam to drive a turbine.
borehole	For this Rail Alignment EIS, a hole drilled for purposes of collecting geotechnical information.
borosilicate glass	***High-level radioactive waste matrix*** material in which boron takes the place of the lime used in ordinary glass mixtures. See ***vitrification***.
borrow sites	Areas outside the ***nominal*** width of the ***rail-line construction right-of-way*** where construction personnel could obtain materials to be used in the establishment of a stable platform (subgrade) for the rail track. Aggregate crushing operations could occur in these areas.
buffer car	A flatbed railcar that would be placed at the front of a ***cask*** train between the locomotive and the first ***cask car*** and at the back of the train between the last cask car and the ***escort car***. Federal regulations require the separation of a railcar carrying ***spent nuclear fuel*** and ***high-level radioactive waste*** from a locomotive, occupied caboose, carload of undeveloped film, or railcar carrying another class of hazardous material by at least one ***buffer car***. These could be DOE railcars or, in the case of general freight service, commercial railcars.
caldera	An enlarged volcanic crater formed by explosion or collapse of the original crater.
cancer	A malignant tumor of potentially unlimited growth, capable of invading surrounding tissue or spreading to other parts of the body.
candidate species	Species for which the U.S. Fish and Wildlife Service has enough substantive information on biological status and threats to support proposals to list them as threatened or endangered under the Endangered Species Act. Listing is anticipated but has been precluded temporarily by other listing activities. See ***threatened species***, ***endangered species***.
canister	An unshielded metal container used as: (1) a pour mold in which molten vitrified ***high-level radioactive waste*** can solidify and cool; (2) the container in which DOE and electric utilities place intact ***spent nuclear fuel***, loose rods, or nonfuel components for shipping or ***storage***; or (3) in general, a container used to provide ***radionuclide confinement***. ***Canisters*** are used in combination with specialized overpacks that provide structural support, ***shielding*** or confinement for storage, transportation, and ***emplacement***. Overpacks used for transportation are usually referred to as transportation ***casks***; those used for emplacement in a ***repository*** are referred to as ***waste packages***.
carbon monoxide (CO)	A colorless, odorless, poisonous gas produced by incomplete fossil-fuel combustion; one of the six pollutants for which there is a national ***ambient air quality standard***.
carcinogen	An agent capable of producing or inducing ***cancer***.

carcinogenic	Capable of producing or inducing ***cancer***.
case file, BLM	A file typically including the following information: a report identifying the present users of the lands and how they would be affected; a report specifying water use for the project and how water would be obtained; an Environmental Assessment or ***EIS***; and floodplain and wetland impact statements. 43 CFR 2310.3-2 describes the required contents of a case file.
cask	A heavily shielded container that meets applicable regulatory requirements used to ship ***spent nuclear fuel*** or ***high-level radioactive waste***.
cask car	A railcar that would be used to transport ***casks*** of ***spent nuclear fuel*** or ***high-level radioactive waste***.
Cask Maintenance Facility	Processing location for empty transportation casks used to transport canistered fuel, including testing, inspection, maintenance, and decontamination
casual use	Activities ordinarily resulting in no or negligible disturbance of the public lands, resources, or improvements, including surveying, marking routes, and collecting data to use to prepare grant applications.
Census County Division	A statistical subdivision of a county, established and delineated cooperatively by the U.S. Census Bureau and state, local, and tribal officials for data presentation purposes. Census County Divisions have been established in states that do not have minor civil divisions suitable for data presentation. In these cases, minor civil divisions have not been legally established, do not have governmental or administrative purposes, have boundaries that are ambiguous or change frequently, or generally are not well known to the public.
Class 1 Area (related to air quality)	A specifically designated area in which the degradation of ***air quality*** is stringently restricted (for example, many national parks, wilderness areas).
Class 1 commercial railroad	The Surface Transportation Board defines a Class 1 commercial railroad as one with an annual operating revenue exceeding $277.7 million.
Class 3 road	A light-duty, paved or improved road.
Class 4 road	An unimproved, unsurfaced road (includes track roads in back country).
Class I inventory (related to cultural resources)	A study of published and unpublished documents, records, files, registers, and other sources, resulting in analysis and synthesis of all reasonably available data.

Class II inventory (related to cultural resources)	A sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area to make possible an objective estimate of the nature and distribution of cultural resources in the entire defined area.
Class III inventory (cultural resources)	An intensive field survey designed to locate and record all cultural resource sites within a specified area. Upon completion of such an inventory, no further cultural resource inventory work is normally needed in the area.
clastic	Describing a rock or sediment composed mainly of broken fragments of preexisting minerals or rocks that have been transported from their places of origin.
cloudshine	***Irradiation*** of the human body by ***neutrons*** and ***gamma rays*** emitted by the passing plume of ***radioactive*** material.
collective dose	See ***population dose***.
colloid	Small particles in the size range of 10^{-9} to 10^{-6} meters that are suspended in a solvent. Naturally occurring colloids in ***groundwater*** arise from clay minerals.
colluvium	Loose earth material that has accumulated at the base of a hill through the action of gravity.
commercial spent nuclear fuel	Commercial nuclear fuel rods that have been removed from ***reactor*** use at civilian nuclear power plants that generate electricity. See ***spent nuclear fuel*** and ***DOE spent nuclear fuel***.
committed groundwater resource	Within a given hydrographic area, the total volume of permitted, certificated, and vested groundwater rights that are recognized by the State Engineer and have been approved for withdrawal in a ***hydrographic area*** in any given year.
common segment	Geographic region of the ***rail alignments*** for which a single route for the ***rail line*** has been identified.
community water system	A public water system that serves year-round residents of a community, subdivision, or mobile home park that has more than 15 service connections or an average of more than 25 residents for more than 60 days of the year.
Condition 1, 2, 3	BLM ranking of areas for their potential to contain paleontological resources: ***Condition 1*** - Areas that are known to contain vertebrate ***fossils*** or noteworthy occurrences of invertebrate or plant fossils. ***Condition 2*** - Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. ***Condition 3*** - Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.

cone of depression	The lowering of the ***water table*** in a cone-shaped depression around a pumped well.
confinement	As it pertains to ***radioactivity***, the retention of ***radioactive*** material within some specified bounds. Confinement differs from containment in that there is no absolute physical ***barrier*** in the former.
construction and operations support facilities	Construction support facilities are the temporary facilities that would be used during the ***railroad*** construction phase (***construction camps***, quarries, some access roads, and some water wells). Operations support facilities are the permanent structures that would be used during the railroad operations phase (***Staging Yard***, ***Interchange Yard***, ***Maintenance-of-Way Facilities***, ***Rail Equipment Maintenance Yard***, ***Cask Maintenance Facility***, some access roads, and some water wells).
construction camps	Areas along the ***rail alignment*** that could be used as temporary residences for construction crews, material and equipment storage areas, and concrete production areas. Such camps would be used during rail-line construction activities far from population centers.
construction right-of-way	Property obtained for construction of the proposed railroad. This right-of-way would have a ***nominal*** width of 150 meters (500 feet) on either side of the centerline of the ***rail line***, but would vary at specific locations to accommodate, for example, certain deep ***cuts*** and ***fills***, and construction of drainage controls. In addition, some facilities (such as quarries) would be outside the nominal width of the ***construction right-of-way***, but DOE would also obtain rights-of-way in these areas. See ***operations right-of-way***.
contaminant	A substance that contaminates (pollutes) air, soil, or water. It could also be a hazardous substance that does not occur naturally or that occurs at levels greater than those occurring naturally in the surrounding ***environment***.
contamination	The intrusion of undesirable elements (unwanted physical, chemical, biological, or radiological substances, or matter that has an adverse effect) to air, water, or land.
convection	(1) Thermally driven ***groundwater*** flow or a heat-transfer mechanism for a gas phase. The bulk motion of a flowing fluid (gas or liquid) in the presence of a gravitational field, caused by temperature differences that, in turn, cause different areas of the fluid to have different densities (for example, warmer is less dense). (2) One of the processes that moves solutes in groundwater.
corrosion	The process of dissolving or wearing away gradually, especially by chemical action.
cosmic radiation	A variety of high-energy particles including ***protons*** that bombard the Earth from outer space. They are more intense at higher altitudes than at sea level, where the Earth's atmosphere is most dense and provides the greatest protection.

cosmogenic radionuclides	***Radioactive*** nuclides generated when the upper atmosphere interacts with many of the ***cosmic radiations***. Common cosmogenic ***radionuclides*** include carbon-14, tritium, and beryllium-7.
criteria air pollutants	Six common pollutants (***ozone***, ***carbon monoxide***, ***particulate matters***, ***sulfur dioxide***, lead, and ***nitrogen dioxide***) known to be hazardous to human health and the ***environment***, and for which the U.S. Environmental Protection Agency sets National ***Ambient Air Quality Standards*** under the Clean Air Act. See ***toxic air pollutants***.
crustal extension	Descriptive of the slow movement off ***tectonic plates*** stretching Earth's outer layer of rocks.
culvert	A conduit for conveying surface water through an embankment.
cumulative impact	The ***impact*** on the ***environment*** that results from the incremental impact(s) of an action when added to other past, present, or reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
cut	Cutting away from the top of a slope to fill in at the bottom, thereby providing a suitable grade for the rail ***roadbed***. See ***fill***.
day-night average noise level	The energy average of ***A-weighted decibel*** sound levels over 24 hours, which includes an adjustment factor for noise between 10 p.m. and 7 a.m. to account for the greater sensitivity of most people to noise during the night. The effect of nighttime adjustment is that one nighttime event, such as a train passing by between 10 p.m. and 7 a.m., is equivalent to 10 similar events during the daytime.
decay (radioactive)	The process in which one ***radionuclide*** spontaneously transforms into one or more different radionuclides called ***decay products***.
decay product	A ***nuclide*** resulting from the radioactive decay of a parent isotope or precursor nuclide.
decay series	The ***radioactive decay*** of different discrete radioactive decay products as a chained series of transformations. Most ***radioactive*** elements do not decay directly to a stable state, but rather undergo a series of ***decays*** until eventually a stable isotope is reached.
decibel (dB)	A standard unit for measuring sound pressure levels based on a reference sound pressure of 0.0002 dyne per square centimeter. This is the smallest sound a human can hear.

decibel, A-weighted (dBA)	A frequency-weighted ***noise*** unit that corresponds approximately to the frequency response of the human ear and thus correlates well with loudness. It is widely used for traffic and industrial noise measurements.
dedicated train	A train that handles only one commodity. For the proposed ***railroad***, this separate train with its own crew would limit switching between trains of the railcars carrying ***spent nuclear fuel*** and ***high-level radioactive waste***.
demand (related to groundwater)	The amount (volume) of water needed to complete a specified action.
desert	***Arid***, barren land incapable of supporting any considerable population without an artificial water supply.
designated groundwater basin	A ***hydrographic area*** identified by the State of Nevada when permitted water rights approach or exceed the estimated ***perennial yield*** and the water resources are being depleted or require additional administration.
dip-slip fault	A ***fault*** in which the relative displacement is along the direction of dip of the fault plane. If the block above the fault has moved downward, it is a ***normal fault***; upward movement indicates a ***reverse fault***.
direct impact	Effect that results solely from the construction or operation of a ***proposed action*** without intermediate steps or processes. Examples include ***habitat*** destruction, soil disturbance, air emissions, and water use.
disposal (of spent nuclear fuel and high-level radioactive waste)	The ***emplacement*** in a ***repository*** of ***spent nuclear fuel***, ***high-level radioactive waste***, or other highly ***radioactive*** material with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste, and the ***isolation*** of such waste from the ***accessible environment***.
disproportionately high and adverse environmental impacts	An environmental ***impact*** that is unacceptable or above generally accepted norms; these would include economic impacts of the ***Proposed Action***. A disproportionately high impact is one (or the ***risk*** of one) to a ***low-income population*** or ***minority population*** that significantly exceeds the impact to the general population. In assessing cultural and aesthetic impacts, agencies consider impacts that would have unique effects on geographically dislocated or dispersed low-income or minority populations.
distance zones	Landscape divisions based on their relative location to common viewpoints: foreground to middleground, background, and seldom seen. The foreground-middleground zone includes areas less than 5 to 8 kilometers (3 to 5 miles) away. The background zone includes areas visible beyond the foreground-middleground zone but usually less than 24 kilometers (15 miles) away. Areas not seen as foreground-middleground or background are in the seldom-seen zone.

DOE spent nuclear fuel	***Radioactive*** waste created by defense activities that consists of more than 250 different ***waste forms***. The major contributor to this waste form is the N-Reactor fuel currently stored at the Hanford Site. This waste form also includes 65 ***metric tons of heavy metal*** of ***naval spent nuclear fuel.***
dose (radioactive)	The amount of ***radioactive*** energy taken into (absorbed by) living tissues. See ***effective dose equivalent.***
dose equivalent	(1) The number (corrected for background) zero and above that is recorded as representing an individual's ***dose*** from external ***radiation*** sources or internally deposited ***radioactive*** materials; (2) the product of the absorbed dose in ***rads*** and a quality factor; (3) the product of the absorbed dose, the quality factor, and any other modifying factor. The ***dose equivalent*** quantity is used for comparing the biological effectiveness of different kinds of radiation (based on the quality of radiation and its spatial distribution in the body) on a common scale; it is expressed in ***rem***.
dose rate	The ***dose*** per unit time.
dose risk	The product of a ***radiation dose*** and the ***probability*** of its occurrence.
duty (related to groundwater)	The amount of water either appropriated or under consideration for appropriation by the Nevada State Engineer to a water rights holder in the State of Nevada. Duty is typically specified in terms of a total annual duty or total duty granted over a specified seasonal period to a water rights holder. A ***pending annual duty*** value represents an annual duty for which an appropriation application has been submitted to the State Engineer for consideration and that the State Engineer has classified as a pending annual duty value within a specified ***groundwater*** basin (***hydrographic area***), in accordance with Nevada Revised Statutes contained in Chapter 533 and pursuant to the application review process contained in Nevada Revised Statutes 533.370.
earthquake	A series of elastic waves in the crust of the Earth caused by abrupt movement easing strains built up along ***geologic faults*** or by volcanic action and resulting in movement of the Earth's surface.
ecoregion	A relatively discrete set of ***ecosystems*** characterized by certain plant communities or assemblages.
ecosystem	A community of organisms and their physical environment interacting as an ecological unit.
effective dose equivalent	Often referred to simply as ***dose***, it is an expression of the ***radiation*** dose received by an individual from external radiation and from ***radionuclides*** internally deposited in the body.
EIS	See ***environmental impact statement***.
electron	A stable elementary particle that is the negatively charged constituent of ordinary matter.

emplacement	The placement and positioning of ***waste packages*** in the ***repository***.
endangered species	A species that is in danger of extinction throughout all or a significant part of its range; a formal listing of the U.S. Fish and Wildlife Service under the Endangered Species Act.
endemic	Being native to one location only.
environment	(1) Includes water, air, and land and all plants and humans and other animals living therein, and the interrelationship existing among these. (2) The sum of all external conditions affecting the life, development, and survival of an organism.
environmental impact statement (EIS)	A detailed written statement that describes: "...the environmental impact of the ***proposed action***; any adverse environmental effects which cannot be avoided should the proposal be implemented; ***alternatives*** to the proposed action; the relationship between local short-term uses of man's ***environment*** and the maintenance and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Preparation of an EIS requires a public process that includes public meetings, reviews, and comments, as well as agency responses to the public comments.
environmental justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Executive Order 12898, *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing ***disproportionately high and adverse effects*** of agency programs, policies, and activities on ***minority populations*** and ***low-income populations***.
environmental resource areas	Areas examined for potential environmental impacts as part of the National Environmental Policy Act analysis process. Examples include ***air quality***, ***hydrology***, and biological resources.
ephemeral (creek, stream, wash, river, drainage)	A channel with a bed above the normal water table and only flows in direct response to precipitation or snowmelt within its drainage basin.

equivalent sound levels (L_{eq})	A single value of sound level for any desired duration (such as 1 hour), which includes all of the time-varying sound energy in the measurement period. L_{eq} correlates reasonably well with the effects of noise on people, even for wide variations in environmental sound levels and time patterns. It is used when only the durations and levels of sound, and not their times of occurrence (day or night), are relevant.
erionite	A natural fibrous zeolite in the rocks in and around Yucca Mountain that is listed as a known human ***carcinogen*** by recognized international agencies such as the International Agency for Research on Cancer.
erodes easily (soil characteristic)	A measure of the susceptibility of bare soil to be detached and moved by water. These soils, which tend to contain relatively high amounts of silts and ***loams***, have fair to poor erosion characteristics when disturbed.
escort cars	Railcars in which escort personnel would travel on trains carrying ***spent nuclear fuel*** or ***high-level radioactive waste***.
ethnographic	Describing the study and systematic recording of human cultures.
ethnographic landscape (ethnographic cultural landscape)	(1) A landscape containing a variety of natural or cultural resources that contemporary cultural groups define as meaningful because they are inextricably and traditionally linked to their own local or regional histories, cultural identities, beliefs, and behaviors. (2) A landscape that helps inform what it means to be a member of a particular culture, especially a culture (such as the American Indian culture) that is tied religiously to that landscape.
evapotranspiration	The combined processes of evaporation and plant ***transpiration*** that remove water from the soil and return it to the air.
exposure (to radiation)	The condition of being subject to the effects of or potentially acquiring a ***dose*** of ***radiation***. The incidence of radiation on living or inanimate material by ***accident*** or intent. Background exposure is the exposure to natural ionizing radiation. Occupational exposure is the exposure to ***ionizing radiation*** that occurs during a person's working hours. Population exposure is the exposure to a number of persons who inhabit an area.
exposure pathway	The course a chemical or physical agent takes from the source to the exposed organism; describes a unique mechanism by which an individual or population can become exposed to chemical or physical agents at or originating from a release site. Each exposure pathway includes a source or a release from a source, an exposure point, and an exposure route.
fan piedmont	The area along the base of a mountain slope within a large ***alluvial fan***.
fan remnants	Parts of an older ***alluvial fan*** that remain after erosion has removed most of the fan.
fan skirt	The area along the base of the ***alluvial fan*** in a valley.

fault	A ***fracture*** or a fracture zone in crustal rocks along which there has been movement of the fracture's two sides relative to one another, separating one continuous rock stratum or vein into parts.
faulting	The movement of the Earth's crust that produces relative displacement of adjacent rock masses along a ***fracture***.
fill	The material used to fill the bottom of a slope with material cut away from the top of a slope, thereby providing a suitable grade for the rail ***roadbed***. (See ***cut***.)
Fiscal Year	A 12-month period to which a jurisdiction's annual budget applies and at the end of which its financial position and the results of its operations are determined. For example, the Fiscal Year for Clark and Nye Counties, the Cities of Las Vegas and North Las Vegas, the Towns of Tonopah and Pahrump, and the Clark County and Nye County School Districts is from July 1 through the following June 30; the federal fiscal year runs from October 1 through the following September 30.
fission	The splitting of a ***nucleus*** into at least two other nuclei, resulting in the release of two or three ***neutrons*** and a relatively large amount of energy.
fission products	***Radioactive*** or nonradioactive atoms produced by the ***fission*** of heavy atoms, such as uranium.
floodplain	The lowlands adjoining inland and coastal waters, and relatively flat areas and flood-prone areas of offshore islands, including, at a minimum, that area inundated by a 1-percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0-percent) floodplain. The critical action floodplain is defined as the 500-year (0.2-percent) floodplain. (See ***100-year flood***, ***50-year flood***, ***500-year flood***.)
fluvial	Of or pertaining to rivers or produced by the action of a stream or river.
footprint	The area that would be covered by the ***rail line*** or ***rail-line construction and operations support facilities***. For certain of these facilities (for example, quarry sites), this would be the area inside the site fence line.
fossil	Fossils include the body remains, traces, and imprints of plants or animals that have been preserved in the Earth's crust since some past geologic or prehistoric time. Generally, to be considered a fossil, the remains must be older than recent in age (older than 10,000 years). Fossils are found in ***sedimentary rock***.
fracture	A general term for any break in a rock, or the act of breaking, whether or not it causes displacement, caused by mechanical failure from stress. Fractures include cracks, ***joints***, and ***faults***. Fractures can act as pathways for rapid ***groundwater*** movement.
free-use permit	An authorization to extract mineral materials from public lands at no charge. The BLM issues free-use permits to a federal or state agency when the materials are for use in a public project.

fuel assembly	A number of fuel elements held together by structural materials, used in a ***nuclear reactor***; sometimes called a fuel bundle.
fugitive dust	***Particulate matter*** composed of soil; can include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is removed or redistributed.
fugitive emissions	(1) Emissions that do not pass through a stack, vent, chimney, or similar opening where they could be captured by a control device. (2) Any air pollutant emitted to the atmosphere other than from a stack. Sources of fugitive emissions include pumps; valves; flanges; seals; area sources such as ponds, lagoons, landfills, piles of stored material (such as coal); and road construction areas or other areas where earthwork occurs.
gamma ray	The most penetrating type of radiant nuclear energy. It does not contain particles and can be stopped by dense materials such as concrete or lead. See ***ionizing radiation.***
geologic repository	A system for the ***disposal*** of ***radioactive*** waste in excavated geologic media, including surface and subsurface areas of operation, and the adjacent part of the geologic setting that provides ***isolation*** of the radioactive waste in a controlled area.
geotextiles	Fabrics manufactured from synthetic fiber that are used for soil reinforcement, to allow for drainage, and to control erosion.
graben	An elongated block of rock down-dropped along roughly parallel normal faults.
grade (related to a rail line)	The ratio of elevation change to the distance traveled by a train, expressed as a percent. For example, a 1-meter (3.28-foot)-change in elevation over 100 meters (328 feet) of track is a 1-percent grade.
grade-separated crossing	Occurs when a roadway and a ***rail line*** cross paths and one passes over the other via an overpass or under the other via an underpass.
grazing allotment	An area where one or more livestock operators graze their livestock. An allotment generally consists of federal land but may include parcels of private or state-owned land.
grant	Any authorization or instrument (for example, easement, lease, license, or permit) the BLM issues under Title V of the Federal Land Policy and Management Act (43 U.S.C. 1761 *et seq.*).
gray water	Non-industrial wastewater generated from domestic processes such as washing dishes, laundry, and bathing. Gray water gets its name from its cloudy appearance and from its status as being neither fresh nor heavily polluted.
groundshine	The ***radiation dose*** received from an area on the ground where ***radioactivity*** has been deposited by a ***radioactive*** plume or cloud.

gross regional product	The dollar value of all final goods and services produced in a given year in a specific region (such as the ***region of influence***).
ground vibration	The rapid linear motion of a compression wave in the ground caused by a single or repeated force or impact to the ground, as in the action of a pile driver, or a tire hitting a bump or pothole in a road.
groundwater	Water contained in pores or fractures in either the ***unsaturated*** zone or ***saturated zone*** below ground level.
habitat	Area in which a plant or animal lives and reproduces.
half-life	The time in which half the atoms of a ***radioactive*** substance ***decay*** to another nuclear form. Half-lives range from millionths of a second to billions of years depending on the stability of the nuclei.
hardpan	A layer of hard subsoil that prevents the ***infiltration*** of water or roots.
hazardous air pollutant	An air pollutant not covered by ***ambient air quality standards*** but which may present a threat of adverse human health effects or adverse environmental effects, and is specifically listed on the federal list of 189 hazardous air pollutants in 40 CFR 61.01.
hazardous chemical	As defined under the Occupational Safety and Health Act (Public Law 91-956) and the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 116), a chemical that is a physical or health hazard.
hazardous pollutant	A ***hazardous chemical*** that can cause serious health and environmental hazards; listed on the federal list of hazardous air pollutants (Clean Air Act; 42 U.S.C. 7412). See ***toxic air pollutants***.
hazardous waste	Waste that appears on the list of hazardous materials prepared by the U.S. Environmental Protection Agency or a state or local regulatory agency, or if it has characteristics defined as hazardous by such agency. If the Environmental Protection Agency does not list a material as hazardous,, it can be considered a hazardous waste if it exhibits one of the four characteristics defined in 40 CFR Part 261 Subpart C: ignitability, corrosivity, reactivity, or toxicity.
herd management area (HMA)	Areas where wild horses and burros were found on public lands when the Wild and Free-Roaming Horses and Burros Act passed in 1971. The BLM evaluates each area to determine if there is adequate food, water, cover, and space to sustain healthy and diverse wild horse and burro populations over the long term. The areas that meet these criteria are then designated herd management areas in BLM land-use plans.
heritage tourism	Heritage tourism is "the business and practice of attracting and accommodating visitors to a place or area based especially on the unique or special aspects of that locale's history, landscape (including trail systems), and culture." (Section 7 of Executive Order 13287).

hertz	A unit of frequency equal to one cycle per second.
high-level radioactive waste	(1) The highly ***radioactive*** material that resulted from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing, and any solid material derived from such liquid waste that contains ***fission products*** in sufficient concentrations.
hi-rail truck	A vehicle that is capable of traveling on roads or on railroad tracks.
historic tourism	Traveling to experience the places, artifacts, and activities that authentically represent the stories and people of the past and present.
hydric soil	Soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are used to characterize ***wetland*** conditions.
hydrogeology	A study that encompasses the interrelationships of geologic materials and processes involving water.
hydrographic area	In reference to Nevada ***groundwater***, divisions of the state into groundwater basins and sub-basins based primarily on topographic features such as mountains and valleys. The state uses the map of hydrographic areas as the basis for water planning, management, and administration. (Because they are based heavily on topographic features, hydrographic area boundaries sometimes differ from groundwater basin designations developed from studies of inferred or measured groundwater flow patterns.)
hydrology	(1) The study of water characteristics, especially the movement of water. (2) The study of water, involving aspects of geology, oceanography, and meteorology.
igneous	(1) A type of rock formed from a molten, or partially molten, material. (2) An activity related to the formation and movement of molten rock either in the subsurface (plutonic) or on the surface (***volcanic***).
impact	For an EIS, the positive or negative effect of an action (past, present, or future) on the natural ***environment*** (land use, ***air quality***, water resources, geological resources, ecological resources, aesthetic and scenic resources) and the human environment (***infrastructure***, economics, social, and cultural).
impact limiters	Devices attached to rail and truck ***shipping casks*** that would help absorb impact energy in the event of a collision.

implementing alternative	An action or proposition by DOE necessary to implement the ***Proposed Action*** and to enable the estimation of the range of reasonably foreseeable ***impacts*** of that action or proposition. In this Rail Alignment EIS, there are two implementing alternatives under the Proposed Action: 1. The Caliente Implementing Alternative, under which DOE would construct and operate the proposed ***railroad*** from in or near the City of Caliente, Nevada, westward and then southward to ***Yucca Mountain***. 2. The Mina Implementing Alternative (the non-preferred alternative), under which DOE would construct and operate the proposed railroad from Hazen, Nevada, southeastward to Yucca Mountain. Under this implementing alternative, DOE would use the existing Union Pacific Railroad Hazen Branchline from Hazen to Wabuska, Nevada, and would not perform any construction activities along this portion of the rail alignment.
in attainment	The U.S. Environmental Protection Agency designates an area as being in attainment for a particular pollutant if ***ambient*** concentrations of that pollutant are below the National ***Ambient Air Quality Standards***.
in situ	In its natural position or place. The phrase distinguishes in-place experiments, conducted in the field or underground facility, from those conducted in the laboratory.
incident-free transportation	Routine transportation in which cargo travels from origin to destination without being involved in an ***accident***.
indirect impact	An effect that is related to but removed from a ***proposed action*** by an intermediate step or process. Examples include surface-water quality changes resulting from soil erosion at construction sites, and reductions in productivity resulting from changes in soil temperature.
industrial and special wastes	Construction debris and other ***solid waste***, such as tires, that have specific management requirements for permitted landfill disposal.
industry track	A ***siding*** used by a single shipper.
infiltration	The process of water entering the soil at the ground surface and the ensuing movement downward. Infiltration becomes percolation when water has moved below the depth at which it can return to the atmosphere by evaporation or ***evapotranspiration***.
infrastructure	Basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communication systems.
Interchange Yard	The ***sidings*** where railcars containing other materials (such as materials needed for construction and operation of the proposed ***railroad*** and the ***repository***) would be decoupled from Union Pacific Railroad trains.
intermittent stream/ intermittent	A channel bed that fluctuates above or below the normal water table along its length, and may or may not have flow within it during any particular time or at

drainage	any particular location. The presence of flow within the channel is determined by its channel elevation relative to the water table, precipitation events, or snowmelt within its drainage basin.
invasive plant species	An alien species the introduction of which does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112).
ionizing radiation	(1) ***Alpha particles***, ***beta particles***, ***gamma rays***, ***X-rays***, ***neutrons***, high-speed ***electrons***, high-speed ***protons***, and other particles capable of producing ions. (2) Any ***radiation*** capable of displacing electrons from an atom or molecule, thereby producing ions.
irradiation	***Exposure*** to ***radiation***.
Isolate (related to cultural resources)	An isolated artifact occurrence that does not meet the minimum threshold to be designated a "site." Isolates are generally considered ineligible for the *National Register of Historic Places*.
isolation	Inhibiting the transport of ***radioactive*** material so that the amounts and concentrations of this material entering the ***accessible environment*** stay within prescribed limits.
isotropic	Identical in all directions.
joint	A non-tectonic fracture in the surface or linear opening in a rock.
latent	Present and capable of becoming, though not now visible, obvious, or active.
latent cancer fatality	A death that results from ***cancer*** that exposure to ***ionizing radiation*** caused. There typically is a ***latent period*** between the time of the radiation exposure and the time the cancer cells become active.
latent period	(1) The incubation period of a disease. (2) The interval between stimulation and response. (3) The interval between ***radiation exposure*** and the time a cancer becomes active.
level of service (roadway)	A qualitative measure describing operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.
lithic scatters	Concentrations of waste flakes resulting from the manufacture of stone tools.
lithology	The study and description of the general, gross physical characteristics of a rock, especially sedimentary ***clastics***, including color, grain size, and composition.
loam	A soil composed of a mixture of clay, silt, sand, and organic matter.
locomotive sanding	Area where a locomotive's sand box is filled. Trains use sand for traction.

area

long-term impact	In the Rail Alignment ***EIS***, ***impacts*** that could occur throughout and beyond the life of the ***railroad*** operations phase (up to 50 years).
lost workday cases	Incidents that result in injuries that cause the loss of work time.
low-income population	Defined in terms of U.S. Census Bureau annual statistical poverty levels, may consist of groups or individuals who live in geographic proximity to one another or who are geographically dispersed or transient (such as migrant workers or American Indians), where either type of group experiences common conditions of environmental exposure or effect.
low-level radioactive waste	***Radioactive*** waste that is not classified as ***high-level radioactive waste***, ***transuranic waste***, or byproduct tailings containing uranium or thorium from processed ore. Usually generated by hospitals, research laboratories, and certain industries.
maintenance-of-way activities	Activities to maintain the track, bridges, culverts, grade crossings, signal equipment, and communications equipment along a ***rail line***.
matrix (geology)	The solid, but porous, portion of rock.
maximally exposed individual	A hypothetical individual whose location and habits result in the highest total radiological or chemical ***exposure*** (and thus ***dose***) from a particular source for all exposure routes pathways (for example, inhalation, ingestion, direct exposure).
maximum contaminant level	Under the Safe Drinking Water Act (Public Law 93-523), the maximum permissible concentrations of specific constituents in drinking water that is delivered to any user of a public water system that serves 15 or more connections and 25 or more people; the standards established as maximum contaminant levels consider the feasibility and cost of attaining the standard.
maximum reasonably foreseeable accident	An ***accident*** characterized by extremes of mechanical (impact) forces, heat (fire), and other conditions that would lead to the highest foreseeable consequences. In general, accidents with conditions that have a chance of occurring more often than 1 in 10 million in a year are considered to be reasonably foreseeable.
mesosphere	Belt of atmosphere, just above the stratosphere, from 50 to 80 kilometers (30 to 50 miles) above the Earth's surface.
metamorphic rocks	Rocks that have undergone chemical or structural changes produced by an increase in heat and temperature or by replacement of elements by hot, chemically active fluids.
metric tons of heavy metal	Quantities of ***spent nuclear fuel*** without the inclusion of other materials such as cladding (the tubes containing the fuel) and structural materials. A metric ton is 1,000 kilograms (1.1 tons or 2,200 pounds). Uranium and other metals in spent

nuclear fuel (such as thorium and plutonium) are called heavy metals because they are extremely dense; that is, they have high weights per unit volume.

mining area — Places where prospecting or mining is known to have occurred, or where concentrations of specific types of minerals are known to exist, but which were never included within an organized mining district. Many of these areas, with continued use, have come to be called ***mining districts***.

mining claim — The description by boundaries of real property in which metal ore and/or minerals may be located. A claim on public land must be filed with the BLM or other federal agency, and the claim must be "worked" by being mined or prepared for mining within a specific period of time.

All mining claims are initially ***unpatented claims***, which give the right only for those activities necessary to exploration and mining, and last only as long as the claim is worked every year. The original mining law gave miners the opportunity to obtain patents (deeds from the government), much as farmers could obtain title under the Homestead Act. The owner of a patented claim can put it to any legal use.

mining district — An area usually designated by name with described or understood boundaries where minerals are found and mined under rules prescribed by the miners, consistent with the General Mining Law of 1872.

minority population — A community in which the percent of the population of a racial or ethnic minority is 10 points higher than the percent found in the population as a whole.

mitigation — Actions and decisions that (1) avoid ***impacts*** altogether by not taking a certain action or parts of an action, (2) minimize impacts by limiting the degree or magnitude of an action, (3) rectify the impact by repairing, rehabilitating, or restoring the ***affected environment***, (4) reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action, or (5) compensate for an impact by replacing or providing substitute resources or environments.

mixed low-level waste — ***Low-level radioactive waste*** mixed with ***hazardous wastes***; it must satisfy treatment, storage, and disposal regulations both as low-level radioactive waste and as hazardous waste.

movement corridor — A patch of wildlife habitat, generally vegetated, that joins two or more larger areas of wildlife habitat.

native plant species — With respect to a particular ***ecosystem***, a species that, other than as a result of an introduction, historically occurred, or currently occurs in that ecosystem.

naval spent nuclear fuel — ***Spent nuclear fuel*** discharged from reactors in surface ships, submarines, and training ***reactors*** operated by the U.S. Navy.

neutron — An atomic particle with no charge and an ***atomic mass*** of 1; a component of all atoms except hydrogen; frequently released as ***radiation***.

nitrogen dioxide	See ***nitrogen oxides***.
nitrogen oxides (oxides of nitrogen; NO_x)	Gases formed in great part from atmospheric nitrogen and oxygen when combustion occurs under conditions of high temperature and high pressure; a major air pollutant. Two primary nitrogen oxides, nitric oxide (NO) and ***nitrogen dioxide*** (NO_2), are noteworthy airborne ***contaminants***. Nitric oxide combines with atmospheric oxygen to produce nitrogen dioxide. Both nitric oxide and ***nitrogen dioxide*** can, in high concentration, cause lung ***cancer***. ***Nitrogen dioxide*** is a ***criteria pollutant***.
No-Action Alternative	Under the No-Action Alternative in the Nevada Rail Corridor SEIS, DOE would not construct and operate a railroad within the Mina ***rail corridor*** from Wabuska to ***Yucca Mountain***. Under the No-Action Alternative the Rail Alignment ***EIS***, DOE would not implement the ***Proposed Action*** in the Caliente or the Mina rail corridor.
nominal	(1) Of, being, or relating to a designated or theoretical size that may vary from the actual. (2) According to plan.
nonattainment area	An area that does not meet the ***ambient air quality standard*** for one or more ***criteria pollutants***. Further designations (for example, serious, moderate) describe the magnitude of the nonattainment.
non-transient, non-community public water system	A public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year.
non-native plant species	A species found in an area where it has not historically been found.
nonpoint source pollution	Pollution does not come from a single source but from many unidentifiable sources. An example of nonpoint source pollution would be urban runoff of items like oil, fertilizers, and lawn chemicals. As rainfall or snowmelt moves over and through the ground, it picks up and carries away natural and human-made pollutants. These pollutants are eventually deposited into natural bodies of water, such as lakes, rivers, wetlands, coastal waters, and underground sources of drinking water.
normal fault	A ***fault*** in which the relative displacement is along the direction of dip of the fault plane (***dip-slip fault***) where the block above the fault has moved downward in relation to the block below the fault. See ***reverse fault***.
nuclear radiation	***Radiation*** that emanates from an unstable ***atomic nucleus***.
notable drainage channels	In the Rail Alignment ***EIS***, channels with a stream order of 2 or greater based on Strahler's ordering system, with the National Hydrography Dataset as a base map.

noxious weeds	Any species of plant that is, or is likely to be, detrimental or destructive and difficult to control or eradicate.
nuclear reactor	A device in which a nuclear fission chain reaction can be initiated, sustained, and controlled to generate heat or to produce useful ***radiation***.
nuclear waste	Unusable by-products of nuclear power generation, nuclear weapons production, and research, including ***spent nuclear fuel*** and ***high-level radioactive waste***.
Nuclear Waste Technical Review Board	An independent body established within the Federal Government executive branch, created by the Nuclear Waste Policy Amendments Act of 1987 to evaluate the technical and scientific validity of activities undertaken by DOE, including site characterization activities and activities relating to the packaging or transportation of ***spent nuclear fuel*** or ***high-level radioactive waste***. Members of this Board are appointed by the President from a list prepared by the National Academy of Sciences.
nucleus	The central, positively charged, dense portion of an atom. Also known as ***atomic nucleus***.
nuclide	An atomic ***nucleus*** specified by its ***atomic weight***, ***atomic number***, and energy state; a ***radionuclide*** is a ***radioactive*** nuclide.
operations right-of-way	Property that would be obtained for operation of the proposed ***railroad***. This right-of-way would be a ***nominal*** width of 61 meters (200 feet) on either side of the centerline of the ***rail line***, but could vary at specific locations to accommodate, for example, access and maintenance roads, and drainage structures. In addition, some facilities (such as the ***Staging Yard***) would be outside the nominal width of the operations right-of-way, but DOE would also obtain rights-of-way in these areas. See ***construction right-of-way***.
ordinary high water mark	That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (33 CFR 328.3e).
other material	In the Rail Alignment EIS, material related to the construction (for example, reinforcing steel and cement) and operation (for example, ***waste packages*** and fuel oil) of the ***repository***.
outcrop	The part of a rock formation that appears at the surface of the ground.
overburden	***Geologic*** material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials.
ozone (O_3)	The triatomic (three atoms in the molecule) form of oxygen; in the ***stratosphere***, ozone protects the Earth from the sun's ***ultraviolet radiation***, but in lower levels of the atmosphere, it is an air pollutant.

package plant	Modular ***wastewater treatment*** units that can be designed to be portable. Most package plants use some type of biological treatment, which can be based on aerobic, anaerobic, or anoxic conditions and use attached or suspended organisms. Other processes incorporated into package plants can include membrane filtration and disinfection by chlorine, ultraviolet light, or ***ozone***.
particulate matter	Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions. See PM_{10}.
peak particle velocity	The maximum instantaneous positive or negative peak of the vibration signal, measured as a distance per time (such as millimeters or inches per second). This measurement has been used historically to evaluate shock-wave type vibrations from actions like blasting, pile driving, and mining activities, and their relationship to building damage.
pending annual duty	See ***duty***.
perceived risk and stigma	DOE uses the term risk perception to mean how an individual perceives the amount of risk from a certain activity. Studies show that perceived risk varies with certain factors, such as whether the exposure to the activity is voluntary, the individual's degree of control over the activity, the severity of the exposure, and the timing of the consequences of the exposure. DOE uses stigma to mean an undesirable attribute that blemishes or taints an area or locale.
perennial stream	A stream that receives ***groundwater*** into its channel and its streambed is normally below the water table. During years with normal precipitation, a perennial stream will have constant flow.
perennial yield	The estimated quantity of ***groundwater*** that can be withdrawn annually from a ***hydrographic area*** without depleting the ***aquifer***. The Nevada State Engineer uses the perennial yield estimate as a guideline by which to limit groundwater allocations.
permeability	In general terms, the capacity of such mediums as rock, sediment, and soil to transmit liquid or gas. Permeability depends on the substance transmitted (oil, air, water, etc.) and on the size and shape of the pores, ***joints***, and ***fractures*** in the medium and the manner in which they interconnect. "Hydraulic conductivity" is equivalent to "permeability" in technical discussions relating to ***groundwater***.
permeable	Pervious; a permeable rock is a rock, either porous or cracked, that allows water to soak into and pass through it freely.
person-rem	A unit used to measure the ***radiation exposure*** to an entire group and to compare the effects of different amounts of radiation on groups of people; it is the product of the average ***dose equivalent*** (in ***rem***) to a given organ or tissue multiplied by the number of persons in the population of interest.
petroglyph	A carving or inscription on a rock; rock art.

pH	A measure of the relative acidity or ***alkalinity*** of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (that is, alkaline) solutions have pH values higher than 7.0.
plate girder bridge	A typical bridge constructed across short spans. It usually looks like a u-shape in cross section, with two steel plates supporting each side of the bridge.
playa	A nearly level area at the bottom of a ***desert*** basin that does not drain to a river and is temporarily covered with water from heavy rains or snowmelts. Normally a dry lakebed that may contain water in response to seasonally high runoff.
pluvial lakes	Lakes that increase in size and depth as a result of increased precipitation and decreased evaporation, characteristic of past environmental conditions that were cooler and wetter than today.
PM_{10}	All ***particulate matter*** with an aerodynamic diameter less than or equal to a nominal 10 micrometers. Particles less than this diameter are small enough to be breathable and could be deposited in lungs.
$PM_{2.5}$	All ***particulate matter*** with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
population dose	A summation of the ***radiation doses*** received by individuals in an exposed population; equivalent to ***collective dose***; expressed in ***person-rem***.
pressurized-water reactor (PWR)	A ***nuclear*** power ***reactor*** that uses water under pressure as a coolant. The water boiled to generate steam is in a separate system.
prime farmland	Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or ***alkalinity***, an acceptable content of salt and sodium, and few or no rocks. Its soils are ***permeable*** to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding.
primordial radionuclides	***Radionuclides*** that originate mainly from the interiors of stars and are still present because their ***half-lives*** are so long that they have not yet completely ***decayed***.

probability	The relative frequency at which an event can occur in a defined period. Statistical probability is what happens in the real world and can be verified by observation or sampling. Knowing the exact probability of an event is usually limited by the inability to know, or compile the complete set of, all possible outcomes over time or space. Probability is measured on a scale of 0 (event will not occur) to 1 (event will occur).
Proposed Action	The activity proposed to accomplish a federal agency's purpose and need. An ***EIS*** analyzes the environmental ***impacts*** of a proposed action, which includes the project and its related support activities. The Proposed Action in the Nevada Rail Corridor SEIS is to construct and operate a railroad to connect the Yucca Mountain repository to an existing ***rail line*** near Wabuska, Nevada (the Mina ***rail corridor***). The Proposed Action in the Rail Alignment EIS, is to determine an alignment (within a corridor) and construct and operate a railroad in Nevada to transport ***spent nuclear fuel***, ***high-level radioactive waste***, and other ***Yucca Mountain*** project materials to a repository at Yucca Mountain.
proton	An elementary particle that is the positively charged component of ordinary matter and, together with the ***neutron***, is a building block of all ***atomic*** nuclei.
public lands	As defined in Public Law 94-79, public lands are any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the BLM. In common usage, public lands may refer to all federal land no matter what agency has responsibility for its management.
public land order	An order affecting, modifying, or canceling a withdrawal or reservation that has been issued by the Secretary of the Interior pursuant to powers of the President delegated to the Secretary by Executive Order 9146 of April 24, 1942, or 9337 of April 24, 1943.
public water system	A water system that provides water for human consumption for an average of at least 25 persons per day (or 15 or more service connections) and in use for at least 60 days each year.
pyroclastic	Of or relating to individual particles or fragments of ***clastic*** rock material of any size formed by volcanic explosion or ejected from a volcanic vent.
qualitative	With regard to a variable, a parameter, or data, an expression or description of an aspect in terms of non-numeric qualities or attributes. See ***quantitative***.
quantitative	A numeric expression of a variable. See ***qualitative***.
rad	A unit of absorbed radiation dose in terms of energy. One rad equals 100 ergs of energy absorbed per gram of tissue.

radiation	The emitted particles or ***photons*** from the nuclei of radioactive atoms. Some elements are naturally ***radioactive***; others are induced to become radioactive by ***irradiation*** in a reactor. Naturally occurring radiation is indistinguishable from induced radiation.
radioactive	Emitting ***radioactivity***.
radioactivity	The property possessed by some elements (for example, uranium) of spontaneously emitting ***alpha, beta***, or ***gamma rays*** by the disintegration of ***atomic*** nuclei.
radionuclide	See ***nuclide***.
radiotoxicity	Of, relating to, or being a ***radioactive*** substance that is toxic to living cells or tissues.
radius of influence	The distance from the well where the drawdown becomes insignificant and can be neglected.
rail alignment	An engineered refinement of a ***rail corridor*** in which DOE would identify the location of a ***rail line***. A rail alignment is comprised of ***common segments*** and ***alternative segments***.
rail corridor	As used in this Rail Alignment EIS, a strip of land, 400 meters (0.25 mile) wide through which DOE would identify an alignment (***rail alignment***) for the construction of a ***rail line*** in Nevada to a ***geologic repository*** at ***Yucca Mountain***.
Rail Equipment Maintenance Yard	The rail yard that would be near the ***geologic repository*** and would temporarily store, service, and maintain railcars and locomotives in preparation for the return trip to the ***Staging Yard***.
rail line	An engineered feature incorporating the track, ties, ***ballast***, and ***subballast*** at a specific location.
rail route	Route from point of origin to the ***repository***.
railroad	A transportation system incorporating the ***rail line***, operations support facilities, railcars, locomotives, and other related property and infrastructure.
Nevada Railroad Control Center	A facility that would control all train movements, rail operations, and emergency response operations along the proposed ***railroad*** in Nevada to ***Yucca Mountain***.
rain shadow	Effect that occurs when moist air is blown toward a mountain and the air rises, cools, and releases its moisture as rain or snow. When the air passes to the other side of the mountain, it is dry and does not release moisture. If the wind always blows the same way, the area on the dry side of the mountain is said to be in a rain shadow.

reactor	See ***nuclear reactor***.
real disposable income	The value of total income received after taxes; it is the income available for spending or saving; also referred to as ***real disposable personal income***.
real disposable personal income	See ***real disposable income***.
recharge	The movement of water from an ***unsaturated zone*** to a ***saturated zone***.
Record of Decision	A document that provides a concise public record of a decision made by a government agency.
recordable cases	Occupational injuries or occupation-related illnesses that result in (1) a fatality, regardless of the time between the injury or the onset of the illness and death, (2) ***lost workday cases*** (nonfatal), and (3) the transfer of a worker to another job, termination of employment, medical treatment, loss of consciousness, or restriction of motion during work activities.
region of influence	The physical area that bounds the environmental, sociologic, economic, or cultural features of interest for the purpose of analysis.
rem	A unit of ***dose equivalent***. The dose equivalent in rems equals the absorbed dose in ***rads*** in tissue multiplied by the appropriate quality factor and possibly other modifying factors. Derived from roentgen equivalent man, referring to the dosage of ionizing ***radiation*** that will cause the same biological effect as one roentgen of ***X-ray*** or ***gamma ray*** exposure. One rem equals 0.01 sievert.
remediation	Action taken to permanently remedy a release or threatened release of a hazardous substance to the ***environment***, instead of or in addition to removal.
repository	See ***geologic repository***.
resource management plan	A land-use plan for public lands as described by the Federal Land Management and Policy Act. Among other things, it establishes land areas for limited, restricted, or exclusive use; allowable resource uses; resource condition goals and objectives; general management practices to achieve the goals; the need for more specific management plans for certain areas; general implementation sequences; and monitoring intervals and standards.
reverse fault	A ***fault*** in which the relative displacement is along the direction of the dip of the fault plane (***dip-slip fault***), and in which the block above the fault has moved upward in relation to the block below the fault.
right-of-way grant	Authorization from the BLM to use a specific portion of public land for construction and operation of the proposed ***railroad***. The land covered by the right-of-way grant would include the area of construction, known as the ***construction right-of-way*** and the area of operations known as the ***operations right-of-way***.

riparian	Of, on, or pertaining to, the bank of a river or stream, or of a pond or small lake.
riprap	Broken rocks or chunks of concrete used as foundation material or to protect embankments and gullies to control water flow or prevent erosion.
risk	The product of the ***probability*** that an undesirable event will occur multiplied by the consequences of the undesirable event.
roadbed	The earthwork foundation upon which the track, ties, ***ballast***, and ***subballast*** of a ***rail line*** are lain.
root mean-square velocity	An average or smoothed vibration amplitude, commonly measured over 1-second intervals. It is expressed on a log scale in ***decibels (VdB)*** referenced to 0.000001 (10^{-6}) inch per second and is not to be confused with noise ***decibels***.
sand sheets	Large, irregularly shaped, commonly thin, surficial mantles of windblown sand that lack the discernible slip faces that are common on dunes.
sanitary and industrial solid waste	***Solid waste*** that is neither ***hazardous*** nor ***radioactive.*** Sanitary waste streams include paper, glass, and discarded office material. State of Nevada waste regulations identify this waste stream as household waste.
sanitary waste	Domestic wastewater from toilets, sinks, showers, kitchens, and floor drains from restrooms, change rooms, and food preparation and storage areas.
saturated zone	The area below the ***water table*** where all spaces (***fractures*** and rock pores) are completely filled with water.
scenic quality	A measure of the visual appeal of a tract of land. Areas are rated from A to C based on key factors including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. An A rating is assigned to areas that combine the most outstanding characteristics of each category, whereas a C rating is assigned to areas common to the region.
screened (related to water wells)	The portion of a well that is screened is the interval in the well where the casing contains slots to let in the water from the primary (most productive) water-bearing zone or zones.
sedimentary rocks	Rock formed by the accumulation of sediment in water or land. Sandstone, chert, limestone, dolomite, shale, siltstone, and mudstone are types of sedimentary rocks that are found in the Great Basin. They are differentiated by chemistry, deposition, and texture.
seismic	Pertaining to, characteristic of, or produced by, earthquakes or earth vibrations.
seismicity	A ***seismic*** event or activity such as an ***earthquake*** or earth tremor; seismic action.
semi-desert	An ***arid*** area that has some of the characteristics of a ***desert*** but has greater annual precipitation.

sensitive receptors	As used in this Rail Alignment EIS, any specific resource (population or facility) that would be more susceptible to the effects of the ***impact*** of implementing the ***Proposed Action*** than would otherwise be.
sensitive structures	Buildings or structures, usually old and of cultural value, or facilities that house vibration-sensitive equipment, that could be susceptible to ***ground vibrations,*** activities, or conditions causing ***ground vibrations***.
sensitivity levels	A measure of public concern for ***scenic quality***. Areas are ranked high, medium, or low based on types of users, amount of use, public interest, adjacent land uses, and whether they are special areas.
Shared-Use Option	An option under the ***Proposed Action***. DOE would allow commercial and other shippers to use the ***rail line*** for general freight shipments. General freight would include stone and other nonmetallic minerals, petrochemicals, waste materials (nonradioactive), or other commodities that private companies would ship or receive.
short-term impact	In the Rail Alignment EIS, impacts limited to the construction phase (4 to 10 years).
shielding	Any material that provides ***radiation*** protection.
shipment	The movement of a properly prepared (loaded, unloaded, or empty) ***cask*** from one site to another and associated activities to ensure compliance with applicable regulations.
shipping cask	A heavily shielded, massive container that meets regulatory requirements for shipping ***spent nuclear fuel*** and ***high-level radioactive waste***. See ***cask***.
siding	A track that runs parallel to the main line for a short distance and is used for passing and overtaking trains to prevent backups and keep traffic flowing.
signal blocks	A ***rail line*** bounded on one end by an entry signal and on the other end by an exit signal. The proposed ***railroad*** would be divided into a number of signal blocks, which would allow for easier control of trains along the railroad.
site characterization	Activities associated with the determination of the suitability of the ***Yucca Mountain Site*** for a ***geologic repository***.
soft soils	Soils with saline conditions that limit the chemical and physical potentials of the soil and that could have negative effects on the vegetation-bearing capacity of the soil. These soils would have a higher potential for erosion until revegetation was complete.
soil recovery	The return of disturbed land to a relatively stable condition with a form and productivity similar to that which existed before any disturbance.
solid waste	For purposes of this analysis, defined as nonhazardous general household waste.

source term Types and amounts of ***radionuclides*** that are the source of a potential release of ***radioactivity***.

Special Areas Defined in BLM Visual Resource Inventory Manual 8410 as lands where measures must be taken to protect visual values. Special Areas often include designated natural areas, ***Wilderness Study Areas***, scenic rivers, and scenic roads. Special Areas are not necessarily unique or picturesque, but the management objective for a Special Area is to preserve its natural characteristics.

spent nuclear fuel

1. ***Nuclear reactor*** fuel that has been used to the extent that it can no longer effectively sustain a chain reaction.
2. Fuel that has been withdrawn from a nuclear reactor after ***irradiation***, the component elements of which have not been separated by reprocessing. For this project, this refers to:
   a. Intact, nondefective ***fuel assemblies***
   b. Failed fuel assemblies in ***canisters***
   c. Fuel assemblies in canisters
   d. Consolidated fuel rods in canisters
   e. Nonfuel assembly hardware inserted in ***pressurized-water reactor*** fuel assemblies
   f. Fuel channels attached to ***boiling-water reactor*** fuel assemblies
   g. Nonfuel assembly hardware and structural parts of assemblies resulting from consolidation in canisters

splay faults Minor faults that branch off of a primary fault, or interconnect to form a fault zone.

spoils areas Areas outside the ***rail corridor*** for the deposition of excavated materials from ***rail line*** development.

Staging Yard The rail yard that would temporarily store, service, and maintain railcars and locomotives in preparation for a trip to the ***Rail Equipment Maintenance Yard*** inside the ***Yucca Mountain Site boundary*** near the ***repository*** operations area, or in preparation for return to the Union Pacific Railroad. Railcars containing ***casks*** would be decoupled from Union Pacific Railroad trains in preparation for the trip to the repository.

stakeholder A person or organization with an interest in, or affected by, DOE actions (for example, representatives from federal, state, tribal, or local agencies; members of Congress or state legislatures; unions, educational groups, environmental groups, industrial groups; and members of the general public).

State protected species
: Animals classified under Nevada Administrative Code, Section 503.103, as meeting the Endangered Species Act definition or the State population being in danger of extinction. Under Nevada Administrative Code 527.020, a plant species is classified as being in danger of extinction if its survival requires assistance because of overexploitation, disease, or other factors or because its habitat is threatened with destruction, drastic modification, or severe curtailment.

stigma
: See ***perceived risk and stigma***.

storage
: The collection and containment of waste or ***spent nuclear fuel*** in a way that does not constitute ***disposal*** of the waste or spent nuclear fuel for the purposes of awaiting treatment or disposal capacity.

stratigraphy
: The branch of geology that deals with the definition and interpretation of rock strata, the conditions of their formation, character, arrangement, sequence, age, distribution, and especially their correlation, by the use of ***fossils*** and other means of identification.

stratosphere
: The atmospheric shell above the ***troposphere*** and below the ***mesosphere***. It extends from 10 to 20 kilometers (6 to 12 miles) to about 53 kilometers (33 miles) above the Earth's surface.

stratum
: A sheet like mass of ***sedimentary rock*** or earth of one kind lying between beds of other kinds.

subballast
: A layer of crushed gravel that is used to separate the ***ballast*** and ***roadbed*** for the purpose of load distribution and drainage.

subgrade elevation
: The elevation of the top of the ***subballast*** in the ***rail line***.

substrate
: Basic surface on which a material adheres.

sulfur dioxide (SO_2)
: A pungent, colorless gas produced during the burning of sulfur-containing fossil fuels. It is the main pollutant involved in the formation of acid rain. Coal- and oil-burning electric utilities are the major source of sulfur dioxide in the United States. Inhaled sulfur dioxide can damage the human respiratory tract and can severely damage vegetation. See ***criteria pollutants***, ***ambient air quality standards***.

sulfur oxides
: A mixture of ***sulfur dioxide***, sulfur trioxide, and inorganic sulfites and sulfates. Sulfur dioxide combines with oxygen in the air to form sulfur trioxide and microscopic aerosol sulfite and sulfate particles, all of which are lung irritants. See ***criteria pollutants***, ***ambient air quality standards***.

surface entry	The appropriation of any non-federal interests or claims (other than mining claims), land sales, BLM land exchanges, state selections, Desert Land Entries, Indian Allotments, Carey Act selections, or any other like public land disposal actions. Surface entry does not include ***rights-of-way***, granted pursuant to Title V of the Federal Land Policy and Management Act, and other easements, leases, licenses, and/or use permits.
sustained yield	The amount of water that may be pumped from a ***hydrographic area*** during a specific period of time without affecting future yields. Equal to ***recharge***, and independent of economic feasibility and management objectives.
team track	A track on which rail cars would be placed for public use to load or unload freight.
tectonic plate	A piece of Earth's outer shell that moves across the mantle.
thermal desorption	The use of heat to remove an absorbed substance from a liquid or gas environment, including soil.
threatened species	A species that is likely to become an ***endangered species*** within the foreseeable future throughout all or a significant part of its range.
thrust fault	A ***fault*** that occurs when squeezing forces push the block above an inclined fault up in relation to the other block.
total employment	The sum of direct and indirect employment resulting from initiation of an activity. Direct employment consists of jobs performing the activity. Indirect employment consists of jobs in other activities supporting the direct employees. Also defined as composite employment.
total population	The sum of all people associated with direct and indirect employees and their families resulting from initiation of an activity.
toxic air pollutant	A ***hazardous chemical*** that can cause serious health and environmental hazards; listed on the federal list of ***hazardous air pollutants*** (Clean Air Act; 42 U.S.C. 7412).
traditional cultural property	A property that is eligible for inclusion in the *National Register of Historic Places* because of its association with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community. Culture includes the traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, whether an American Indian tribe, a local ethnic group, or the people of the Nation as a whole. Properties can include buildings, structures, and sites; groups of buildings, structures, or sites forming historic districts; and individual objects.
transpiration	The process by which water enters a plant through its root system, passes through its vascular system, and is released into the atmosphere through openings in its outer covering. It is an important process for removal of water

that has infiltrated below the zone where it could be removed by evaporation.

transuranic waste	Waste materials (excluding ***high-level radioactive waste*** and certain other waste types) contaminated with alpha-emitting ***radionuclides*** that are heavier than uranium with half-lives greater than 20 years and that occur in concentrations greater than 100 nanocuries per gram. Transuranic waste results primarily from treating and fabricating plutonium, and research activities at DOE defense installations.
troposphere	The lowest layer of the atmosphere; it contains about 95 percent of the mass of air in the Earth's atmosphere. The troposphere extends from the Earth's surface up to about 10 to 15 kilometers (7 to 9 miles).
tuff	***Igneous*** rock formed from compacted volcanic fragments from ***pyroclastic*** (explosively ejected) flows with particles generally smaller than 4 millimeters (about 0.16 inch) in diameter. Nonwelded tuff results when volcanic ash cools in the air sufficiently that it does not melt together, yet later becomes rock through compression.
ultraviolet radiation	Electromagnetic ***radiation*** with wavelengths from 4 to 400 nanometers. This range begins at the short wavelength limit of visible light and overlaps the wavelengths of long ***X-rays*** (some scientists place the lower limit at higher values, up to 40 nanometers). Also known as ultraviolet light.
uncertainty	A measure of how much a calculated or estimated value that is used as a reasonable guess or prediction might vary from the unknown true value.
unique farmland	Land other than ***prime farmland*** that is used for the production of specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.
unpatented mining claim	See ***mining claim***.
unsaturated zone	The zone of soil or rock below the ground surface and above the ***water table***.
viewshed	A total field of vision or a vista. In particular, an area with visual boundaries seen from various points within the area.
vitrification	A waste treatment process that uses glass (for example, ***borosilicate glass***) to encapsulate or immobilize ***radioactive*** wastes.
volatile organic compound (VOC)	Organic chemical compounds that have high enough vapor pressures under normal conditions to significantly vaporize and enter the atmosphere.
volcanic rock	Rocks that have been ejected at or near the Earth's surface. ***Tuffs***, lava flows, volcanic breccias, basalt, andesite, and rhyolite are types of volcanic rocks that are found in the Great Basin. They are differentiated by chemistry and texture.

wash	The dry streambed of an ***intermittent*** or ***ephemeral stream***. In the Nevada Rail Corridor SEIS and the Rail Alignment EIS, wash is used interchangeably with intermittent and ***ephemeral streams***.
waste form	A generic term that refers to the different types of ***radioactive*** wastes.
waste package	A container that consists of the barrier materials and internal components into which DOE would place the ***canisters*** that contained ***spent nuclear fuel*** and ***high-level radioactive waste*** at the ***repository***.
waste packages	Two thick metal cylinders, one nested within the other. The inner cylinder would be made of stainless steel to provide structural strength. The outer cylinder would be made of a nickel alloy that is highly resistant to corrosion.
wastewater treatment	A process that typically involves three stages (called primary, secondary, and tertiary treatment). First, the solids are separated from the wastewater. Next, dissolved biological matter is progressively converted into a solid mass using indigenous water-borne bacteria. Finally, the biological solids are neutralized and then disposed of or re-used, and the treated water can be disinfected chemically or physically (such as by lagooning and micro-filtration). The final effluent can be discharged into a natural surface-water body or other environment.
water table	(1) The upper limit of the ***saturated zone*** (the portion of the ground wholly saturated with water). (2) The upper surface of a zone of saturation above which most pore spaces and ***fractures*** are less than 100-percent saturated with water most of the time (***unsaturated zone***) and below which the opposite is true (saturated zone).
waters of the United States	Streams, drainages, or washes under the jurisdiction of the U.S. Army Corps of Engineers under the Clean Water Act as defined at 33 CFR 328.3a. The U.S. Army Corps of Engineers and U.S. Environmental Protection Agency regulate the placement of dredged or fill material into these waters. The definition incorporates channels with ***ephemeral*** and intermittent flow that exhibit specific physical features, including channel shape and surrounding vegetation that would provide indications of an ***ordinary high water mark***.
wayside signal	Any signal of fixed location outside the train alongside the track.
welded tuff	A ***tuff*** deposited under conditions in which the particles making up the rock were heated sufficiently to cohere. In contrast to nonwelded tuff, welded tuff is denser, less porous, and more likely to be ***fractured*** (which increases ***permeability***).
wetland	Areas inundated or saturated by surface- or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wilderness Study Area	Areas of public lands the BLM has formally identified as having wilderness characteristics. These areas are protected by Congress, until Congress either designates them as an official Wilderness Area or removes them from any wilderness designation.
wildlife guzzler	A water development for wildlife that relies on rainfall or snowmelt to recharge it, rather than springs or streams. Usually used where there are no other sources of water for wildlife.
withdrawal	Related to land use: Withholding an area of federal land from settlement, sale, location, or surface entry, under some or all of the general land laws, for the purpose of limiting activities under those laws to maintain other public values in the area or reserving the area for a particular public purpose or program. Related to water resources: Water diverted from the ground or diverted from a surface-water source for use.
worker year	Two-thousand hours of paid labor; a project requiring 1.5 worker years would take 3,000 hours to complete.
wye track	A triangular shaped arrangement of tracks with a switch at each corner. With a sufficiently long track leading away from each corner, a train of any length can be turned.
X-rays	Penetrating electromagnetic ***radiation*** having a wavelength much shorter than that of visible light. X-rays are identical to ***gamma rays*** but originate outside the ***nucleus***, either when the inner orbital ***electrons*** of an excited atom return to their normal state or when a metal target is bombarded with high-speed electrons.
Yucca Mountain Site	The area inside the site boundary over which DOE has control.
Yucca Mountain Site boundary	The outer limit of the 600-square-kilometer (150,000-acre) area shown on figures in this Rail Alignment EIS, assumed, for purposes of analysis, to be the area of federal property set aside for the exclusive use of DOE for the repository project.

DOE used the Document Input Reference System (DIRS) to manage references for the document. The unique number assigned by this system has been used in text and in this Reference List to aid the reader in identifying source documents.

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176978	MO0604GISBLCAM.000	MO0604GISBLCAM.000. BLM, Lincoln County Conservation, Recreation, and Development Act Map. Submittal date: 04/05/2006.
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177710	MO0607NHDWBDYD.000	MO0607NHDWBDYD.000. National Hydrological Dataset Waterbody Information for the State of Nevada. Submittal date: 07/18/2006.
177291	MO0607NPWINFSN.000	MO0607NPWINFSN.000. Non Permitted Well Information for the State of Nevada. Submittal date: 07/18/2006.
177293	MO0607PWMAR06D.000	MO0607PWMAR06D.000. Two New Existing Wells Within Dry Lake Valley. Submittal date: 07/18/2006.
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174399	MO9901COV97208.000	MO9901COV97208.000. Coverage: NVLNDCVU. Submittal date: 01/21/1999.

APPENDIX A

FEDERAL REGISTER NOTICES

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APPENDIX A

FEDERAL REGISTER NOTICES

This appendix contains copies of *Federal Register* (*FR*) notices applicable to *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor* (DOE/EIS-0250F-S2D) and *Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0369D).

A.1 68 *FR* 74951, December 29, 2003

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DEPARTMENT OF ENERGY

Notice of Preferred Nevada Rail Corridor

AGENCY: Office of Civilian Radioactive Waste Management, U.S. Department of Energy.

ACTION: Notice of the Preferred Nevada Rail Corridor.

SUMMARY: On July 23, 2002, the President signed into law (Pub. L. 107–200) a joint resolution of the U.S. House of Representatives and the U.S. Senate designating the Yucca Mountain site in Nye County, Nevada, for development as a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste. The Department of Energy (DOE or Department) is now responsible for planning and implementing a transportation program for the shipment of spent nuclear fuel and high-level radioactive waste, in the event the Nuclear Regulatory Commission authorizes receipt and possession of spent nuclear fuel and high-level radioactive waste at Yucca Mountain.

In the Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS–0250F) (Final EIS), the Department evaluated various modes of transportation including mostly rail, mostly legal-weight truck and mostly heavy-haul truck. The Department identified the mostly rail alternative as its preferred mode of transportation in the Final EIS.

In the event that DOE selects the mostly rail alternative, a rail line would need to be constructed to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada. Accordingly, the Final EIS evaluated five rail corridors [1]—Caliente, Carlin, Caliente-Chalk Mountain, Jean, and Valley Modified. The Department, however, did not identify a preferred rail corridor in the Final EIS, but indicated it would do so at least 30 days before making any decisions on the selection of a corridor.

The Department is now announcing the Caliente rail corridor as its preferred corridor in which to construct a rail line in Nevada, and Carlin as a secondary preference. If the Department adopts the mostly rail mode in Nevada, DOE will issue a Record of Decision selecting a rail corridor no sooner than 30 days after publication of this preference announcement. If the Department selects a rail corridor, DOE will issue a Notice of Intent in the **Federal Register** to initiate the preparation of a rail alignment EIS under the National Environmental Policy Act (NEPA) to consider alternative alignments within the selected corridor for construction of a rail line. Under this scenario, the Department would anticipate holding public scoping meetings in early-to-mid February, 2004. The exact date, time and locations of the meetings would be announced in the Notice of Intent.

FOR FURTHER INFORMATION CONTACT:

To obtain a copy of the Final EIS or for further information contact: Ms. Robin Sweeney, Office of National Transportation, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 011, Las Vegas, NV 89134, Telephone 1–800–967–3477. The Final EIS is available on the Internet at *ocrwm.doe.gov*.

For further information regarding the DOE NEPA process contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (EH–42), U.S. Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585, Telephone (202) 586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

In the Final EIS, DOE analyzed a Proposed Action to construct, operate and monitor, and eventually close a geologic repository at Yucca Mountain. As part of the Proposed Action, DOE analyzed the potential impacts of transporting spent nuclear fuel and high-level radioactive waste from 72 commercial and 5 DOE sites to the Yucca Mountain site.[2] Transportation

[1] A corridor is a strip of land, approximately 400 meters (0.25 mile) wide, that encompasses one of several possible routes through which DOE could build a branch rail line. An alignment is the specific location of a rail line in a corridor.

[2] Additional sites (primarily research reactors) will ship spent nuclear fuel to DOE for disposal at the repository. Shipment from these sites to DOE is covered under a separate Environmental Impact Statement, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environment Restoration and Waste Management Programs Environmental Impact Statement* (DOE/EIS–0203; April 1995), and associated Record of Decision (June 1, 1995; 60 FR 28680)). Two of these research reactors were recently closed and the spent fuel removed. Adding

Continued

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could be accomplished using a variety of modes, including legal-weight truck, rail, heavy-haul truck, and possibly barge.

The Final EIS examined various national transportation scenarios and Nevada transportation implementing alternatives to estimate the range of potential environmental impacts that could occur. Two national transportation scenarios, referred to as the mostly legal-weight truck[3] scenario and the mostly rail[4] scenario, and three Nevada implementing alternatives, referred to as the legal-weight truck alternative, the rail alternative, and the heavy-haul truck[5] alternative are evaluated. In the Final EIS, the Department identified the mostly rail scenario as its preferred mode of transportation, both nationally and in the State of Nevada.

Implementation of the mostly rail scenario would require the construction of a rail line to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada. Accordingly, the Final EIS evaluated five rail corridors—Caliente, Carlin, Caliente-Chalk Mountain[6], Jean and Valley Modified. The Department, however, did not identify a preferred rail corridor in the Final EIS.

Preferred Nevada Rail Corridor

After consideration of public comments, the analyses of the Final EIS and other information, the Department has identified the Caliente corridor as its preferred rail corridor with the Carlin Corridor as the secondary preference. The Department's preference for Caliente takes into consideration many factors, including its more remote location, the diminished likelihood of land use conflicts, concerns raised by Nevadans, and national security issues raised by the U.S. Air Force on the Caliente-Chalk Mountain corridor. Approximately one-third of the Caliente and Carlin corridors overlap. Since the Carlin corridor has similar attributes overall, DOE has identified the Carlin corridor as the secondary preference in the event the Caliente corridor is not selected.

If the Department adopts the mostly rail mode, DOE will issue a Record of Decision selecting a rail corridor no sooner than 30 days after publication of this preference announcement. If the Department selects a rail corridor, DOE will issue a Notice of Intent in the **Federal Register** to initiate the preparation of a rail alignment EIS under NEPA to consider alternative alignments within the selected corridor for construction of a rail line.

Issued in Washington, DC, December 23, 2003.

Margaret S.Y. Chu,

Director, Office of Civilian Radioactive Waste Management.

[FR Doc. 03–32029 Filed 12–24–03; 8:45 am]

BILLING CODE 6450–01–P

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these sites to the 77 sites listed above results in a total of 129 sites with spent nuclear fuel or high-level waste destined for repository disposal.

[3] A truck with a gross vehicle weight (truck and cargo) of less than 80,000 pounds having dimensions, axle spacing, and if applicable, axle loads within Federal and state limits.

[4] Rail is defined to include vehicles, such as locomotives and specialized freight cars, with steel wheels running on steel rails using standard gauge that is compatible with the U.S. freight rail network.

[5] A heavy-haul truck is an overweight, overdimension vehicle that must have permits from state highway authorities to use public highways. An intermodal transfer station is a facility at the junction of rail and road transportation used to transfer shipping casks containing radioactive materials from rail to truck, and empty casks from truck to rail.

[6] As stated in the Final EIS, DOE considers the Caliente-Chalk Mountain rail corridor to be non-preferred, because of adverse effects on the security and operations of the Nevada Test and Training Range.

A.2 68 FR 74965, December 29, 2003

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DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NV–930–1430–ET; NVN–77880; 4–08807]

Notice of Proposed Withdrawal and Opportunity for Public Meeting; Nevada

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice.

SUMMARY: The Bureau of Land Management has received a request from the Department of Energy to withdraw 308,600 acres of public land from surface entry and mining for a period of 20 years to evaluate the land for the potential construction, operation, and maintenance of a branch rail line for the transportation of spent nuclear fuel and high-level radioactive waste in the event the Nuclear Regulatory Commission authorizes a geologic repository at Yucca Mountain as provided for under the Nuclear Waste Policy Act of 1982, as amended. This notice segregates the land from surface entry and mining for up to 2 years while various studies and analyses are made to support a final decision on the withdrawal application.

DATES: Comments and requests for a meeting should be received on or before March 29, 2004.

ADDRESSES: Comments and meeting requests should be sent to the Nevada State Director, BLM, 1340 Financial Blvd., PO Box 12000, Reno, Nevada 89520–0006.

FOR FURTHER INFORMATION CONTACT: Dennis J. Samuelson, BLM Nevada State Office, 775–861–6532.

SUPPLEMENTARY INFORMATION: The Department of Energy has filed an application (NVN 77880) to withdraw the following described public land from settlement, sale, location, or entry under the general land laws, including the mining laws and the mineral leasing laws, subject to valid existing rights:

Mount Diablo Meridian

A corridor one mile in width that contains a portion of, or are wholly encompassed within, the following sections:

10S 46E 01	1N 55E 24	2N 58E 03	3N 48E 35	4N 49.2E 35
10S 46E 02	1N 55E 25	2N 58E 04	3N 48E 36	4N 49.2E 36
10S 46E 12	1N 55E 26	2N 58E 05	3N 49E 02	4N 49E 24
10S 46E 13	1N 55E 27	2N 58E 07	3N 49E 03	4N 49E 25
10S 47E 06	1N 55E 28	2N 58E 08	3N 49E 04	4N 49E 26
10S 47E 07	1N 55E 29	2N 58E 09	3N 49E 05	4N 49E 33
10S 47E 08	1N 55E 30	2N 58E 13	3N 49E 07	4N 49E 34
10S 47E 09	1N 55E 31	2N 58E 17	3N 49E 08	4N 49E 35
10S 47E 15	1N 55E 32	2N 58E 18	3N 49E 09	4N 49E 36
10S 47E 16	1N 55E 33	2N 58E 19	3N 49E 10	4N 50E 30
10S 47E 17	1N 56E 01	2N 58E 20	3N 49E 17	4N 50E 31
10S 47E 18	1N 56E 02	2N 58E 21	3N 49E 18	4N 50E 32

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10S 47E 21	1N 56E 09	2N 58E 22	3N 49E 19	4N 60E 20
10S 47E 22	1N 56E 10	2N 58E 23	3N 50E 02	4N 60E 21
10S 47E 23	1N 56E 11	2N 58E 24	3N 50E 03	4N 60E 22
10S 47E 26	1N 56E 12	2N 58E 25	3N 50E 04	4N 60E 23
10S 47E 27	1N 56E 13	2N 58E 26	3N 50E 10	4N 60E 24
10S 47E 28	1N 56E 14	2N 58E 27	3N 50E 11	4N 60E 25
10S 47E 34	1N 56E 15	2N 58E 28	3N 50E 14	4N 60E 26
10S 47E 35	1N 56E 16	2N 58E 29	3N 50E 15	4N 60E 27
11S 47E 01	1N 56E 17	2N 58E 30	3N 50E 22	4N 60E 28
11S 47E 02	1N 56E 18	2N 58E 31	3N 50E 23	4N 60E 29
11S 47E 03.	1N 56E 19	2N 58E 32	3N 50E 24	4N 60E 31
11S 47E 11	1N 56E 20	2N 59E 02	3N 50E 25	4N 60E 32
11S 47E 12	1N 56E 21	2N 59E 03	3N 50E 26	4N 60E 33
11S 47E 13	1N 57E 03	2N 59E 04	3N 50E 35	4N 61E 19
11S 47E 14	1N 57E 04	2N 59E 08	3N 50E 36	4N 61E 20
11S 47E 24	1N 57E 05	2N 59E 09	3N 58E 24	4N 61E 28
11S 47E 25	1N 57E 06	2N 59E 10	3N 58E 25	4N 61E 29
11S 48E 07	1N 62E 01	2N 59E 16	3N 58E 26	4N 61E 30
11S 48E 08	1N 62E 12	2N 59E 17	3N 58E 33	4N 61E 32
11S 48E 09	1N 63E 06	2N 59E 18	3N 58E 34	4N 61E 33
11S 48E 10	1N 63E 07	2N 59E 19	3N 58E 35	4N 61E 34
11S 48E 11	1N 63E 08	2N 59E 20	3N 58E 36	4S 43E 01
11S 48E 14	1N 63E 17	2N 60E 01	3N 59E 12	4S 43E 02
11S 48E 15	1N 63E 18	2N 61E 06	3N 59E 13	4S 43E 03
11S 48E 16	1N 63E 19	2N 62E 01	3N 59E 14	4S 43E 10
11S 48E 17	1N 63E 20	2N 62E 02	3N 59E 19	4S 43E 11
11S 48E 18	1N 63E 21	2N 62E 03	3N 59E 20	4S 43E 12
11S 48E 19	1N 63E 26	2N 62E 04	3N 59E 21	4S 43E 14
11S 48E 20	1N 63E 27	2N 62E 05	3N 59E 22	4S 43E 15
11S 48E 21	1N 63E 28	2N 62E 10	3N 59E 23	4S 43E 22
11S 48E 22	1N 63E 29	2N 62E 11	3N 59E 24	4S 43E 23
11S 48E 27	1N 63E 30	2N 62E 12	3N 59E 25	4S 43E 26
11S 48E 28	1N 63E 32	2N 62E 13	3N 59E 26	4S 43E 27
11S 48E 29	1N 63E 33	2N 62E 14	3N 59E 27	4S 43E 28
11S 48E 30	1N 63E 34	2N 62E 15	3N 59E 28	4S 43E 33
11S 48E 31	1N 63E 35	2N 62E 24	3N 59E 29	4S 43E 34
11S 48E 32	1S 43E 01	2N 62E 25	3N 59E 30	4S 67E 01
11S 48E 33	1S 43E 02	2N 62E 36	3N 59E 33	4S 67E 02
11S 48E 34	1S 43E 03	2N 63E 07	3N 59E 34	4S 67E 04
12S 48E 02	1S 43E 04	2N 63E 18	3N 59E 35	4S 67E 05
12S 48E 03	1S 43E 09	2N 63E 19	3N 59E 36	4S 67E 06
12S 48E 04	1S 43E 10	2N 63E 30	3N 60E 05	4S 67E 07
12S 48E 05	1S 43E 11	2N 63E 31	3N 60E 06	4S 67E 08
12S 48E 06	1S 43E 12	2S 43E 03	3N 60E 07	4S 67E 09
12S 48E 09	1S 43E 13	2S 43E 04	3N 60E 08	4S 67E 12
12S 48E 10	1S 43E 14	2S 43E 09	3N 60E 18	4S 68E 06
12S 48E 11	1S 43E 15	2S 43E 10	3N 60E 19	4S 68E 07
12S 48E 13	1S 43E 16	2S 43E 15	3N 60E 20	4S 68E 08
12S 48E 14	1S 43E 21	2S 43E 16	3N 60E 21	4S 68E 17
12S 48E 15	1S 43E 22	2S 43E 20	3N 60E 22	4S 68E 18
12S 48E 23	1S 43E 23	2S 43E 21	3N 60E 25	5S 43E 03
12S 48E 24	1S 43E 24	2S 43E 22	3N 60E 26	5S 43E 04
12S 48E 25	1S 43E 25	2S 43E 27	3N 60E 27	5S 43E 05
12S 48E 26	1S 43E 27	2S 43E 28	3N 60E 28	5S 43E 08
12S 48E 35	1S 43E 28	2S 43E 29	3N 60E 29	5S 43E 09
12S 48E 36	1S 43E 33	2S 43E 32	3N 60E 30	5S 43E 15
12S 49E 31	1S 43E 34	2S 43E 33	3N 60E 31	5S 43E 16
13S 48E 09	1S 44E 18	2S 43E 34	3N 60E 34	5S 43E 17
13S 48E 10	1S 44E 19	2S 43E 35	3N 60E 35	5S 43E 21
13S 48E 14	1S 44E 29	2S 43E 36	3N 60E 36	5S 43E 22
13S 48E 15	1S 44E 30	2S 44E 04	3N 61E 02	5S 43E 27
13S 48E 16	1S 44E 31	2S 44E 05	3N 61E 03	5S 43E 28
13S 48E 22	1S 44E 32	2S 44E 06	3N 61E 04	5S 43E 33
13S 48E 23	1S 51.2E 06	2S 44E 08	3N 61E 09	5S 43E 34
13S 48E 24	1S 51.2E 07	2S 44E 09	3N 61E 10	5S 43E 35
13S 48E 25	1S 51.2E 08	2S 44E 16	3N 61E 11	6S 43E 01
13S 48E 26	1S 51.2E 17	2S 44E 17	3N 61E 12	6S 43E 02
13S 48E 36	1S 51.2E 18	2S 44E 20	3N 61E 13	6S 43E 03
13S 49E 13	1S 51.2E 19	2S 44E 21	3N 61E 14	6S 43E 10
13S 49E 14	1S 51.2E 20	2S 44E 22	3N 61E 22	6S 43E 11
13S 49E 19	1S 51.2E 28	2S 44E 27	3N 61E 23	6S 43E 12
13S 49E 22	1S 51.2E 29	2S 44E 28	3N 61E 24	6S 43E 13
13S 49E 23	1S 51.2E 30	2S 44E 32	3N 61E 25	6S 43E 14
13S 49E 24	1S 51.2E 31	2S 44E 33	3N 61E 26	6S 43E 15
13S 49E 25	1S 51.2E 32	2S 44E 34	3N 61E 27	6S 43E 23
13S 49E 26	1S 51.2E 33	2S 51.2E 04	3N 61E 28	6S 43E 24

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13S 49E 27	1S 51E 01	2S 51.2E 05	3N 61E 29	6S 43E 25
13S 49E 29	1S 51E 02	2S 51.2E 06	3N 61E 30	6S 43E 26
13S 49E 30	1S 51E 03	2S 51.2E 07	3N 61E 31	6S 43E 27
13S 49E 31	1S 51E 10	2S 51.2E 08	3N 61E 32	6S 43E 34
13S 49E 32	1S 51E 11	2S 51.2E 09	3N 61E 33	6S 43E 35
13S 49E 33	1S 51E 12	2S 51.2E 16	3N 61E 34	6S 43E 36
13S 49E 34	1S 51E 13	2S 51.2E 17	3N 61E 35	6S 44E 06
13S 49E 35	1S 51E 14	2S 51.2E 18	3N 61E 36	6S 44E 07
13S 49E 36	1S 51E 24	2S 51.2E 20	3N 62E 18	6S 44E 08
13S 50E 30	1S 51E 25	2S 51.2E 21	3N 62E 19	6S 44E 15
13S 50E 31	1S 51E 36	2S 51E 01	3N 62E 20	6S 44E 16
14S 49E 01	1S 52E 31	2S 51E 12	3N 62E 28	6S 44E 17
14S 49E 02	1S 53E 25	2S 52E 06	3N 62E 29	6S 44E 18
14S 49E 03	1S 53E 35	2S 52E 07	3N 62E 30	6S 44E 20
14S 49E 04	1S 53E 36	2S 52E 08	3N 62E 31	6S 44E 21
14S 49E 05	1S 54E 01	2S 52E 11	3N 62E 32	6S 44E 22
14S 49E 08	1S 54E 10	2S 52E 12	3N 62E 33	6S 44E 27
14S 49E 09	1S 54E 11	2S 52E 13	3N 62E 34	6S 44E 28
14S 49E 10	1S 54E 12	2S 52E 14	3N 62E 35	6S 44E 31
14S 49E 11	1S 54E 13	2S 52E 15	3S 43E 01	6S 44E 33
14S 49E 12	1S 54E 14	2S 52E 16	3S 43E 02	6S 44E 34
14S 49E 15	1S 54E 15	2S 52E 17	3S 43E 03	7S 43E 01
14S 49E 16	1S 54E 16	2S 52E 18	3S 43E 04	7S 43E 02
14S 50E 06	1S 54E 20	2S 52E 19	3S 43E 10	7S 43E 03
1N 43E 23	1S 54E 21	2S 52E 20	3S 43E 11	7S 43E 11
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1N 43E 26	1S 54E 28	2S 52E 23	3S 43E 14	7S 43E 14
1N 43E 27	1S 54E 29	2S 53E 01	3S 43E 15	7S 43E 24
1N 43E 34	1S 54E 30	2S 53E 02	3S 43E 22	7S 43E 25
1N 43E 35	1S 54E 31	2S 53E 03	3S 43E 23	7S 44E 03
1N 43E 36	1S 55E 05	2S 53E 07	3S 43E 24	7S 44E 04
1N 44E 19	1S 55E 06	2S 53E 08	3S 43E 25	7S 44E 05
1N 44E 20	1S 55E 07	2S 53E 09	3S 43E 26	7S 44E 06
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1N 44E 22	1S 63E 02	2S 53E 11	3S 43E 34	7S 44E 08
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1N 44E 25	1S 63E 13	2S 53E 17	3S 44E 04	7S 44E 14
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1N 44E 28	1S 64E 16	2S 65E 02	3S 44E 08	7S 44E 17
1N 44E 29	1S 64E 17	2S 65E 03	3S 44E 09	7S 44E 18
1N 44E 30	1S 64E 18	2S 65E 11	3S 44E 17	7S 44E 19
1N 45E 19	1S 64E 19	2S 65E 12	3S 44E 18	7S 44E 21
1N 45E 20	1S 64E 20	2S 65E 13	3S 44E 19	7S 44E 22
1N 45E 25	1S 64E 21	2S 65E 14	3S 44E 20	7S 44E 23
1N 45E 26	1S 64E 22	2S 66E 01	3S 44E 30	7S 44E 25
1N 45E 27	1S 64E 23	2S 66E 02	3S 44E 31	7S 44E 26
1N 45E 28	1S 64E 24	2S 66E 03	3S 67E 01	7S 44E 27
1N 45E 29	1S 64E 25	2S 66E 04	3S 67E 02	7S 44E 29
1N 45E 30	1S 64E 26	2S 66E 05	3S 67E 03	7S 44E 30
1N 45E 32	1S 64E 27	2S 66E 07	3S 67E 10	7S 44E 31
1N 45E 33	1S 65E 19	2S 66E 08	3S 67E 11	7S 44E 32
1N 45E 34	1S 65E 20	2S 66E 09	3S 67E 12	7S 44E 33
1N 45E 35	1S 65E 27	2S 66E 10	3S 67E 13	7S 44E 35
1N 45E 36	1S 65E 28	2S 66E 11	3S 67E 14	7S 44E 36
1N 46E 25	1S 65E 29	2S 66E 12	3S 67E 15	8S 44E 01
1N 46E 26	1S 65E 30	2S 66E 13	3S 67E 16	8S 44E 02
1N 46E 27	1S 65E 32	2S 66E 14	3S 67E 21	8S 44E 03
1N 46E 28	1S 65E 33	2S 66E 16	3S 67E 22	8S 44E 04
1N 46E 29	1S 65E 34	2S 66E 17	3S 67E 23	8S 44E 05
1N 46E 30	1S 65E 35	2S 66E 18	3S 67E 24	8S 44E 09
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1N 46E 33	2N 47E 36	2S 67E 07	3S 67E 28	8S 44E 12
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1N 46E 36	2N 48E 04	2S 67E 14	3S 67E 33	8S 44E 15
1N 47E 01	2N 48E 08	2S 67E 15	3S 67E 35	8S 44E 16
1N 47E 02	2N 48E 09	2S 67E 16	3S 67E 36	8S 44E 22
1N 47E 03	2N 48E 10	2S 67E 17	3S 68E 01	8S 44E 23
1N 47E 10	2N 48E 16	2S 67E 18	3S 68E 12	8S 44E 24
1N 47E 11	2N 48E 17	2S 67E 19	3S 68E 19	8S 44E 25
1N 47E 12	2N 48E 18	2S 67E 20	3S 68E 30	8S 44E 26
1N 47E 14	2N 48E 19	2S 67E 21	3S 68E 31	8S 44E 36

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1N 47E 15	2N 48E 20	2S 67E 22	3S 69E 03	8S 45E 06
1N 47E 16	2N 48E 21	2S 67E 23	3S 69E 04	8S 45E 07
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1N 47E 22	2N 48E 31	2S 67E 26	3S 69E 07	8S 45E 20
1N 47E 28	2N 50E 01	2S 67E 29	3S 69E 08	8S 45E 28
1N 47E 29	2N 50E 02	2S 67E 30	3S 69E 09	8S 45E 29
1N 47E 30	2N 50E 11	2S 67E 35	3S 69E 10	8S 45E 30
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1N 50E 01	2N 50E 14	2S 68E 23	3S 69E 14	8S 45E 33
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1N 51E 06	2N 50E 36	2S 68E 27	3S 69E 23	9S 45E 04
1N 51E 07	2N 51E 18	2S 68E 28	3S 69E 24	9S 45E 05
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1N 51E 19	2N 57E 13	2S 68E 33	3S 70E 11	9S 45E 12
1N 51E 20	2N 57E 14	2S 68E 34	3S 70E 12	9S 45E 13
1N 51E 21	2N 57E 22	2S 68E 35	3S 70E 13	9S 45E 14
1N 51E 22	2N 57E 23	2S 68E 36	3S 70E 14	9S 45E 24
1N 51E 26	2N 57E 24	2S 69E 30	3S 70E 15	9S 46E 07
1N 51E 27	2N 57E 25	2S 69E 31	3S 70E 16	9S 46E 17
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1N 55E 21	2N 57E 35	3N 48E 26	4N 49.2E 26	9S 46E 29
1N 55E 22	2N 57E 36	3N 48E 27	4N 49.2E 27	9S 46E 33
1N 55E 23	2N 58E 02	3N 48E 34	4N 49.2E 34	9S 46E 34
				9S 46E 35
				9S 46E 36

The area described contains 308,600 acres in Clark, Esmeralda, Lincoln, and Nye Counties.

This withdrawal approximates the land encompassed by the Caliente rail corridor as described in the Department of Energy's Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, February 2002. The purpose of the withdrawal is to evaluate the land for the potential construction and operation of a branch rail line for the transportation of spent nuclear fuel and high-level radioactive waste in the event the Nuclear Regulatory Commission authorizes a geologic repository at Yucca Mountain as provided for under the Nuclear Waste Policy Act of 1982, as amended.

For a period of 90 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the Nevada State Director of the Bureau of Land Management.

Notice is hereby given that there will be at least one public meeting in connection with the proposed withdrawal to be announced at a later date. A notice of the time, place, and date will be published in the **Federal Register** and a local newspaper at least 30 days before the scheduled date of a meeting.

Comments, including names and street addresses of commenters, will be available for public review at the Nevada State Office, 1340 Financial Boulevard, Reno, Nevada, during regular business hours 7:30 a.m. to 4:30 p.m., Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to hold your name or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comments. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses will be made available for public inspection in their entirety.

The application will be processed in accordance with the regulations set forth in 43 CFR Part 2300.

For a period of 2 years from December 29, 2003, in accordance with 43 CFR 2310.2(a), the lands described in this notice will be segregated from surface entry and mining, unless the application is denied or canceled, or the withdrawal is approved prior to that date. Other uses which may be permitted during this segregative period are rights-of-way, leases, and permits as long as they do not conflict with the proposed withdrawal.

Dated: December 19, 2003.

Margaret L. Jensen,

Deputy State Director, Natural Resources, Lands, and Planning.

[FR Doc. 03–31901 Filed 12–24–03; 8:45 am]

BILLING CODE 4310–HC–P

A.3 69 FR 18557, April 8, 2004

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DEPARTMENT OF ENERGY

Record of Decision on Mode of Transportation and Nevada Rail Corridor for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV

AGENCY: Office of Civilian Radioactive Waste Management, U.S. Department of Energy.

ACTION: Record of decision.

SUMMARY: On July 23, 2002, the President signed into law (Pub. L. 107–200) a joint resolution of the U.S. House of Representatives and the U.S. Senate designating the Yucca Mountain site in Nye County, Nevada, for development as a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste. In the event the Nuclear Regulatory Commission (NRC) authorizes construction of the repository and receipt and possession of spent nuclear fuel and high-level radioactive waste at Yucca Mountain, the Department of Energy (Department or DOE) would be responsible for transporting these materials to the Yucca Mountain Repository as part of its obligations under the Nuclear Waste Policy Act (NWPA). Pursuant to the NWPA and the National Environmental Policy Act (NEPA), DOE issued the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS–0250F, February 2002) (Final EIS). That document analyzed the environmental impacts of the proposed action of constructing, operating and monitoring, and eventually closing a geologic repository for the disposal of 70,000 metric tons of heavy metal (MTHM) of spent nuclear fuel and high-level radioactive waste at Yucca Mountain, as well as of transporting spent nuclear fuel and high-level radioactive waste from commercial and DOE sites to the Yucca Mountain site.

In preparing the Final EIS, DOE initiated public scoping in 1995, and subsequently issued for public comment a Draft EIS in 1999 and a Supplement to the Draft EIS in 2000. During the 199-day public comment period on the Draft EIS, DOE held public hearings in 21

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locations across the country, 10 of which were held throughout the State of Nevada. An additional hearing was convened in Las Vegas for members of Native American Tribes in the region. During the 56-day public comment period on the Supplement to the Draft EIS, DOE held three public hearings in Nevada. The Department received more than 13,000 comments on the Draft EIS and the Supplement to the Draft EIS; about 3,600 of these comments addressed transportation related matters.

DOE is now in the process of preparing an application to the Nuclear Regulatory Commission (NRC) seeking authorization to construct the repository. In addition, in order to be in a position to transport waste to the repository should the NRC approve construction and waste receipt, DOE must proceed with certain decisions relating to the transportation of this material. In particular, the Department has decided to select the mostly rail scenario analyzed in the Final EIS as the transportation mode both on a national basis and in the State of Nevada. Under the mostly rail scenario, the Department would rely on a combination of rail, truck and possibly barge to transport to the repository site at Yucca Mountain up to 70,000 MTHM of spent nuclear fuel and high-level radioactive waste, with most of the spent nuclear fuel and high-level radioactive waste being transported by rail. This will ultimately require construction of a rail line in Nevada to the repository. In addition, the Department has decided to select the Caliente rail corridor [1] in which to examine potential alignments within which to construct that rail line. Should the Department select an alignment within that corridor, it will obtain all necessary regulatory approvals before beginning construction.

ADDRESSES: Copies of the Final EIS and this Record of Decision may be obtained by calling or mailing a request to: Ms. Robin Sweeney, Office of National Transportation, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 011, Las Vegas, NV 89134. Telephone 1–800–967–3477. The Final EIS, including the Readers Guide and Summary, is available via the Internet at *http://www.ocrwm.doe.gov/ documents/feis_a/index.htm*. This Record of Decision is available at *http://www.ocrwm.doe.gov* under "What's New". Questions regarding the Final EIS or this Record of Decision can be submitted by calling or mailing them to Ms. Robin Sweeney at the above phone number or address.

FOR FURTHER INFORMATION CONTACT: For general information regarding the DOE National Environmental Policy Act (NEPA) process contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (EH–42), U.S. Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585. Telephone 202–586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Transportation-Related Decisions

The analyses in the Final EIS provide the bases for the following three decisions under NEPA related to the establishment of a transportation program under which the Department would transport spent nuclear fuel and high-level radioactive waste to a repository at Yucca Mountain:

1. Outside Nevada, the selection of a national mode of transportation scenario (mostly rail or mostly legal-weight truck).

2. In Nevada, the selection among transportation mode scenarios (mostly rail, mostly legal-weight truck, or mostly heavy-haul truck with an associated intermodal transfer station), and

3. In Nevada, if the mostly rail scenario or mostly heavy-haul truck scenario were selected, the selection among rail corridor implementing alternatives, or heavy-haul truck route implementing alternatives with use of an associated intermodal transfer station.

See Figure 2–5 on page 2–7 of the Final EIS for a graphical depiction of the different transportation scenarios and implementing alternatives.

Part I. Record of Decision for Mode of Transportation

Proposed Action and Transportation Mode Scenarios Considered in the Final EIS

The Final EIS examines a Proposed Action under which DOE would ship spent nuclear fuel and high-level radioactive waste from 72 commercial and 5 DOE sites [2] to the Yucca Mountain Repository. The Final EIS considers the potential environmental impacts of transporting spent nuclear fuel and high-level radioactive waste to the repository under a variety of modes, including legal-weight truck, rail, heavy-haul truck, and possibly barge. The Final EIS also considers the environmental impacts of two No-Action Alternatives, one under which spent nuclear fuel and high-level radioactive waste would remain at the 72 commercial and five DOE sites under institutional control for at least 10,000 years, and one under which these materials would remain at the 77 sites in perpetuity, but under institutional control for only 100 years.

At the outset, we note that over the past 30 years, more than 2,700 shipments of spent nuclear fuel have been completed, none of which has resulted in an identified injury caused by the release of radioactive material. That basic fact provides important context for our decisionmaking today.

The Final EIS examines various national transportation scenarios and Nevada transportation implementing alternatives to reflect the range of potential environmental impacts that could occur. Two national transportation scenarios, referred to as the "mostly legal-weight truck" scenario and the "mostly rail" scenario, and three Nevada scenarios, referred to as the legal-weight truck scenario, the rail scenario, and the heavy-haul truck scenario, were evaluated. The three broad scenarios discussed below represent the combinations of the scenarios and implementing alternatives as analyzed in the Final EIS.

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[1] A corridor is a strip of land, approximately 0.25 miles (400 meters) wide, that encompasses one of several possible routes through which DOE could build a rail line. An alignment is the specific location of a rail line in a corridor.

[2] Fifty-four additional sites (primarily domestic research reactors) were expected to ship spent nuclear fuel to two DOE sites prior to disposal at the repository. DOE plans to consolidate these materials at the two DOE sites are independent of the decisions relating to a repository at Yucca Mountain. Shipments from these sites to DOE sites were analyzed in the "Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Environmental Impact Statement" (PEIS) (DOE/EIS–0202–F; April 1995), and associated Records of Decision (June 1, 1995; 60 FR 28680 and March 8, 1996; 61 FR 9441). The direct impacts of this consolidation are not included in the analysis of the alternatives analyzed in the Final EIS for the repository, because they would occur whether or not DOE proceeds with the repository at Yucca Mountain. Since the PEIS was published, three research reactors have closed. As provided for in the Record of Decision (ROD) for the PEIS, spent nuclear fuel from one reactor was sent to the Savannah River Site and fuel from another reactor was sent to the Idaho National Engineering and Environmental Laboratory (INEEL). Fuel from the third reactor, which the ROD for the PEIS anticipated would be consolidated at INEEL, was sent on an interim basis to the United States Geological Survey (USGS) site in Lakewood, Colorado (which also was one of the fifty-four sites analyzed in the PEIS). It is still ultimately expected to be consolidated at INEEL as provided in the ROD for the PEIS, whence it will be shipped to the repository. The fuel that went to USGS is within the amounts analyzed by the PEIS as going from USGS to INEEL. Moreover, since the change in interim storage plans does not affect the shipment of fuel to Yucca Mountain, it does not affect the transportation analysis in the Final EIS for the repository.

Mostly Rail to the Yucca Mountain Repository—Preferred Mode of Transportation

Under the preferred mode of transportation as analyzed in the Final EIS (the mostly rail scenario), DOE would ship most of the spent nuclear fuel and high-level radioactive waste from the 77 sites to the Yucca Mountain Repository by rail. DOE would construct a rail line in one of five rail corridors considered in the Final EIS to connect the repository at Yucca Mountain to an existing main rail line in Nevada.

Under the mostly rail scenario analyzed in the Final EIS, radioactive materials from certain commercial nuclear sites that do not have the capability to load rail-shipping casks would be shipped by legal-weight truck to the repository. For other commercial sites that have the capability to load rail shipping casks, but do not have rail access, materials would be shipped either by heavy-haul truck or possibly barge to a nearby railhead outside Nevada for shipment by rail to the repository at Yucca Mountain.

Under the mostly rail alternative, about 9,000 to 10,000 train shipments (assuming one cask per train [3]) of spent nuclear fuel and high-level radioactive waste would travel on the nation's rail network over the anticipated 24-year period (DOE's current plan calls for three casks per train shipment, about 3,000 to 3,300 total shipments). In addition, there would be about 1,000 legal-weight truck shipments from commercial sites that do not have the capability to load rail-shipping casks to the repository at Yucca Mountain.

Mostly Rail to Nevada With Transfer to Heavy-Haul Truck for Shipment to the Repository

Under this scenario as analyzed in the Final EIS, DOE would ship most spent nuclear fuel and high-level radioactive waste from the 77 sites to Nevada by rail. Rail shipments would terminate in Nevada at an intermodal transfer station where shipping casks would be transferred from rail cars to heavy-haul trucks for shipment to the Yucca Mountain Repository. DOE would construct an intermodal transfer station at one of three locations analyzed in the Final EIS. One of the five heavy-haul routes analyzed in the Final EIS would be upgraded to improve transportation operations, reduce traffic congestion, and enable year-round shipments to the repository.

Under this scenario, radioactive materials from certain commercial nuclear sites that do not have the capability to load rail-shipping casks would be shipped by legal-weight truck directly to the repository.

Under this alternative, about 9,000 to 10,000 train shipments (assuming one cask per train) of spent nuclear fuel and high-level radioactive waste would travel on the nation's rail network to Nevada over the 24-year period. There also would be about 9,000 to 10,000 heavy-haul truck shipments in Nevada from the intermodal transfer station to the repository. In addition, there would be about 1,000 legal-weight truck shipments from commercial sites that do not have the capability to load rail-shipping casks to the repository at Yucca Mountain.

Mostly Legal-Weight Truck to the Yucca Mountain Repository

Under the mostly legal-weight truck scenario, as analyzed in the Final EIS, DOE would ship most spent nuclear fuel and high-level radioactive waste from the 77 sites to the repository by legal-weight truck. About 53,000 legal-weight trucks carrying these materials would travel primarily on the nation's interstate highway system during the 24-year period. About 300 shipments of naval spent nuclear fuel would travel from the Idaho National Engineering and Environmental Laboratory to Nevada by rail, where the rail casks would be transferred to heavy-haul trucks for shipment to the repository.

Environmentally Preferable Transportation Mode Alternative

In making this determination, DOE considered human health and environmental impacts that could occur from shipping spent nuclear fuel and high-level radioactive waste from the 77 sites to the repository at Yucca Mountain. DOE also considered the human health and environmental impacts that could occur from the construction of a rail line and from any upgrades to existing highways (the heavy-haul truck routes) in Nevada.

The Final EIS indicates that some potential non-radiological fatalities could occur as a result of traffic accidents during the transportation of spent nuclear fuel and high-level radioactive waste to the repository at Yucca Mountain. The Final EIS indicates that the highest number of potential traffic fatalities (about five) could occur under the mostly legal-weight truck scenario, whereas the mostly rail scenario could result in about three potential traffic fatalities during the 24-year period of shipping spent nuclear fuel and high-level radioactive waste to the repository at Yucca Mountain.

The Final EIS also considers the potential health effects that could result from radiation exposure to workers during shipping and from cask loading and unloading, and to the general population along the transportation routes to the repository. Under the mostly legal-weight truck scenario, the Final EIS indicates that about 12 worker and three general public latent cancer fatalities could occur from routine (incident-free) exposures during the 24-year period of shipping spent nuclear fuel and high-level radioactive waste to the repository. Under the mostly rail scenario, about three worker and one general public latent cancer fatalities could occur during the 24-year period. The radiation dose to any one individual would be extremely small.

DOE also estimated the potential health effects to the general public that could result from a severe transportation accident during shipments to the repository (referred to in the Final EIS as a maximum reasonably foreseeable accident). The probability that this accident could occur is extremely unlikely—about three chances in 10 million per year. If such an accident were to occur in an urban population setting, less than one latent cancer fatality could be expected under the mostly legal-weight truck scenario, whereas about five latent cancer fatalities could be expected under the mostly rail scenario, primarily because of the greater amounts of radioactive materials that could be released from a rail cask in such an accident.

In Nevada, construction of a rail line, regardless of the rail corridor selected, would involve the disturbance of land (and associated impacts, although low, to natural resources such as biological and cultural resources) in amounts greater than those associated with any heavy-haul truck alternative. For example, construction of a rail line in the shortest rail corridor (Valley Modified) would result in the disturbance of about 1,240 acres; rail line construction in the longest corridor (Carlin) would disturb about 4,900 acres. Construction of an intermodal transfer station and the upgrade of the longest heavy-haul route would result in the disturbance of about 1,000 acres. Furthermore, the construction of any rail line would involve various land use conflicts that, for the most part, would not occur with the limited construction required to improve any of the heavy-haul truck routes. No land disturbances

[3] The final EIS stated that DOE anticipated as many as 5 casks per train. However, DOE conservatively estimated 1 cask per train for analytical purposes to ensure that it considered routine and accident transportation risks that could result from a larger number of train shipments (9,000 to 10,000).

would occur under the legal-weight truck alternative.

The Department also evaluated the risk of sabotage, including terrorism. For reasons the NRC has carefully explained, this analysis is most likely not required by NEPA.[4] It is not possible to predict whether such acts would occur and, if they did, the nature of such acts. Moreover, such analysis does not advance the public participation purpose of NEPA, since there are serious limits on what information can responsibly be disseminated on these issues without risking disclosure of information that might be used in planning or carrying out such an act.[5] Nevertheless, the Final EIS includes the consequences of a potentially successful attempt on a cask during shipment via rail or legal-weight truck. In both instances, a successful attack would result in the release of contaminants into the environment. The consequences estimated for a rail shipment would be less than those estimated for a legal-weight truck shipment, mostly because the thicker shield wall of the heavier rail cask would tend to mitigate the effects of the sabotage event when compared to the lighter, legal-weight truck transportation cask.

None of the three transportation scenarios analyzed in the Final EIS is clearly environmentally preferable. Each would result in some impact to the environment, and public health and safety, although all impacts would be small. For example, transporting by either rail or heavy-haul truck in Nevada would result in some land disturbance, although the impacts would be greater for rail because more land would be disturbed during the construction of a rail line than during the upgrading of existing highways to accommodate heavy-haul trucks. Radiation exposure to workers and the public from either routine rail or truck shipments to the repository at Yucca Mountain would be very small, and the differences among the different modes of transportation also would be very small. Similarly, accident risks under each alternative would be very small, and associated differences among alternatives also very small. The Department does not consider the differences among modes to be sufficiently distinct to make any of them clearly environmentally preferable.

Although the potential impacts of any of the transportation alternatives would be small, they would be greater than the transportation-related impacts of the No-Action Alternatives. Overall however, as analyzed in the Final EIS, the impacts of proceeding with construction and operation of a repository at Yucca Mountain, including transportation, would cause relatively small public health impacts through the period 10,000 years after repository closure and would cause fewer public health impacts than the No-Action Alternative. For the No-Action Alternative with institutional controls for 10,000 years, the potential long-term environmental impacts also would be small, but significantly greater than the proposed action because the potential for nonradiological fatalities to workers under this alternative is significantly greater. Additional information may be found on pages S–82 through S–88 and Chapters 2 and 7 of the Final EIS. The cost of this No-Action Alternative is also significantly greater than that of the proposed action ($42.7 billion to $57.3 billion (in 2001 dollars) for the proposed action versus $167 billion to $184 billion for the first 300 years of institutional control and $519 million to $572 million per year thereafter). Additionally, the public health and safety impacts of the No-Action Alternative without effective institutional control are significantly greater than the proposed action. Likewise, in the long run, securing these materials by consolidating them and disposing of them in a secure, remote location, better protects against terrorist attack than leaving them at 72 commercial and 5 DOE sites in 35 states within 75 miles of more than 161 million Americans.[6] Moreover, for the reasons expressed by the Secretary and the President in their site recommendations and by the Congress in passing the joint resolution, it is in the national interest to move forward with this project.

In any event, in the Yucca Mountain Development Act, Pub. L. 107–200, Congress directed DOE to proceed with the development of a license application for a repository for the disposal of spent nuclear fuel and high-level radioactive waste. DOE believes that this statute and the NWPA make it incumbent on DOE to proceed with appropriate transportation planning so the Department will be in a position to fulfill its responsibility under the NWPA to begin disposal of this material promptly, should the NRC grant the necessary authorizations for it to do so.

Transportation-Related Comments on the Final EIS

DOE distributed about 6,200 copies of the Final EIS and has received written comments on the Final EIS from the White Pine County Nuclear Waste Project Office, White Pine County Board of County Commissioners, Board of County Commissioners Lincoln County, Board of Mineral County Commissioners, and a member of the public. Although comments were received on a variety of issues, the following summation addresses only those few comments related to the transportation of spent nuclear fuel and high-level radioactive waste to a Yucca Mountain repository.

Commenters stated that DOE should develop specific transportation-related mitigation measures, and encouraged DOE to do so in a cooperative manner. Commenters also stated that additional, more detailed and community-specific transportation analyses are needed for purposes of mitigation planning, as well as to support DOE in its transportation decisionmaking, such as the decision on the mode of transportation. Commenters also encouraged DOE to develop plans for transportation, such as route selection for shipments of spent nuclear fuel and high-level radioactive waste, and emergency planning and response. Commenters also requested clarification of the roles of the NRC and DOE's transportation services contractors, and whether counties are eligible for technical assistance and funding under Section 180(c) of the Nuclear Waste Policy Act (NWPA).

As discussed below in Use of All Practicable Means to Avoid or Minimize Harm (Parts I and II), DOE has already adopted measures to avoid or minimize environmental harm that could result from the transportation of spent nuclear fuel and high-level radioactive waste. Additional potential mitigation measures associated with the construction of a rail line will be identified during preparation of an environmental impact statement that considers alternative alignments within the Caliente corridor for construction of the rail line (see PART II of this ROD). DOE also will consult with states, Native American tribes, local governments, utilities, the transportation industry and other interested parties in a cooperative

[4] *See Duke Cogema Stone & Webster*, 56 N.R.C. 335 (2002); *Private Fuel Storage, L.L.C.*, 56 N.R.C. 340 (2002); *Duke Energy Corp.*, 56 N.R.C. 358 (2002); *Dominion Nuclear Connecticut, Inc.*, 56 N.R.C. 367 (2002); *Pacific Gas & Electric Company*, 57 N.R.C. 1 (2003); and *Pacific Gas & Electric Company*, 58 N.R.C. 185 (2003), appeal docketed, No. 03–74628 (9th Cir. Dec. 12, 2003).

[5] *See* materials cited in footnote 4

[6] As explained in footnote 2, some additional materials are currently stored at 50 additional sites (54 at the time of site recommendation), consisting primarily of research reactors, in four additional states, but DOE plans to consolidate these materials at two DOE sites for reasons unrelated to its repository plans.

manner to refine the transportation system as it is developed. Furthermore, DOE must comply with the transportation-related provisions of the NWPA. Spent nuclear fuel and high-level radioactive waste will be shipped to Yucca Mountain in casks that have been certified by the NRC (Section 180(a)). Prior to these shipments, DOE will comply with the regulations of the NRC regarding advanced notification of state and local governments (Section 180(b)).

Transportation Mode Decision

Under the NWPA, the Department is responsible for planning that will allow for the transportation of spent nuclear fuel and high-level radioactive waste in the event the NRC authorizes receipt and possession of these materials at Yucca Mountain. Accordingly, as the next step in fulfilling that responsibility, the Department is issuing this Record of Decision to select a transportation mode. The Department has decided to select the preferred mode of transportation analyzed in the Final EIS, the mostly rail scenario, both on a national basis and in the State of Nevada. Under this decision, the Department would rely on a combination of rail, truck and possibly barge to transport to the repository up to 70,000 MTHM of spent nuclear fuel and high-level radioactive waste. Most of the spent nuclear fuel and high-level radioactive waste would be transported by rail. The Department would use truck transport where necessary, depending on certain factors such as the timing of the completion of the rail line proposed to be constructed in Nevada. This could include building an intermodal capability at a rail line in Nevada to take legal-weight truck casks from rail cars and transport them the rest of the way to the repository via highway, should the rail system be unavailable at the time of the opening of the repository [7]. In addition, since some commercial utilities are not able to accommodate rail casks, they would ship by legal-weight truck to the repository. Additionally, the Department would use heavy-haul truck and possibly barge as needed to ship spent nuclear fuel from commercial nuclear sites to nearby railheads outside Nevada for shipment to the repository.

Basis for Transportation Mode Decision

As we explain below, the Department has concluded that it should use mostly rail nationwide and in Nevada based, in large part, on the analyses of the Final EIS. The Department also considered the preferences for rail transportation expressed by the State of Nevada and other factors described below.

The analyses in the Final EIS demonstrate that the potential radiation doses to workers and the general public from rail, truck or barge transportation would be very small, and that the differences in resulting potential impacts from such exposures among the different modes of transportation also would be very small. Nevertheless, using mostly rail tends to minimize the potential environmental impacts that could occur. The decision to rely primarily on the nation's rail system to ship these materials would result in fewer shipments than would occur if legal-weight trucks were the primary mode of transportation. This in turn would result in fewer trucks on public highways. The lower number of rail shipments as compared to truck shipments is estimated to result in fewer potential traffic fatalities and, under routine conditions, slightly fewer latent cancer fatalities to workers and the general public relative to mostly legal-weight truck shipments.

In reaching its decision, DOE also considered the number of commercial nuclear sites having, or expected to have, the capability to handle rail casks, the distances to suitable railheads near the commercial nuclear sites, and historical experience using rail to ship spent nuclear fuel and other large reactor-related components. The Department found that the preponderance of commercial sites have the capability and experience to ship to nearby railheads.

The Department also considered preferences expressed by the State of Nevada in its comments on the Draft EIS. In these comments, the state indicated that DOE should plan its transportation system to maximize the use of rail.

The Department also considered irreversible and irretrievable commitments of resources and cumulative impacts in making its decision. There would be an irreversible and irretrievable commitment of resources, such as land, electric power, fossil fuels and construction materials, associated with the construction of a rail line in Nevada, although this commitment of resources would not significantly diminish these resources, either nationwide or in Nevada. DOE also recognizes that for all alternatives involving transportation of spent nuclear fuel and high-level radioactive waste, there could be cumulative impacts from past, present and reasonably foreseeable future activities involving transportation of other radioactive materials. Based on the analyses in the Final EIS, DOE does not expect that any cumulative impacts would be significant over the duration of shipping spent nuclear fuel and high-level radioactive waste to the repository.

Based on these various considerations, DOE concludes that shipping by mostly rail, both nationally and in the State of Nevada, would be preferable to shipping by mostly truck or using heavy-haul trucks in Nevada.

Use of All Practicable Means To Avoid or Minimize Harm—Transportation Mode

The shipment of spent nuclear fuel and radioactive waste is highly regulated and subject to the utmost scrutiny. DOE carefully follows the Department of Transportation (DOT) and NRC transportation rules now and will follow or exceed any others that may be established in the future whether by the Congress or by DOT or NRC. DOE also will consult with states, Native American tribes, local governments, utilities, the transportation industry and other interested parties in a cooperative manner to refine the transportation system as it is developed.

Measures DOE will implement to avoid or minimize harm include the following [8]: prior to the shipment of spent nuclear fuel, the shipper or carrier must select routes and prepare a written plan listing origin and destination of the shipment, scheduled route, all planned stops, estimated time of departure and arrival, and emergency telephone numbers; advance notice must be provided to State and local governments prior to shipping irradiated reactor fuel through their states; anyone involved in the preparation or transport of radioactive materials will be required to have proper training; carriers must be provided with shipping papers containing emergency information, including contacts and telephone numbers, readily available during transport for inspection by appropriate officials; clearly identifiable markings, labels, and placards of hazardous contents must be provided; and all spent nuclear fuel and high-level

[7] In March 2004, DOE issued a Supplement Analysis and determined, in accordance with 10 CFR 1021.314, that this rail/legal-weight truck scenario would not constitute a substantial change to the proposal previously analyzed in the Final EIS or significant new circumstances or information relevant to environmental concerns, as discussed in 40 CFR 1502.9(c)(1).

[8] Application of these measures to national security activities may, in some respects, be subject to section 7 of the Nuclear Waste Policy Act, 42 U.S.C. section 10106.

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radioactive waste shipments would be in the most rugged casks (Type B, which range from small containers of sealed radioactive sources to heavily shielded steel casks that sometimes weigh as much as 150 tons).

The NRC has promulgated rules (10 CFR 73.37) and interim compensatory measures (March 4, 2002; 67 FR 9792) specifically aimed at protecting the public from harm that could result from sabotage of spent nuclear fuel casks. These security rules are designed to minimize the possibility of sabotage and facilitate recovery of spent nuclear fuel shipments that could come under the control of unauthorized persons. The use of armed escorts for all shipments; safeguarding the detailed shipping schedule information, monitoring of shipments through satellite tracking and a communication center with 24-hour staffing; and coordinating logistics with state and local law enforcement agencies all contribute to shipment security. Additionally, the cask safety features that provide containment, shielding, and thermal protection provide protection against sabotage. The Department and other agencies continue to examine the protections built into their physical security and safeguards systems for transportation shipments.

DOE is now developing its transportation security plan and its design basis threat for transportation. The transportation security plan will be developed in cooperation with other Federal agencies, including the NRC, DOT, and the Department of Homeland Security. The Office of Civilian Radioactive Waste Management is exploring the use of armed Federal agents as escorts for all shipments and other operational techniques employed by the National Nuclear Security Administration's Office of Secure Transportation as well as the design of special security cars for rail transport, to further mitigate the potential threat of a terrorist act. In addition to its domestic efforts, the Department is a member of the International Working Group on Sabotage for Transport and Storage Casks, which is investigating the consequences of a potential act of sabotage and is exploring opportunities to enhance the physical protection of casks. As a result of the above efforts, DOE will modify its methods and systems as appropriate between now and the time shipments start.

In compliance with section 180(c) of the NWPA, DOE will provide technical assistance and funds to states for training public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions the Department plans to ship spent nuclear fuel and high-level radioactive waste. The training of public safety officials will cover procedures required for safe routine transportation of these materials and for dealing with emergency response situations.

Pursuant to the NWPA, spent nuclear fuel and high-level radioactive waste will be transported in casks certified by the NRC. The NRC regulates and certifies the design, manufacture, testing and use of these casks. Additionally, the NWPA requires that DOE comply with NRC regulations regarding advance notification of State and local governments prior to transportation of spent nuclear fuel or high-level radioactive waste.

At this stage in the decision-making, the Department believes it has incorporated all practicable mitigation measures. The Department will continue to identify and evaluate potential mitigation measures as the transportation system develops and as a result of the lessons learned from the shipping of spent nuclear fuel and high-level radioactive waste.

Part II. Record of Decision for Nevada Rail Corridor

Background

As noted above, the mostly rail scenario assumes that DOE will ultimately construct a rail line in Nevada to ship spent nuclear fuel and high-level radioactive waste to the repository. To implement that scenario, DOE therefore needs to select among alternative rail corridors within which to study possible alignments in which it will pursue construction of a rail line that would connect the repository at Yucca Mountain to an existing main rail line in Nevada in the event the NRC authorizes construction of a repository at Yucca Mountain. In the Final EIS, DOE analyzed five potential rail corridors—Caliente, Carlin, Caliente-Chalk Mountain, Jean and Valley Modified—for this potential rail line. Additional descriptive information, including variations associated with each corridor, may be found in section 2.1.3.3 and Appendix J, section J.3.1.2, of the Final EIS. The Final EIS did not specify a corridor preference, but in December 2003, DOE announced its preference for the Caliente corridor (*Notice of Preferred Nevada Rail Corridor*; 68 FR 74951; December 29, 2003.

Proposed Action and Nevada Rail Corridors Considered in the Final EIS

A. Caliente Rail Corridor—Preferred Alternative

The Caliente corridor originates at an existing siding to the mainline railroad near Caliente, Nevada. The corridor extends in a westerly direction to the northwest corner of the Nevada Test and Training Range (previously known as Nellis Air Force Range), before turning south-southeast to the repository at Yucca Mountain. The corridor ranges between 318 miles (512 kilometers) and 344 miles (553 kilometers), depending on the variations to the corridor considered in the Final EIS. Construction of a rail line within the Caliente corridor would take about 46 months. The total life-cycle cost for construction and operation of the rail line is estimated to be $880 million (2001 dollars).

B. Carlin Rail Corridor

The Carlin corridor originates at the mainline railroad near Beowawe in north central Nevada. The Carlin and Caliente corridors converge near the northwest boundary of the Nevada Test and Training Range. Past this point, they are identical. The Carlin corridor ranges between 319 miles (513 kilometers) and 338 miles (544 kilometers) long, depending on the variations to the corridor. Construction of a rail line within the Carlin corridor would take about 46 months. The total life-cycle cost for construction and operation of the rail line is estimated to be $821 million (2001 dollars).

C. Caliente-Chalk Mountain Rail Corridor

The Caliente-Chalk Mountain corridor is identical to the Caliente corridor until it approaches the northern boundary of the Nevada Test and Training Range. At that point the Caliente-Chalk Mountain corridor turns south through the Nevada Test and Training Range and the Nevada Test Site to the Yucca Mountain site. Depending on the variations, the corridor is between 214 miles (344 kilometers) and 242 miles (382 kilometers) long from the tie-in at the mainline near Caliente to the Yucca Mountain site. Construction of a rail line within the Caliente-Chalk Mountain corridor would take about 43 months. The total life-cycle cost for construction and operation of the rail line is estimated to be $622 million (2001 dollars). The Department designated the Caliente-Chalk Mountain alternative as non-preferred in the Final EIS due to national security concerns raised by the U.S. Air Force.

D. Jean Rail Corridor

The Jean corridor originates at the existing mainline railroad near Jean, Nevada. The corridor ranges between 112 miles (181 kilometers) and 127 miles (204 kilometers) long from the tie-in with the mainline to the Yucca Mountain site. Construction of a rail line within the Jean corridor would take about 43 months. The total life-cycle cost for construction and operation of the rail line is estimated to be $462 million (2001 dollars).

E. Valley Modified Rail Corridor

The Valley Modified corridor originates at an existing rail siding off the mainline railroad northeast of Las Vegas. Depending on the variations, the corridor is between 98 miles (157 kilometers) and 101 miles (163 kilometers) long from the tie-in with the mainline to the Yucca Mountain site. Construction of a rail line within the Valley Modified corridor would take about 40 months. The total life-cycle cost for construction and operation of the rail line is estimated to be $283 million (2001 dollars).

Environmentally Preferable Rail Corridor Alternative

DOE considered human health and environmental impacts that could occur from the construction of a rail line, as well as from shipping spent nuclear fuel and high-level radioactive waste in Nevada.

Construction of a rail line, regardless of the rail corridor selected, would involve the disturbance of land and associated impacts, although low, to natural resources such as biological and cultural resources. For example, construction of a rail line in the Valley Modified corridor (shortest) would result in the disturbance of about 1,240 acres; rail line construction in the Carlin corridor (longest) would disturb about 4,900 acres.

Construction of any rail line in Nevada also would conflict with existing land uses. Depending on the variations considered, privately-owned lands occur on less than one percent of the lands analyzed under the Caliente (ranges from 222 to 618 acres), Caliente-Chalk Mountain (ranges from 198 to 272 acres) and Valley Modified (ranges from 0 to 44 acres) corridors, but up to about five and seven percent of the lands analyzed under the Jean (ranges from 32 to 865 acres) and Carlin (ranges from 1,804 to 3,756 acres) corridors, respectively. The Caliente and Carlin corridors cross Timbisha-Shoshone trust lands, and a relatively short distance on the Nevada Test and Training Range, although variations are available that would avoid these lands. The Caliente corridor crosses two wilderness study areas, and the Valley Modified corridor passes through the Desert National Wildlife Range, although variations may be available to avoid these lands. The Caliente-Chalk Mountain corridor crosses land dedicated to testing and training activities of the U.S. Air Force and Department of Defense on the Nevada Test and Training Range; no variations are available that would avoid the Range under this corridor alternative.

Under any rail corridor alternative, water would be used for compaction of the rail bed and dust suppression, and by workers during construction. Water consumption would vary, primarily because of the length of the corridor, ranging from 320 acre-feet for the Valley Modified corridor to 710 acre-feet for the Caliente corridor.

During the 24-year shipping period, assuming standard nationwide rail routing practices, the incident-free (routine) collective dose to members of the public from the transportation of spent nuclear fuel and high-level radioactive waste by rail would result in less than one latent cancer fatality regardless of which corridor is selected. The difference in impacts among the corridors is minimal. Similarly, less than one latent cancer fatality would occur in the exposed worker population, and that is not affected by the Nevada corridor selection.

DOE also estimated the potential health effects to the general public that could result from a severe transportation accident during shipments to the repository (referred to in the Final EIS as a maximum reasonably foreseeable accident). If such an accident were to occur in a rural population setting, the collective radiological dose to members of the public would result in less than one latent cancer fatality. The probability that this accident could occur is extremely unlikely—about 2 chances in 1 million per year.

The environmental impacts identified in the Final EIS do not provide a clear basis for discriminating among alternative rail corridors in Nevada. Each of these alternatives would result in some impact to the environment and public health and safety. Construction of a rail line within any rail corridor would involve certain land use conflicts, and land disturbance with attendant impacts (although small, the impacts tend to increase with increasing corridor length). Radiation exposure to workers and the public in Nevada would be small, and the differences among the rail corridor alternatives also would be very small.

For these reasons, DOE does not consider the differences among the corridor alternatives to be sufficient to make any of them clearly environmentally preferable.

Finally, although the potential impacts of any of the five potential rail corridors would be small, they would be greater than the potential transportation-related impacts of the No-Action Alternatives. Nevertheless, as explained above, the impacts of proceeding with construction and operation of a repository at Yucca Mountain, including transportation, are relatively small and less than either of the No-Action Alternative scenarios. Part I (of this ROD) provides further comparison of the proposed action and the No-Action Alternative scenarios. In any event, given DOE's responsibilities under the Yucca Mountain Development Act and the NWPA, DOE believes it is obligated to proceed with appropriate transportation planning, including, given its selection of the mostly rail scenario in Nevada, the selection of a corridor in which to study possible alignments for the Nevada rail line, in preference to either No-Action Alternative scenario.

Comments on Preferred Rail Corridor

DOE noticed its preference for the Caliente corridor in the **Federal Register** (December 29, 2003; 68 FR 74951). The Carlin corridor was identified as a secondary preference. The Department has received comments on the preference announcement. Concerns expressed in these comments included the need for a comprehensive programmatic EIS covering all aspects of nuclear waste transportation to Yucca Mountain, avoidance of all major population centers with transportation routes, and provision of documentation supporting the preference decision. Other comments addressed the need for adequate opportunities for public participation and comment on the corridor preference announcement, including a request for cooperating agency status for any future rail alignment EIS. Selection of a corridor preference prior to having a mode of transportation decision was raised as a concern. In addition, there was confusion regarding the designation of the Carlin corridor as a secondary preference and its relationship to the upcoming rail alignment EIS process. Furthermore, commenters indicated that a rail line in the Caliente corridor would have significant negative impacts on cultural, socioeconomic, and wildlife resources, as well as a massive modern sculpture project. Others raised the potential for impacts to ranchers living in proximity to the proposed Caliente corridor, including questions regarding the design and operation of a rail line and the nature of measures that could mitigate resulting adverse impacts. Finally, several commenters thanked DOE for announcing its corridor preference, recognizing the challenges and opportunities and associated need to coordinate closely as DOE proceeds with transportation planning.

Comments calling for DOE to prepare a programmatic transportation EIS and the need to avoid all major Nevada population centers with transportation routes were addressed in the response to comments in the Final EIS. DOE believes a programmatic EIS to be unnecessary as its Final EIS provides the environmental impact information necessary to make certain broad transportation-related decisions (as described above in Transportation-Related Decisions).

With regard to avoiding population centers, the analyses of the Final EIS illustrate that potential public health and safety impacts would be so low for individuals who lived and worked along any route that individual impacts would not be discernible, even if the corresponding doses could be measured.

Although some commenters stated that DOE's intent in identifying the Carlin corridor as a secondary preference was unclear, the decision to select the Caliente corridor also represents DOE's intent to no longer consider the Carlin corridor for development of a rail line. This decision and the basis for not selecting the Carlin corridor are discussed below in Rail Corridor Decision and Basis for Rail Corridor Decision.

The remaining concerns and issues regarding potential environmental impacts associated with the development of a rail line, potential mitigation measures, and opportunities for public involvement and project participation will be addressed during the future preparation of a rail alignment EIS. As part of developing this documentation, DOE will identify and adopt measures to avoid or minimize environmental harm that could result from the construction and operation of a rail line within the Caliente corridor.

Rail Corridor Decision

In Part I of this Record of Decision, the Department selected, both on a national basis and in the State of Nevada, the mostly rail scenario. That decision is premised on the assumption that DOE will ultimately construct a rail line to connect the repository site to an existing rail line in the State of Nevada. To that end, the Department has decided to select the preferred rail corridor alternative, the Caliente corridor, in which to evaluate alignments for a rail line.

Basis for Rail Corridor Decision

The Department decided to evaluate alignments within the Caliente corridor for possible construction of a rail line based, in large part, on the analyses of the Final EIS. The Department, however, also considered other factors discussed below, such as potential for construction delay, direct and indirect costs of each alternative, and comments received from the public.

The Department considered irreversible and irretrievable commitments of resources and cumulative impacts in making its decision. There would be an irreversible and irretrievable commitment of resources, such as electric power, fossil fuels, construction materials, and water associated with the construction of a rail line in Nevada, although this commitment of resources would not significantly diminish the resources in question in Nevada. DOE recognizes that for all rail corridors there could be cumulative impacts from past, present and reasonably foreseeable future activities.

The Department considered potential land use conflicts and their potential to affect adversely construction of a rail line, as analyzed in the Final EIS in making this decision. If the Department were to select the Valley Modified rail corridor there may be conflicts with the Desert National Wildlife Range and local community plans for development in the greater Las Vegas metropolitan area. If the Department were to select the Caliente-Chalk Mountain corridor there would be conflicts with U.S. Air Force and Department of Defense testing and training activities directly related to national security interests on the Nevada Test and Training Range. If the Department were to select the Jean corridor it may require crossing relatively greater amounts of private land, and would pose greater potential land use conflicts because of its proximity to the greater Las Vegas metropolitan area. If the Department were to select the Carlin corridor it would also require crossing relatively greater amounts of private land. Moreover, little infrastructure, such as roads and electric power, is available over long segments, which would tend to make logistics during construction as well as emergency response capabilities more challenging. Overall, the Caliente rail corridor appears to have the fewest land use or other conflicts that could lead to substantial delays in acquiring the necessary land and rights-of-way, or in beginning construction.

DOE also considered concerns expressed by the public in Nevada. In these comments, the public stated that DOE should avoid rail corridors in the Las Vegas Valley.

The Department also considered the direct costs of constructing and operating a rail line, and the indirect costs resulting from potential delays in the availability of the rail line. The Jean and Valley Modified corridors are the shortest and have the lowest estimated construction costs. The Carlin and Caliente corridors are the longest and on the basis of construction cost alone would be more expensive to develop. However, delays in the construction of the rail line because of land use or other conflicts and the resulting inability to accept large amounts of spent nuclear fuel and high-level radioactive waste transported by a railroad to the repository in a timely manner could add to both the liability costs for delayed acceptance of commercial spent nuclear fuel and the costs of continued storage of DOE wastes.

Based on all of the above, DOE concludes that the Caliente corridor is preferable to the other corridors it evaluated as a potential corridor in which to construct a rail line. Therefore, DOE has decided to select the Caliente corridor as the one within which to evaluate possible alignments for the rail line connecting the repository to an existing main rail line in Nevada.

Use of All Practicable Means To Avoid or Minimize Harm—Rail Corridor

In the Final EIS, DOE identified transportation-related measures that would be implemented, and other measures that would require further consideration and refinement before adoption to avoid or minimize environmental harm. As described in Part I, this decision adopts all practicable measures to avoid or minimize adverse environmental impact that could result from the transportation of spent nuclear fuel and high-level radioactive wastes to a repository at Yucca Mountain appropriate at this stage of decision-making. Construction of a rail line will be consistent with applicable Federal, state and Native American tribal requirements. In addition to these measures, other potential mitigation measures associated with the construction of a rail line will be identified and evaluated during preparation of future NEPA documentation.

A.4 69 *FR* 18565, April 8, 2004

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DEPARTMENT OF ENERGY

Notice of Intent to Prepare an Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, NV

AGENCY: U.S. Department of Energy.

ACTION: Notice of intent.

SUMMARY: The U.S. Department of Energy (DOE or the Department) announces its intent to prepare an environmental impact statement (EIS) under the National Environmental Policy Act (NEPA) for the alignment, construction, and operation of a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials from a site near Caliente, Lincoln County, Nevada, to a geologic repository at Yucca Mountain, Nye County, Nevada. On April 2, 2004, the Department signed a Record of Decision announcing its selection, both nationally and in the State of Nevada, of the mostly rail scenario analyzed in the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS–0250F, February 2002) (Repository Final EIS). This decision will ultimately require the construction of a rail line to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada for the shipment of spent nuclear fuel and high-level radioactive waste, in the event that the Nuclear Regulatory Commission authorizes construction of the repository and receipt and possession of these materials at Yucca Mountain. To that end, the Department also decided to select the Caliente rail corridor[1] in which to examine possible alignments for construction of a rail line that would connect the repository at Yucca Mountain to an existing main rail line in Nevada. DOE is now announcing its intent to prepare this Rail Alignment EIS to assist in selecting this alignment. The EIS also would consider the potential construction and operation of a rail-to-truck intermodal transfer facility, proposed to be located at the confluence of an existing mainline railroad and a highway, to support legal-weight truck transportation until the rail system is fully operational.

DATES: The Department invites and encourages comments on the scope of the EIS (hereafter referred to as the Rail Alignment EIS) to ensure that all relevant environmental issues and reasonable alternatives are addressed. Public scoping meetings are discussed below in the **SUPPLEMENTARY INFORMATION** section. DOE will consider all comments received during the 45-day public scoping period, which starts with the publication of this Notice of Intent and ends May 24, 2004. Comments received after the close of the public scoping period will be considered to the extent practicable.

ADDRESSES: Written comments on the scope of this Rail Alignment EIS, questions concerning the proposed action and alternatives, requests for maps that illustrate the Caliente corridor and alternatives, or requests for additional information on the Rail Alignment EIS or transportation planning in general should be directed to: Ms. Robin Sweeney, EIS Document Manager, Office of National Transportation, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 011, Las Vegas, NV 89134, Telephone 1–800–967–3477, or via the Internet at *http://www.ocrwm.doe.gov* under "What's New."

FOR FURTHER INFORMATION CONTACT: For general information regarding the DOE NEPA process contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (EH–42), U.S. Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585, Telephone 202–586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

On July 23, 2002, the President signed into law (Pub. L. 107–200) a joint resolution of the U.S. House of Representatives and the U.S. Senate designating the Yucca Mountain site in Nye County, Nevada, for development as a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste. Subsequently, the Department issued a Record of Decision (April 2, 2004) to announce its selection, both nationally and in the State of Nevada, of the mostly rail scenario analyzed in the Repository Final EIS as the mode of transportation of spent nuclear fuel and high-level radioactive waste to the repository. Under the mostly rail scenario, the Department would rely on a combination of rail, truck and possibly barge to transport to the repository site at Yucca Mountain up to 70,000 metric tons of heavy metal (MTHM) of spent nuclear fuel and high-level radioactive waste. Most of the spent nuclear fuel and high-level radioactive waste, however, would be transported by rail.

The Department's decision to select the mostly rail scenario in Nevada will ultimately require the construction of a rail line to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada for the shipment of spent nuclear fuel and high-level radioactive waste in the event that the Nuclear Regulatory Commission authorizes construction of the repository and receipt and possession of these materials at Yucca Mountain. To that end, in the same Record of Decision, the Department also decided to select the Caliente rail corridor to study possible alignments for this rail line.

In the Repository Final EIS, DOE defined a rail corridor as a 0.25 miles (400-meter) wide strip of land that encompasses one of several possible alignments or specific locations within which DOE could build a rail line. The Caliente rail corridor was described as originating at an existing siding to the mainline railroad near Caliente, Nevada, and extending in a westerly direction to the northwest corner of the Nevada Test and Training Range, before turning south-southeast to the repository at Yucca Mountain.

In the Repository Final EIS, DOE also identified eight variations along the Caliente corridor that may minimize or avoid environmental impacts and/or mitigate construction complexities. Variations were defined as a strip of land 0.25 miles (400-meters) wide that describes a different route, from one point along the corridor to another point on the corridor. Thus, the Caliente corridor ranges between 318 miles (512 kilometers) and 344 miles (553 kilometers) in length, depending on the variations considered. In the Repository Final EIS, DOE did not identify variations for about 55 percent of the length of the corridor (hereafter those areas are referred to as "common segments").

DOE proposes to consider the common segments and the eight variations as preliminary alternatives to be evaluated in the Rail Alignment EIS. These alternatives are described in the *Preliminary Alternatives* section. In addition, DOE will consider other potential variations outside of the 0.25

[1] A corridor is a strip of land 0.25 miles (400 meters) wide that encompasses one of several possible routes through which DOE could build a rail line. An alignment is the specific location of a rail line in a corridor.

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mile-wide corridor that might minimize, avoid or mitigate adverse environmental impacts.

For purposes of analysis in the Rail Alignment EIS, a rail line alignment is defined as a strip of land 100 feet (30 meters) on either side of the centerline of the track within the Caliente corridor, passing through the common segments and variations. DOE will define regions of influence for each environmental resource (for example, biological or cultural resources) that will extend beyond the dimensions of the alignment and allow DOE to estimate environmental impacts over the geographic area in which the impact is likely to be realized. Within these regions of influence, DOE will estimate environmental impacts of the common segments and alternatives, both separately and in aggregate. In this way, the analyses of the Rail Alignment EIS will offer DOE flexibility to minimize, avoid or otherwise mitigate potential environmental impacts of the final alignment chosen for construction.

Proposed Action

In the Rail Alignment EIS, the Proposed Action is to determine a rail alignment, and to construct and operate a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials [2] from a site near Caliente, Lincoln County, Nevada to a geologic repository at Yucca Mountain, Nye County, Nevada. Under the Proposed Action, the Caliente rail line would be designed and built consistent with Federal Railroad Administration safety standards. Construction would take between three and four years.

Construction activities would include the development of construction support areas; construction of access roads to the rail line construction initiation points [3] and to major structures to be built, such as bridges and culverts; and movement of materials and equipment to the construction initiation points. The number and location of construction initiation points would be based on such variables as the length of the rail line, the construction schedule, the number of contractors used for construction, the number of structures to be built, the supply of materials, and the locations of existing access roads adjacent to the rail line.

The construction of the rail line would require the clearing and excavation of previously undisturbed lands, and the establishment of borrow and spoils [4] areas. To establish a stable base for the rail track, construction crews would excavate some areas and fill (add more soil to) others, as determined by terrain features. To the extent possible, material excavated from one area would be used in areas that required fill material. However, if the distance to an area requiring fill material were excessive, the excavated material would be disposed of in spoils areas, and a borrow area would be established adjacent to the area requiring fill material. Access roads to spoils and borrow areas would be built during the track base construction work.

Under the Proposed Action, DOE would construct a secure railyard and facilities at the operational interface with the mainline railroad near Caliente, Nevada. The facilities would include sidings connected to the mainline, and buildings and associated equipment for track and equipment maintenance, locomotive refueling, and train crew quarters.

DOE also will consider the potential construction and operation of a rail-to-truck intermodal transfer facility to support limited legal-weight truck transportation until the rail system is fully operational. This intermodal transfer facility could be constructed at the confluence of an existing mainline railroad and a highway.

Typical construction equipment (front-end loaders, power shovels, and other diesel-powered support equipment) would be used for clearing and excavation work. Trucks would spray water along graded areas for dust control and soil compaction. The fill material used along the rail line to establish a stable base for the track would be compacted to meet design requirements. Water could be shipped from other locations or obtained from wells drilled along the rail line.

Railroad track construction would consist of the placement of railbed material (sub-ballast), ballast (support and stabilizing materials for the rail ties), ties and rail over the completed railbed base. Other activities would include: installation of at-grade crossings, fencing as needed, train monitoring and signals and communication equipment, and final grading of slopes, rock-fall protection devices, and restoration of disturbed areas.

Operation of the Caliente rail line would be consistent with Federal Railroad Administration standards for maintenance, operations, and safety. A typical spent nuclear fuel and high-level radioactive waste train would consist of two diesel-electric locomotives; three or more rail cars containing spent nuclear fuel or high-level radioactive waste; buffer cars; and an escort car. A typical train carrying construction materials would not have buffer cars or an escort car.

At the Yucca Mountain repository, rail cars containing casks of spent nuclear fuel and high-level radioactive waste would move through a security check into the radiologically controlled area. The casks would be inspected and protective barriers removed, in preparation for waste handling at the repository. Rail cars carrying construction materials would be offloaded and the materials stockpiled on site.

Preliminary Alternatives

As required by the Council on Environmental Quality and Department regulations that implement NEPA, the Rail Alignment EIS will analyze and present the environmental impacts associated with the range of reasonable alternatives to meet DOE's purpose and need for a rail line, and a no action alternative. The preliminary alternatives for the alignment comprise a series of common segments and alternatives (maps may be obtained as described above in **ADDRESSES**). The Department is particularly interested in identifying and subsequently evaluating any additional reasonable alternatives that would reduce or avoid known or potential adverse environmental impacts, national security activities, features having aesthetic values, and land-use conflicts, or alternatives that should be eliminated from detailed consideration. This could include identifying alternatives that could avoid wilderness study areas or other land use conflicts. The preliminary alternatives include:

Interface With Mainline Railroad

Three alternatives are available to connect to the existing mainline railroad, each of which would intersect the common segment of the rail alignment about 4 miles (6.5 kilometers) southwest of Panaca, Nevada, along U.S. 93 in the Meadow Valley area. The Caliente Alternative would begin at the town of Caliente, enter Meadow Valley at Indian Cove and extend north

[2] Other materials refer to materials related to the construction (*e.g.*, reinforcing steel, cement) and operation (*e.g.*, waste packages, fuel oil) of the repository.

[3] DOE anticipates that construction of the rail line may occur at several locations simultaneously along the aligment.

[4] Borrow areas are areas outside of the rail alignment where construction personnel could obtain earthen materials such as aggregate for construction of the rail line. Spoil areas are areas outside of the alignment for the deposition of excess earthern materials excavated during construction of the rail line.

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through Meadow Valley to converge with the common segment. This alternative is about 10.5 miles (17 kilometers) in length.

The Eccles Alternative would begin at the Eccles siding along Clover Creek about 5 miles (8 kilometers) east of Caliente, trend generally north entering Meadow Valley on the southeast, and would then trend northward to converge with the common segment. This alternative is about 11 miles (18 kilometers) in length.

The Crestline Alternative would begin north of the Crestline siding in Sheep Spring Draw, extend west after crossing Lincoln County Road 75, and pass north of the Cedar Range. It would then veer northwesterly just north of Miller Spring Wash and converge with the common segment just south of the Big Hogback. This alternative is about 23 miles (38 kilometers) in length.

White River

The two White River Alternatives would depart from the common segment about 1.5 miles (2.5 kilometers) west of its crossing of the White River immediately west of State Route 318. The northern White River Alternative (WR1) would follow the White River, curve around the northern end of the Seaman Range, and then turn southwest entering Coal Valley. This alternative is about 25 miles (40 kilometers) in length.

The southern White River Alternative (WR2) would depart the same common segment but would extend westerly along the flanks of Timber Mountain, proceed through Timber Mountain Pass, and then enter Coal Valley. This alternative is about 18.5 miles (30 kilometers) in length.

Once in Coal Valley, both alternatives would merge with the Garden Valley Alternatives. Several options are available to merge the White River Alternatives with the Garden Valley Alternatives.

Garden Valley

The southern Garden Valley Alternative (GV2) would start about 2 miles (3 kilometers) east of the water gap located along Seaman Wash Road, proceed westward through the Golden Gate Mountains, and turn southwesterly through Garden Valley to reconnect to a common segment about 2.5 miles (4 kilometers) northeast of the pass between the Worthington Mountains and the Quinn Canyon Range. This alternative is about 17 miles (27.5 kilometers) in length.

The northern Garden Valley Alternative (GV1) would diverge from the same common segment as Alternative GV2, but would pass through the Golden Gate Mountains about 4 miles (6.5 kilometers) further north of the Alternative GV2 location. Alternative GV1 would then continue southwesterly through Garden Valley to reconnect with the common segment described for Alternative GV2. This alternative is about 19 miles (31 kilometers) in length.

Mud Lake

The Mud Lake Alternatives would depart a common segment located near the northwest corner of the Nevada Test and Training Range (previously known as Nellis Air Force Range) immediately north of Mud Lake. The western Mud Lake Alternative (ML1) would pass about 1.5 miles (2.5 kilometers) northwest of Mud Lake avoiding its western shoreline, and would extend southward to reconnect with a common segment. This alternative is about 3 miles (5 kilometers) in length.

The eastern Mud Lake Alternative (ML2) also would skirt Mud Lake to avoid its western shoreline and would reconnect with the same common segment as the western Mud Lake Alternative. This alternative is about 4 miles (6.5 kilometers) in length.

Goldfield

There are two alternatives associated with Goldfield. The western Goldfield Alternative (GF1), from its connection to Alternative ML1, would extend southward into the Goldfield Hills area passing about 1 mile (1.5 kilometers) east of Black Butte. This alternative would then turn east to pass about 1 mile (1.5 kilometers) northeast of Espina Hill and then would bear south to pass about 1 mile (1.5 kilometers) east of Blackcap Mountain. Alternative GF1 would then continue in a southerly direction following an abandoned rail line to reconnect to a common segment located about 2.5 miles (4 kilometers) north-northeast of Ralston, Nevada. This alternative is about 25 miles (41 kilometers) in length.

From its connection with Alternative ML2, the eastern Goldfield Alternative (GF2) would extend south-southeast into the Nevada Test and Training Range, and then would emerge from the Range turning southwest to converge with the western Goldfield Alternative (GF1) as it enters Stonewall Flat. This alternative is about 22 miles (35.5 kilometers) in length.

DOE is aware of concerns raised by the Department of Defense and the U.S. Air Force regarding the alternatives that intersect the Nevada Test and Training Range lands, and will consult with the Department of Defense and the U.S. Air Force during the Rail Alignment EIS process to ensure the transportation alignment selected does not compromise public safety, national security interests, or training and testing at the Nevada Test and Training Range.

Bonnie Claire

Bonnie Claire comprises two alternatives that would depart a common segment located about 3.3 miles (5.5 kilometers) southeast of Lida Junction, Nevada. The western Bonnie Claire Alternative (BC1) would follow an abandoned rail line to cross U.S. 95 about 1 mile (1.5 kilometers) south of Stonewall Pass, and would then trend southeast paralleling U.S. 95 on the west across Sarcobatus Flat. This alternative would then cross State Route 267 about 1.5 miles (2.5 kilometers) southwest of Scotty's Junction, continuing southeasterly until crossing U.S. 95 again on the eastern edge of Sarcobatus Flat about 14 miles (22.5 kilometers) northwest of Springdale, Nevada. This alternative is about 22 miles (35.5 kilometers) in length.

The eastern Bonnie Claire Alternative (BC2) would parallel the contours of Stonewall Mountain to the southeast and would then extend south, adjacent to the western edge of Pahute Mesa. This alternative would then parallel the northern side of U.S. 95 about 1 mile (1.5 kilometers) until it converges with the western Bonnie Claire Alternative (BC1) on the eastern edge of Sarcobatus Flat. This alternative is about 25.5 miles (41 kilometers) in length.

DOE is aware of concerns raised by the Department of Defense and the U.S. Air Force regarding the alternatives that intersect the Nevada Test and Training Range lands, and will consult with the Department of Defense and the U.S. Air Force during the Rail Alignment EIS process to ensure the transportation alignment selected does not compromise public safety, national security interests, or training and testing at the Nevada Test and Training Range.

Oasis Valley

Oasis Valley includes two alternatives that would avoid naturally-occurring springs. Both alternatives would depart a common segment about 2 miles (3 kilometers) east-northeast of Oasis Mountain. Alternative OV1 is about 3 miles (5 kilometers) in length. Alternative OV2, which is about 3.5 miles (5.5 kilometers) in length, would cross Oasis Valley further to the east of Alternative OV1, thereby increasing the distance to the springs.

Beatty Wash

The Beatty Wash alternatives would depart from a common segment about 3

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miles (5 kilometers) east-northeast of the hot springs north of Beatty and about 2 miles (3 kilometers) north-northeast of Beatty Wash. The eastern Beatty Wash Alternative (BW2) would extend east for about 5 miles (8 kilometers), then turn southward crossing a pass about 1 mile (1.5 kilometers) east of the Silicon and Thompson Mines. Alternative BW2 would then turn south to converge with Alternative BW1 about 4 miles (6.5 kilometers) east-northeast of Merklejoho Peak. This alternative is about 14 miles (22 kilometers) in length.

The western Beatty Wash Alternative (BW1) would extend south from the common segment described for Alternative BW2, crossing Beatty Wash and proceeding to the west of the Silicon and Thompson Mines before reconnecting with a common segment. This alternative is about 8 miles (13 kilometers) in length.

No Action Alternative

The No Action Alternative would evaluate the consequences of not constructing a rail line in Nevada for the transportation of spent nuclear fuel, high-level radioactive waste and other materials. Under the No Action Alternative, these materials would be shipped by legal-weight and heavy-haul truck within the State of Nevada to a repository at Yucca Mountain. About 53,000 legal-weight truck and 300 heavy-haul truck shipments of spent nuclear fuel and high-level radioactive waste would be required.

Environmental Issues and Resources To Be Examined

To facilitate the scoping process, DOE has identified a preliminary list of issues and environmental resources that it may consider in the Rail Alignment EIS. The list is not intended to be all-inclusive or to predetermine the scope or alternatives of the Rail Alignment EIS, but should be used as a starting point from which the public can help DOE define the scope of the EIS. DOE anticipates incorporating by reference the relevant analyses of the Repository Final EIS, supplemented as appropriate.

- Potential impacts to the concept of multiple use as it applies to public land use planning and management specified by the Federal Land Policy and Management Act of 1976.
- Potential impacts to land use and ownership.
- Potential impacts to plants, animals and their habitats, including impacts to wetlands, and threatened and endangered and other sensitive species.
- Potential impacts to cultural and Native American resources.
- Potential impacts to paleontological resources.
- Potential impacts to the public from noise and vibration.
- Potential impacts to the general public and workers from radiological exposures during incident-free operations of the rail line in Nevada.
- Potential impacts to the general public and workers from radiological exposures from potential accidents during operations of the rail line in Nevada.
- Potential impacts to water resources and floodplains.
- Potential impacts to aesthetic values.
- Potential disproportionately high and adverse impacts to low-income and minority populations (environmental justice).
- Irretrievable and irreversible commitment of resources.
- Compliance with applicable Federal, state and local requirements.

The Department specifically invites comments on the following:

1. Should additional alternatives be considered that might minimize, avoid or mitigate adverse environmental impacts (for example, looking beyond the 0.25 mile wide corridor, avoiding wilderness study areas, Native American Trust Lands, or encroachment on the Nevada Test and Training Range)?
2. Should any of the preliminary alternatives be eliminated from detailed consideration?
3. Should additional environmental resources be considered?
4. Should DOE allow private entities to ship commercial commodities on its rail line?
5. What mitigation measures should be considered?
6. Are there national security issues that should be addressed?

Schedule

The DOE intends to issue the Draft Rail Alignment EIS early in 2005 at which time its availability will be announced in the **Federal Register** and local media. A public comment period will start upon publication of the Environmental Protection Agency's Notice of Availability in the **Federal Register**. The Department will consider and respond to comments received on the Draft Rail Alignment EIS in preparing the Final Rail Alignment EIS.

Other Agency Involvement

The Department expects to invite the following agencies to be cooperating agencies in the preparation of the Rail Alignment EIS: U.S. Bureau of Land Management, the U.S. Air Force, and the U.S. Surface Transportation Board. These agencies were selected because they have management and regulatory authority over lands traversed by an alternative rail alignment within the Caliente rail corridor, or special expertise germane to the construction and operation of a rail line. DOE will consult with the U.S. Bureau of Indian Affairs, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Nuclear Regulatory Commission, Native American Tribal organizations, the State of Nevada, and Nye, Lincoln and Esmeralda Counties regarding the environmental and regulatory issues germane to the Proposed Action. DOE invites comments on its identification of cooperating and consulting agencies and organizations.

Public Scoping Meetings

DOE will hold public scoping meetings on the Rail Alignment EIS. The meetings will be held at the following locations and times:

- Amargosa Valley, Nevada. Longstreet Inn and Casino, Highway 373, May 3, 2004 from 4–8 p.m.
- Goldfield, Nevada. Goldfield Community Center, 301 Crook Street, May 4, 2004 from 4–8 p.m.
- Caliente, Nevada. Caliente Youth Center, U.S. Highway 93, Caliente, Nevada, May 5, 2004 from 4–8 p.m.

The public scoping meetings will be an open meeting format without a formal presentation by DOE. Members of the public are invited to attend the meetings at their convenience any time during meeting hours and submit their comments in writing at the meeting, or in person to a court reporter who will be available throughout the meeting. This open meeting format increases the opportunity for public comment and provides for one-on-one discussions with DOE representatives involved with the Rail Alignment EIS and Nevada transportation project.

The public scoping meetings will be held during the public scoping comment period. The comment period begins with publication of this NOI in the **Federal Register** and closes May 24, 2004. Comments received after this date will be considered to the extent practicable. Written comments may be provided in writing, facsimile, or by email to Ms. Robin Sweeney, EIS Document Manager (see **ADDRESSES** above).

Public Reading Rooms

Documents referenced in this Notice of Intent and related information are available at the following locations: Beatty Yucca Mountain Information Center, 100 North E. Avenue, Beatty, NV

A.5 69 *FR* 22496, April 26, 2004

22496 Federal Register / Vol. 69, No. 80 / Monday, April 26, 2004 / Notices

DEPARTMENT OF ENERGY

Comment Period Extension and Additional Public Scoping Meetings for an Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, NV

AGENCY: U.S. Department of Energy.

ACTION: Notice of comment period extension and additional public meetings.

SUMMARY: On April 8, 2004, the U.S. Department of Energy (DOE) published a Notice of Intent (69 FR 18565) announcing its intent to prepare an environmental impact statement (EIS) under the National Environmental Policy Act for the alignment, construction, and operation of a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials from a site near Caliente, Lincoln County, Nevada, to a geologic repository at Yucca Mountain, Nye County, Nevada, and announced three public scoping meetings during a 45-day public comment period ending May 24, 2004. In response to a request from the State of Nevada, DOE is now announcing two additional public meetings, one in Las Vegas, Nevada, and one in Reno, Nevada, and extending the comment period to June 1, 2004.

DATES: The additional public meetings will be held at the following locations and times:

- Las Vegas, Nevada. Las Vegas Yucca Mountain Information Center, 4101 B Meadows Lane. May 10, 2004, from 4–8 p.m.
- Reno, Nevada. University of Nevada-Reno. Lawlor Event Center-Silver and Blue Room, 15th & North Virginia. May 12, 2004, from 4–8 p.m.

The comment period on the Notice of Intent is being extended to June 1, 2004. DOE will consider comments on the proposed scope of the Rail Alignment EIS received after June 1, 2004, to the extent practicable.

ADDRESSES: Written comments on the scope of this Rail Alignment EIS, questions concerning the proposed action and alternatives, requests for maps that illustrate the Caliente corridor and alternatives, or requests for additional information on the Rail Alignment EIS or transportation planning in general should be directed to: Ms. Robin Sweeney, EIS Document Manager, Office of National Transportation, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 011, Las Vegas, NV 89134, telephone 1–800–967–3477, or via the Internet at *http://www.ocrwm.doe.gov* under "What's New."

Issued in Washington, DC, on April 20, 2004.

Margaret S. Y. Chu,

Director, Office of Civilian Radioactive Waste Management.

[FR Doc. 04–9524 Filed 4–23–04; 8:45 am]

BILLING CODE 6450–01–P

A.6 69 *FR* 23177, April 28, 2004

Federal Register / Vol. 69, No. 82 / Wednesday, April 28, 2004 / Notices 23177

DEPARTMENT OF ENERGY

Comment Period Extension and Additional Public Scoping Meetings for an Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, Nevada; Correction

AGENCY: Department of Energy.

ACTION: Notice of Comment Period Extension and Additional Public Meetings; correction.

SUMMARY: The Department of Energy published a document in the **Federal Register** of April 26, 2004, concerning the additional scoping meetings to be held in support of the Rail Alignment EIS. The document contained an incorrect date and location for the Las Vegas, NV scoping meetings.

FOR FURTHER INFORMATION CONTACT: Robin Sweeney at 1-800-967-3477.

Correction

In the **Federal Register** of April 26, 2004, in FR Vol 69, No. 80, on Page 22496, in the first column, correct the date and location for the Las Vegas, NV scoping meeting to read: Las Vegas, Nevada, Cashman Center, Rooms 103-106, 850 Las Vegas Blvd. North, May 17, 2004, from 4-8 p.m.

Dated: April 26, 2004.

Margaret S.Y. Chu,

Director, Office of Civilian Radioactive Waste Management.

[FR Doc. 04-9719 Filed 4-27-04; 8:45 am]

BILLING CODE 6450-01-P

A.7 70 *FR* 51029, August 29, 2005

Federal Register / Vol. 70, No. 166 / Monday, August 29, 2005 / Notices 51029

DEPARTMENT OF ENERGY

Notice of Availability of the Environmental Assessment Supporting the Department of Energy's Application to the Department of the Interior for a Public Land Order To Withdraw Public Lands Within and Around the Caliente Rail Corridor, Nevada, From Surface Entry and New Mining Claims

AGENCY: Office of Civilian Radioactive Waste Management, U.S. Department of Energy.

ACTION: Notice of availability.

SUMMARY: This notice announces the availability, and opportunity for public review and comment, of the environmental assessment (EA) that supports the Department of Energy's (DOE) application to the Department of the Interior, filed with the Bureau of Land Management (BLM), for a Public Land Order to withdraw public lands within and surrounding the Caliente Rail Corridor. As applied for, the withdrawal would preclude surface entry and new mining claim locations for a 20 year period.

DATES: Comments should be received by DOE no later than September 28, 2005.

ADDRESSES: Comments, or requests for copies of the draft EA, should be sent to Lee Bishop, EA Document Manager, United States Department of Energy, 1551 Hillshire Drive, Las Vegas, NV 89134. Requests for copies of the draft EA may also be made by calling 1–800–225–6972. The draft EA and electronic comment forms are available at *http://www.ocrwm.doe.gov*. Comments may also be faxed to 1–800–967–0739.

FOR FURTHER INFORMATION CONTACT: Lee Bishop, EA Document Manager, at the address above or at 1–800–225–6972.

SUPPLEMENTARY INFORMATION: A notice of proposed withdrawal was published in the **Federal Register** on December 29, 2003 (68 FR 74965–74968), stating that the Bureau of Land Management had received an application from DOE to withdraw for 20 years approximately 308,600 acres of public land from surface entry and mining locations while DOE evaluates the land for the potential construction, operation, and maintenance of a branch rail line. The rail line would be used for the transportation of spent nuclear fuel and high-level radioactive waste as provided under the Nuclear Waste Policy Act of 1982, as amended (42 U.S.C. 10101 *et seq.*). BLM held public meetings on the application in June 2004.

In accordance with 43 CFR 2310.3–2(b)(3), DOE has prepared a draft EA to support its application, with the BLM participating as a cooperating agency. The application seeks a Public Land Order for the purpose of precluding surface entry and the location of new mining claims which could interfere with the evaluation of the land. The proposed Public Land Order would not affect existing mining claims or other activities such as grazing rights, water rights, and recreational uses.

The draft EA may be reviewed on the Internet at *http://www.ocrwm.doe.gov*. Copies of the EA may also be obtained by contacting Mr. Lee Bishop (see address above). Comments may be submitted to Mr. Bishop or through the comment form at the above website, and should be received by September 28, 2005.

Three public meetings on the draft EA will be held as follows:

Monday, September 12, 2005, 4 p.m. to 8 p.m., Longstreet Inn & Casino, Highway 373, Amargosa Valley, NV;

Tuesday, September 13, 2005, 4 p.m. to 8 p.m., Goldfield School Gymnasium, 233 Ramsey, Goldfield, NV; and

Thursday, September 15, 2005, 4 p.m. to 8 p.m., Caliente Youth Center, U.S. Highway 93, Caliente, NV.

Comments received will be considered in finalizing the EA. After the EA is finalized it will be formally submitted to the BLM. The BLM will subsequently make a recommendation to the Secretary of the Interior, who will make a final determination regarding DOE's application for a Public Land Order.

Issued in Washington, DC.

Paul M. Golan,

Principal Deputy Director, Office of Civilian Radioactive Waste Management.

[FR Doc. 05–17143 Filed 8–26–05; 8:45 am]

BILLING CODE 6450–01–P

A.8 70 *FR* 76854, December 28, 2005

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DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NV–040–1920–ET–4662; NVN–77880; 6–08807]

Public Land Order No. 7653; Withdrawal of Public Lands for the Department of Energy To Protect the Caliente Rail Corridor; Nevada

AGENCY: Bureau of Land Management, Interior.

ACTION: Public Land Order.

SUMMARY: This order withdraws approximately 308,600 acres of public lands within the Caliente Rail Corridor, Nevada, from surface entry and the location of new mining claims, subject to valid existing rights, for a period of 10 years to allow the Department of Energy to evaluate the lands for the potential construction, operation, and maintenance of a rail line which would be used to transport spent nuclear fuel and high-level radioactive waste to the proposed Yucca Mountain Repository as part of the Department of Energy's responsibility under the Nuclear Waste Policy Act, as amended, 42 U.S.C. 10101 *et seq.*

DATES: Effective Date: December 28, 2005.

FOR FURTHER INFORMATION CONTACT: Dennis J. Samuelson, BLM Nevada State Office, P.O. Box 12000, Reno, Nevada 89520, 775–861–6532.

SUPPLEMENTARY INFORMATION: The evaluation of the Caliente Rail Corridor will assist the Department of Energy to determine through the preparation of the Caliente Corridor rail alignment environmental impact statement, conducted pursuant to the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 *et seq.*, whether to construct the rail line in that location. Construction of a rail line within the Caliente Rail Corridor would require that the Department of Energy apply for and receive a right-of-way grant from the Bureau of Land Management in accordance with the Federal Land Policy and Management Act, as amended, 43 U.S.C. Subchapter V.

Order

By virtue of the authority vested in the Secretary of the Interior by section 204 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714 (2000), it is ordered as follows:

1. Subject to valid existing rights, the following described public lands are hereby withdrawn from settlement, sale, location, or entry under the general land laws, including the United States mining laws (30 U.S.C. Ch. 2 (2000)), but not from leasing under the mineral leasing laws, for a period of 10 years, to allow the Department of Energy to evaluate lands within the Caliente Rail Corridor for the potential construction, operation, and maintenance of a rail line which would be used to transport spent nuclear fuel and high-level radioactive waste to the proposed Yucca Mountain Repository as part of the Department of Energy's responsibility under the Nuclear Waste Policy Act, as amended, 42 U.S.C. 10101 *et seq.*

A corridor 1-mile in width that contains a portion of, or is wholly encompassed within the following sections and/or quarter sections and government lots:

T. 1 N., R. 43 E.,
Sec. 23, S½;
Sec. 24, NE¼ and S½;
Secs. 25 and 26;
Sec. 27, E½;
Secs. 34, 35, and 36.
T. 1 S., R. 43 E.,
Sec. 1, lots 2, 3, and 4, S½NW¼, and SW¼;
Secs. 2 and 3;
Sec. 4, E½;
Sec. 9, E½;
Secs. 10 and 11;
Sec. 12, W½;
Sec. 13;
Sec. 14, E½ and NW¼;
Sec. 15;
Sec. 16, E½;
Sec. 21;
Sec. 22, NE¼ and W½;
Sec. 23, NE¼;
Sec. 24;
Sec. 25, E½;
Sec. 27, W½;
Secs. 28 and 33;
Sec. 34, W½.
T. 2 S., R. 43 E.,
Sec. 3, lots 3 and 4, S½NW¼, and SW¼;
Secs. 4 and 9;
Sec. 10, W½;
Sec. 15, W½;
Sec. 16 (except patented land);
Sec. 20, SE¼ (except patented land);
Sec. 21 (except patented land);
Sec. 22, W½ (except patented land);
Sec. 27, SW¼ (except patented land);
Sec. 28 (except patented land);

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Sec. 29, E½ (except patented land);
Sec. 32, NE¼ (except patented land);
Secs. 33 and 34 (except patented land);
Sec. 35, W½ and SE¼ (except patented land);
Sec. 36, SW¼.
T. 3 S., R. 43 E.,
Secs. 1, 2, and 3 (except patented land);
Sec. 4, NE¼ (except patented land);
Sec. 10 (except patented land);
Secs. 11 and 12;
Sec. 13, NE¼ and W½;
Sec. 14;
Sec. 15, E½;
Sec. 22, E½;
Secs. 23 to 26, inclusive;
Sec. 27, E½;
Sec. 34, E½;
Secs. 35 and 36.
T. 4 S., R. 43 E.,
Sec. 1, lots 2, 3, and 4, S½NE¼, S½NW¼, and SW¼;
Sec. 2;
Sec. 3; lots 1 and 2, S½NE¼, and S½;
Secs. 10 and 11;
Sec. 12, W½;
Secs. 14, 15, and 22;
Sec. 23, W½;
Sec. 26, NW¼;
Sec. 27;
Sec. 28, E½;
Sec. 33;
Sec. 34, NE¼ and W½.
T. 5 S., R. 43 E., Unsurveyed
Sec. 3, NW¼;
Secs. 4, 5, 8, 9, 15, and 16;
Sec. 17 (except patented land);
Secs. 21, 22, 27, 28, 33, 34, and 35.
T. 6 S., R. 43 E., Unsurveyed
Secs. 1, 2, 3, Secs. 10 to 15, inclusive, and Sec. 23;
Secs. 24 and 25 (except patented land);
Sec. 26;
Sec. 27, E½;
Sec. 34, E½;
Secs. 35 and 36.
T. 7 S., R. 43 E., Unsurveyed
Secs. 1 and 2;
Sec. 3, E½;
Secs. 11 to 14, inclusive, Secs. 24 and 25.
T. 1 N., R. 44 E.,
Sec. 19, lots 2, 3, and 4, E½SW¼, and E½;
Secs. 20, 21, and 22;
Sec. 23, W½ and SE¼;
Sec. 24, S½;
Secs. 25 and 26;
Sec. 27, N½;
Sec. 28, N½;
Sec. 29, N½;
Sec. 30, lots 1, 2, and 3, NE¼, E½NW¼, and E½SW¼.
T. 7 S., R. 44 E., Partially Surveyed
Secs. 6, 7, 17, 18, 19, and 20;
Sec. 21, NE¼ and N½NW¼;
Sec. 27;
Sec. 29, W½;
Sec. 29, SE¼ (reserved minerals only);
Secs. 30 and 31.
T. 8 S., R. 44 E., Partially Surveyed
Sec. 2, E½;
Sec. 9, N½ (reserved minerals only);
Sec. 9, S½;
Sec. 10, N½ (reserved minerals only);
Sec. 10, S½;
Sec. 11, SW¼;
Sec. 12, E½;
Secs. 13 to 16, inclusive;
Sec. 22, NE¼;
Secs. 23 to 26, inclusive, and Sec. 36.
T. 1 N., R. 45 E.,
Sec. 19, lot 4, E½SW¼, and SE¼;
Sec. 20, S½;
Sec. 25, S½;
Sec. 26, NW¼ and S½;
Secs. 27 to 30, inclusive;
Sec. 32, N½;
Sec. 33, N½;
Sec. 34, N½;
Secs. 35 and 36.
T. 8 S., R. 45 E., Unsurveyed
Sec. 19 and Secs. 28 to 33, inclusive.
T. 9 S., R. 45 E., Unsurveyed
Secs. 2 to 6, inclusive, Secs. 8 to 14, inclusive, and Sec. 24.
T. 1 N., R. 46 E.,
Sec. 25, NE¼ and S½;
Sec. 26, S½;
Sec. 27, S½;
Sec. 28, S½;
Sec. 29, S½;
Sec. 30, lot 4, E½SW¼, and SE¼;
Secs. 31 to 36, inclusive.
T. 9 S., R. 46 E., Unsurveyed
Sec. 7 and Secs. 17 to 21, inclusive;
Sec. 22, SW¼;
Secs. 26 to 29, inclusive, and Secs. 33 to 36, inclusive.
T. 10 S., R. 46 E., Unsurveyed
Secs. 1, 2, 12, and 13.
T. 1 N., R. 47 E.,
Sec. 1, lots 1 to 4, inclusive, S½NE¼, S½NW¼, and SW¼;
Sec. 2;
Sec. 3, SE¼;
Secs. 10 and 11;
Sec. 12, NW¼;
Sec. 14, NW¼;
Sec. 15;
Sec. 16, NE¼ and S½;
Sec. 20, NE¼ and S½;
Sec. 21;
Sec. 22, NE¼ and W½;
Sec. 28, NE¼ and W½;
Secs. 29 and 30;
Sec. 31, lots 1, 2 and 3, NE¼, and E½NW¼;
Sec. 32 NW¼.
T. 2 N., R. 47 E.,
Sec. 25, NE¼ and S½;
Sec. 35, E½;
Sec. 36.
T. 10 S., R. 47 E., Partially Surveyed
Sec. 6, SW¼;
Secs. 7 and 8;
Sec. 9, SW¼;
Sec. 15, NW ¼ and S½;
Secs. 16, 17, and 18;
Sec. 21, N½ and SE½;
Sec. 22, E½NE¼, W½, and SE¼SE¼;
Sec. 23, S½NW¼ and SW¼;
Sec. 26, W½;
Sec. 27; E½ and SW¼SW¼;
Sec. 28, NE¼;
Sec. 34;
Sec. 35, W½ and SE¼.
T. 11 S., R. 47 E.,
Sec. 1, SW¼;
Sec. 2;
Sec. 3, lots 1 and 2, S½NE¼, and SE¼;
Sec. 11;
Sec. 12, W½ and SE¼;
Sec. 13;
Sec. 14, N½ and SE¼;
Sec. 24, N½ and SE¼;
Sec. 25, NE¼.
T. 2 N., R. 48 E.,
Sec. 2, lots 3 and 4, and S½NW¼;
Sec. 3;
Sec. 4, lot 1, S½NE¼, and S½;
Sec. 8, E½;
Sec. 9;
Sec. 10, NE¼ and W½;
Sec. 16, NE¼ and W½;
Sec. 17;
Sec. 18, SE¼;
Sec. 19, lots 3 and 4, E½, and E½SW¼;
Sec. 20;
Sec. 21, NW¼;
Sec. 29, NW¼;
Sec. 30;
Sec. 31, lots 1 to 4, inclusive, NE¼, and E½NW¼.
T. 3 N., R. 48 E.,
Sec. 13, E½ and SW¼;
Sec. 23, E½;
Sec. 24;
Sec. 25, N½ and SW¼;
Sec. 26;
Sec. 27, SE¼;
Secs. 34 and 35;
Sec. 36, NW¼.
T. 11 S., R. 48 E., Unsurveyed
Sec. 7, S½;
Secs. 8 to 11, inclusive, Secs. 14 to 22, inclusive, and Secs. 27 to 34, inclusive.
T. 12 S., R. 48 E., Unsurveyed
Secs. 2 to 6, inclusive;
Sec. 9, NE¼;
Secs. 10 and 11;
Sec. 13, SW¼;
Secs. 14, 15, and Secs. 23 to 26, inclusive;
Sec. 35, E½;
Sec. 36.
T. 13 S., R. 48 E., Unsurveyed
Secs. 9, 10, 14, 15, 16, and Secs. 22 to 26, inclusive;
Sec. 36, NE¼.
T. 3 N., R. 49 E.,
Sec. 2, lots 3 and 4, and S½NW¼;
Secs. 3 and 4;
Sec. 5, SE¼;
Sec. 7, E½SW¼ and SE¼;
Secs. 8 and 9;
Sec. 10, NW¼;
Sec. 16, NW¼;
Sec. 17, N½ and SW¼;
Sec. 18;
Sec. 19, lots 1, 2, and 3, NE¼, and E½NW¼.
T. 4 N., R. 49 E.,
Sec. 24, SE¼;
Sec. 25;
Sec. 26, NE¼ and S½;
Sec. 33, SE¼;
Secs. 34 and 35;
Sec. 36, N½ and SW¼.
T. 12 S., R. 49 E., Unsurveyed
Sec. 31.
T. 13 S., R. 49 E., Unsurveyed
Secs. 13, 14,
Secs. 22 to 27, inclusive, and
Secs. 29 to 36, inclusive.
T. 14 S., R. 49 E., Unsurveyed
Secs. 1 to 5, inclusive,
Secs. 8 to 11, inclusive,
Secs. 15 and 16.
T. 4 N., R. 49½ E., Unsurveyed
Secs. 25, 26, 27, 34, 35, and 36.

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T. 1 N., R. 50 E.,
Sec. 1, lots 1 and 2, S½NE¼, and SE¼;
Sec. 12, NE¼ (excluding Kawich Wilderness Study Area).
T. 2 N., R. 50 E.,
Sec. 1;
Sec. 2, lots 1 and 2, S½NE¼, and SE¼;
Sec. 11, E½;
Secs. 12 and 13;
Sec. 14, NE¼;
Secs. 24 and 25;
Sec. 36, E½ and NW¼.
T. 3 N., R. 50 E., Unsurveyed
Secs. 2, 3, 4, 10, 11, and 14;
Sec. 15, E½;
Sec. 22, NE¼;
Secs. 23 to 26, inclusive, Secs. 35 and 36.
T. 3½ N., R. 50 E., Unsurveyed
Secs. 33 and 34.
T. 4 N., R. 50 E., Partially Surveyed
Secs. 30 and 31;
Sec. 32, SW¼.
T. 13 S., R. 50 E., Unsurveyed
Secs. 30 and 31.
T. 1 N., R. 51 E.,
Sec. 6 (excluding South Reveille Wilderness Study Area);
Sec. 7 (excluding Kawich and South Reveille Wilderness Study Areas);
Sec. 17 (excluding South Reveille Wilderness Study Area);
Sec. 18 (excluding Kawich and South Reveille Wilderness Study Areas);
Sec. 19 NE¼ (excluding Kawich Wilderness Study Area);
Sec. 20 and 28 (excluding South Reveille Wilderness Study Area);
Sec. 29, E½ and NW¼;
Sec. 33, E½ and NW¼;
Sec. 34 (excluding South Reveille Wilderness Study Area).
T. 2 N., R. 51 E.,
Sec. 18, lots 3 and 4;
Sec. 19, lots 1 to 4, inclusive, E½NW¼, and E½SW¼;
Sec. 30, lots 1 to 4, inclusive, E½NW¼, E½SW¼, and SE¼;
Sec. 31, (excluding South Reveille Wilderness Study Area).
T. 1 S., R. 51 E., Unsurveyed
Sec. 2, (excluding South Reveille Wilderness Study Area);
Sec. 3;
Secs. 11, 12, and 13 (excluding South Reveille Wilderness Study Area);
Sec. 14, E½;
Sec. 24; Sec. 25, E½;
Sec. 36, E½.
T. 1 S., R. 51½ E., Unsurveyed
Secs. 19, 29, and 30 (excluding South Reveille Wilderness Study Area);
Sec. 31;
Sec. 32 (excluding South Reveille Wilderness Study Area).
T. 2 S., R. 51½ E., Unsurveyed
Secs. 4 and 5 (excluding South Reveille Wilderness Study Area);
Secs. 6, 7, and 8;
Sec. 9, (excluding South Reveille Wilderness Study Area);
secs. 16 and 17;
Sec. 18, NE¼;
Sec. 20, NE¼;
Sec. 21.
T. 2 S., R. 52 E., Unsurveyed
Secs. 7 and 11 (excluding South Reveille Wilderness Study Area);
Secs 12 and 13;
Secs. 14 to 18, inclusive (excluding South Reveille Wilderness Study Area);
Secs. 19, 20, and 21;
Sec. 22, N½;
Sec. 23, N½.
T. 1 S., R. 53 E.,
Sec. 25;
Sec. 35, E½ and SW¼;
Sec. 36.
T. 2 S., R. 53 E.,
Sec. 1, lots 3 and 4, and S½NW¼;
Sec. 2;
Sec. 3, lot 1, S½NE¼, and S½;
Sec. 7, lot 4, E½SW¼, and SE¼;
Sec. 8, S½;
Secs. 9 and 10;
Sec. 11, N½ and SW¼;
Sec. 15, N½;
Sec. 16, N½ and SW¼;
Secs. 17 and 18.
T. 1 S., R. 54 E.,
Sec. 1, S½NE¼ and S½;
Sec. 10, SE¼;
Secs. 11 and 12;
Sec. 13, N½;
Secs. 14 and 15;
Sec. 16, SE¼;
Sec. 19, lots 3 and 4, E½SW¼, and SE¼;
Sec. 20, S½;
Secs. 21 and 22;
Sec. 23, NW¼;
Sec. 28, N½ and SW¼;
Secs. 29 and 30;
Sec. 31, lots 1 and 2, and E½NW¼;
Sec. 32, NW¼.
T. 1 N., R. 55 E.,
Sec. 13, S½;
Sec. 14, SE¼;
Sec. 21, S½;
Sec. 22, NE¼ and S½;
Secs. 23 and 24;
Sec. 25, NW¼;
Sec. 26, N½;
Secs. 27 and 28;
Sec. 29, NE¼ and S½;
Sec. 30, SE¼;
Secs. 31 and 32;
Sec. 33, N½.
T. 1 S., R. 55 E.,
Sec. 5, lot 4 and S½NW¼;
Sec. 6;
Sec. 7, lots 1, 2, and 3, NE¼, and E½NW¼.
T. 1 N., R. 56 E., Partially Surveyed
Sec. 1;
Sec. 2, S½NE¼ and SE¼;
Sec. 9, S½;
Secs. 10 and 11;
Sec. 12, NE¼ and W½;
Sec. 13, NW¼;
Sec. 14, N½;
Secs. 15, 16, and 17;
Sec. 18, lots 3 and 4, E½, and E½SW¼;
Sec. 19, lots 1, 2, 3, NE¼, E½NW¼, NE¼SW¼, and NW¼SE¼;
Sec. 20, N½;
Sec. 21, N½.
T. 2 N., R. 56 E., Partially Surveyed
Sec. 36.
T. 1 N., R. 57 E., Partially Surveyed
Sec. 3, lots 3 and 4, and S½NW¼;
Sec. 4, lots 1 to 4, inclusive, and S½NW¼;
Sec. 5, lots 1 to 4, inclusive, S½NE¼, S½NW¼, and W½SW¼;
Sec. 6.
T. 2 N., R. 57 E.,
Sec. 13;
Sec. 14, SE¼;
Sec. 22, S½;
Secs. 23 to 28, inclusive;
Sec. 29, S½;
Sec. 31, lots 3 and 4, E½, and E½SW¼;
Secs. 32 to 35, inclusive;
Sec. 36, NE¼ and W½.
T. 2 N., R. 58 E.,
Sec. 2, lots 3 and 4, and S½NW¼;
Secs. 3 and 4;
Sec. 5, S½;
Sec. 7, lot 4, E½SW¼, and E½;
Sec. 8;
Sec. 9, NE¼ and W½;
Sec. 10, NW¼;
Sec. 13, SW¼ and S½SE¼;
Sec. 17, NE¼ and W½;
Sec. 18;
Sec. 19, lots 1 and 2, and E½NW¼;
Sec. 20, S½;
Sec. 21, S½;
Sec. 22, NE¼ and S½;
Secs. 23 and 24;
Sec. 25, N½;
Sec. 26, N½;
Secs. 27 to 30, inclusive;
Sec. 31, lots 1 and 2, NE¼, and E½NW¼;
Sec. 32, N½.
T. 3 N., R. 58 E.,
Sec. 24, SE¼;
Sec. 25;
Sec. 26, NE¼ and S½;
Sec. 33, SE¼;
Secs. 34 and 35;
Sec. 36, N½ and SW¼.
T. 2 N., R. 59 E.,
Sec. 2, lots 2, 3, and 4, and S½NW¼;
Sec. 3, lots 1 to 4, inclusive, S½NE¼, and S½NW¼;
Sec. 4;
Sec. 8, NE¼ and S½;
Sec. 9;
Sec. 16, N½ and SW¼;
Secs. 17, 18, and 19;
Sec. 20, NW¼.
T. 3 N., R. 59 E.,
Sec. 12, E½ and SW¼;
Sec. 13;
Sec. 14, SE¼;
Sec. 19, lots 3 and 4, NE¼, E½SW¼, and SE¼;
Sec. 20;
Sec. 21, S½SW¼ and SE¼;
Sec. 22, NE¼ and S½;
Secs. 23 to 28, inclusive;
Sec. 29, N½;
Sec. 30;
Sec. 33, SE¼;
Secs. 34, 35, and 36.
T. 2 N., R. 60 E., Unsurveyed
Sec. 1.
T. 3 N., R. 60 E., Unsurveyed
Secs. 5 to 8, inclusive, Secs. 18 to 22, inclusive, Secs. 25 to 31, inclusive, Secs. 34, 35, and 36.
T. 4 N., R. 60 E.,
Sec. 20, SE¼;
Sec. 21, S½;
Secs. 22, 23, and 24;
Sec. 25, N½;
Sec. 26, N½;
Sec. 27, E½NE¼ and W½;
Secs. 28 and 29;
Sec. 30, SE¼;

Sec. 31, lots 3 and 4, E½, and E½SW¼;
Sec. 32;
Sec. 33, NW¼.
T. 2 N., R. 61 E., Unsurveyed
Sec. 6.
T. 3 N., R. 61 E., Unsurveyed
Secs. 2, 3, 4, and Secs. 9 to 15, inclusive;
Sec. 22, SE¼;
Secs. 23 and 24;
Sec. 25 (excluding Weepah Spring Wilderness Area);
Secs. 26 to 33, inclusive.
Secs. 34, 35, and 36 (excluding Weepah Spring Wilderness Area).
T. 4 N., R. 61 E.,
Sec. 19, lots 2, 3, and 4, E½SW¼, and SE¼;
Sec. 20, SW¼;
Sec. 28, SW¼;
Secs. 29 and 30;
Sec. 31, NE¼;
Secs. 32 and 33;
Sec. 34, S½.
T. 1 N., R. 62 E., Unsurveyed
Sec. 1, E½;
Sec. 12, E½;
Sec. 13.
T. 2 N., R. 62 E., Unsurveyed
Secs. 1 to 4, inclusive;
Sec. 5, N½;
Secs. 10 to 14, inclusive;
Sec. 15, NE¼;
Secs. 24 and 25;
Sec. 36, E½.
T. 3 N., R. 62 E.,
Sec. 18, lots 2, 3, and 4, E½SW¼, and SE¼;
Sec. 19;
Sec. 20, W½ and SE¼;
Sec. 28, W½ and SE¼;
Secs. 29 and 30;
Sec. 31 (excluding Weepah Spring Wilderness Area);
Secs. 32, 33, and 34, inclusive;
Sec. 35, SW¼.
T 1 N., R. 63 E., Unsurveyed
Secs. 6, 7, 8, Secs. 17 to 21, inclusive, and Secs. 26 to 30, inclusive;
Secs. 32 and 35, inclusive.
T. 1 S., R. 63 E., Unsurveyed
Secs. 1, 2, 11, 12, and 13.
T. 2 N., R. 63 E.,
Sec. 7, lots 1 to 4, inclusive, E½NW¼, E½SW¼, and SE¼;
Secs. 18, 19, 30, and 31.
T. 1 S., R. 64 E.,
Sec. 7, lots 2, 3, and 4, E½NW¼, E½SW¼, and SE¼;
Sec. 15, SW¼;
Sec. 16, S½;
Secs. 17 and 18;
Sec. 19, NE¼ and E½NW¼;
Secs. 20 to 23, inclusive;
Sec. 24, NW¼ and S½;
Sec. 25;
Sec. 26, N½;
Sec. 27, N½.
T. 1 S., R. 65 E.,
Sec. 19, lots 3 and 4, E½SW¼, and SE¼;
Sec. 20, SW¼;
Sec. 27, W½ and SE¼;
Secs. 28, 29, and 30;
Sec. 32, N½;
Sec. 33, N½ and SE¼;
Sec. 34;
Sec. 35, NW¼ and S½.
T. 2 S., R. 65 E.,
Sec. 1, S½NW¼ and SW¼;
Sec. 2;
Sec. 3, lots 1, 2, and 3, S½NE¼, S½NW¼, and SE¼;
Secs. 11, 12, and 13;
Sec. 14, NE¼.
T. 2 S., R. 66 E., Unsurveyed
Secs. 1 to 5, inclusive, Secs. 7 to 14, inclusive, Secs. 16, 17, 18, 20, and 24;
Secs. 16 to 18, inclusive.
T. 2 S., R. 67 E.,
Sec. 7, E½SE¼;
Sec. 8, S½;
Sec. 9, SW¼;
Sec. 14, SW¼ and W½SE¼;
Sec. 15, NW¼ and S½;
Secs. 16 to 20, inclusive;
Sec. 21, N½ and SE¼;
Sec. 22;
Sec. 23, NE¼NE¼, W½NE¼, W½, and SE¼;
Sec. 24, NW¼SW¼, S½SW¼, and NW¼SE¼;
Sec. 25 NW¼NW¼;
Sec. 26, NE¼;
Sec. 29, NW¼;
Sec. 30, lots 1 and 2, NE¼, and E½NW¼;
Sec. 35, NW¼NE¼;
Sec. 36, W½NE¼, SE¼NE¼, E½NW¼, E½SW¼, SW¼SW¼, and SE¼.
T. 3 S., R. 67 E.,
Sec. 1;
Secs. 12 and 13;
Sec. 16, E½;
Sec. 20, SE¼;
Sec. 21, W½NE¼, SW¼, NW¼SE¼, and N½SW¼SE¼;
Sec. 23, E½;
Secs. 24 and 25;
Sec. 28, W½NW¼, S½SW¼, and SE¼;
Sec. 29, NE¼, SW¼, N½SE¼, and SE¼SE¼;
Sec. 32, E½NE¼, NW¼, W½SW¼, NE¼SW¼, and E½SE¼;
Sec. 33, lots 2 and 3, and NW¼;
Sec. 35, E½;
Sec. 36.
T. 4 S., R. 67 E.,
Sec. 1;
Sec. 2, lots 1 and 2, S½NE¼, and SE¼;
Sec. 4, lots 3 and 4, S½NW¼, and SW¼;
Sec. 5, lots 1 and 4, SE¼NE¼, SW¼NW¼, NW¼SW¼, NE¼SE¼, and S½SE¼;
Sec. 6, lot 1, S½NE¼, and SE¼;
Sec. 7, lot 5;
Sec. 8, S½SE¼;
Sec. 9, N½NW¼ and SW¼;
Sec. 12, NE¼, N½NW¼, SE¼NW¼, and SE¼.
T. 2 S., R. 68 E.,
Sec. 23, S½;
Secs. 25 to 29, inclusive;
Sec. 30, E½, SE¼NW¼, and E½SW¼;
Sec. 31, NE¼ and E½NW¼;
Sec. 32, N½;
Sec. 33, N½;
Sec. 34, N½;
Sec. 35, N½;
Sec. 36.
T. 3 S., R. 68 E.,
Sec. 1;
Sec. 12, NE¼;
Sec. 19, lots 3 and 4, and E½SW¼;
Sec. 30, lots 1 to 4, inclusive, E½NW¼, and E½SW¼;
Sec. 31, lots 1 and 2, and E½NW¼.
T. 4 S., R. 68 E.,
Sec. 6, lots 5, 6, and 7, SE¼NW¼, E½SW¼, and SE¼;
Sec. 7, lots 2, 3, and 4, NE¼, E½SW¼, and SE¼;
Sec. 8, W½;
Sec. 17, NW¼;
Sec. 18, lot 1, NE¼, E½NW¼.
T. 2 S., R. 69 E.,
Sec. 30, lots 3 and 4, and E½SW¼;
Sec. 31, lots 1 to 4, inclusive, E½NW¼, E½SW¼, and SE¼;
Sec. 32, S½;
Sec. 33, S½.
T. 3 S., R. 69 E.,
Sec. 3, lot 4, S½NW¼, SW¼, and SE¼;
Secs. 4 to 7, inclusive;
Sec. 8, W½;
Sec. 9, E½ and NW¼;
Sec. 10;
Sec. 11, SW¼;
Sec. 13, S½;
Secs. 14 and 15;
Sec. 22, NE¼;
Secs. 23 and 24;
Sec. 25, N½.
T. 3 S., R. 70 E.,
Sec. 8, S½;
Sec. 9, S½;
Sec. 10, S½;
Sec. 11, S½;
Sec. 12, S½;
Secs. 13 to 17, inclusive;
Sec. 18; lots 8 to 12, inclusive, and E½;
Sec. 19; sec. 20, N½;
Sec. 22, NE¼;
Sec. 23, N½;
Sec. 24, NW¼.

2. This order does not authorize the construction, operation, or maintenance of a rail line to transport spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository.

3. All public lands included in this withdrawal will be managed in accordance with applicable Bureau of Land Management land use plans, laws, regulations, and policy. The actions of the Department of Energy in evaluation of the lands covered by this withdrawal will meet the Bureau of Land Management's definition of "casual use" as set forth at 43 CFR 2801.5. The withdrawal made by this order does not alter the applicability of those public land laws governing the use of the lands under lease, license, or permit, or governing the disposal of their mineral or vegetative resources other than under the mining laws.

4. This withdrawal will expire 10 years from the effective date of this order unless, as a result of a review conducted before the expiration date pursuant to section 204(f) of the Federal Land Policy and Management Act of 1976, 43 U.S.C. 1714(f) (2000), the Secretary determines that the withdrawal shall be extended.

(Authority: 43 U.S.C. 1714(a); 43 CFR 2310.3–3(b)(1))

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Dated: December 21, 2005.

Mark Limbaugh,

Assistant Secretary of the Interior.

[FR Doc. 05–24579 Filed 12–27–05; 8:45 am]

BILLING CODE 4310–HC–P

A.9 71 *FR* 60484, October 13, 2006

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DEPARTMENT OF ENERGY

Amended Notice of Intent To Expand the Scope of the Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, NV

AGENCY: Department of Energy.

ACTION: Amended notice of intent.

SUMMARY: The Department of Energy (DOE or the Department) is providing this Amended Notice of Intent to expand the scope of the ongoing Environmental Impact Statement for the Alignment, Construction and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, Nevada (DOE/EIS–0369, Rail Alignment EIS, Notice of Intent, April 8, 2004, 69 FR 18565). In the ongoing Rail Alignment EIS, DOE has undertaken an analysis of alternative rail alignments in which to construct and operate a rail line within what is referred to as the Caliente corridor. Based on new information, DOE now plans to expand the Rail Alignment EIS to incorporate analysis of a new rail corridor alternative. This additional analysis will supplement the corridor analyses in the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS–0250F, Yucca Mountain Final EIS, February 2002). The expanded analysis will consider the potential environmental impacts of a newly proposed Mina rail corridor at the same level of corridor analysis as is contained in the Yucca Mountain Final EIS, and will review the rail corridor analyses of that Final EIS, and update, as appropriate. The expanded scope will then proceed to include a detailed analysis of alternative alignments within the Mina corridor at the same level of analysis of the ongoing alignment analysis for the Caliente corridor. The result will be to provide the public with information concerning both the potential corridor and alignment impacts of the Mina corridor at the same time DOE presents the potential impacts for the construction and operation of a rail line within the Caliente corridor. The expanded EIS will be entitled the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS (DOE/EIS–0250F–S2 and DOE/EIS–0369).

On April 8, 2004 (69 FR 18557), the Department issued a Record of Decision announcing its selection, both nationally and in the State of Nevada, of the mostly rail scenario analyzed in the Yucca Mountain Final EIS. This decision will ultimately require the construction of a rail line to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada for the shipment of spent nuclear fuel and high-level radioactive waste. To that end, the Department also selected the Caliente rail corridor in which to examine possible alignments for construction of that rail line. On April 8, 2004 (69 FR 18565), DOE issued a Notice of Intent to prepare an EIS under the National Environmental Policy Act (NEPA) for the alignment, construction, and operation of a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials from a site near Caliente, Nevada, to a geologic repository at Yucca Mountain, Nevada (the Rail Alignment EIS).

During subsequent public scoping, DOE received comments that offered preferences for various rail corridors analyzed in detail in the Yucca Mountain Final EIS, and identified other rail corridors for consideration. In particular, commenters recommended that DOE consider the Mina route, which would include use of an existing rail line from Hazen, Nevada, to the Thorne siding in Hawthorne, Nevada, and the construction of new rail line that would follow an abandoned rail line nearly to Yucca Mountain.

In the Yucca Mountain Final EIS, DOE considered, but eliminated from detailed study, several potential rail routes. One of those potential rail routes, the Mina route, could only connect to an existing rail line by crossing the Walker River Paiute Tribe Reservation northwest of Hawthorne, Nevada, and the Tribe had informed DOE that it would refuse to allow nuclear waste to be transported across its reservation (letter dated December 6, 1991). For this reason, the Department considered the Mina route to pose an unavoidable land use conflict and thus to be unavailable for further consideration.

Following review of the scoping comments for the Rail Alignment EIS, DOE held discussions with the Walker River Paiute Tribe regarding the availability of the Mina route. Subsequently, in May 2006, the Walker River Paiute Tribe informed DOE that the Tribal Council had withdrawn its objection to the completion of an EIS studying the transportation of nuclear waste across its reservation. The Tribe stated that its Tribal Council had not decided to allow such shipments, but indicated that inclusion of the Mina route in an EIS would allow the Tribe to make a more informed, final decision about the matter.

In view of the Tribal Council's decision, DOE initiated a study to determine the feasibility of the Mina route, and to identify a specific corridor (Mina corridor) and associated preliminary alternative alignments (described below under Mina Alternative Alignments). Based on DOE's preliminary analysis, in comparison with other rail corridors, the Mina corridor appears to offer potential advantages to the extent it would cross fewer mountain ranges, utilize existing rail bed, and also be a shorter distance. These potential advantages would simplify design and construction of a rail line, and therefore would be less costly to construct. The Mina corridor also would appear to have fewer land use conflicts, and would involve less land disturbance, which tends to result in lower adverse environmental impacts overall.

For these reasons, DOE has concluded that the Mina corridor warrants further detailed study. Accordingly, DOE is announcing its intent to expand the scope of the Rail Alignment EIS to supplement the rail corridor analyses of the Yucca Mountain Final EIS, and analyze the Mina corridor. This Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS [1] also will consider, in detail, alignments for the construction and operation of a rail line within the Caliente and Mina rail corridors.

DATES: The Department invites comments on the scope of the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS to ensure that all relevant environmental issues and reasonable alternatives are addressed. Public scoping meetings are discussed below in the **SUPPLEMENTARY INFORMATION** section. DOE will consider all comments received during the 45-day public scoping period, which starts with publication of this Amended Notice of Intent and ends November 27, 2006. Comments received after this date will be considered to the extent practicable.

ADDRESSES: Requests for additional information on the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS or transportation planning in general should be directed to: Mr. M. Lee Bishop, EIS Document Manager, Office of Logistics Management, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 011, Las Vegas, NV 89134, Telephone 1–800–967–3477. Written comments on the scope of the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS may be submitted to Mr. M. Lee Bishop at this address, by facsimile to 1–800–967–0739, or via the Internet at *http://www.ocrwm.doe.gov* under the caption, What's New.

FOR FURTHER INFORMATION CONTACT: For general information regarding the DOE NEPA process contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance, U.S. Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585. Telephone 202–586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

On July 23, 2002, the President signed into law (Pub. L. 107–200) a joint resolution of the U.S. House of Representatives and the U.S. Senate designating the Yucca Mountain site in Nye County, Nevada, for development as a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste. Subsequently, the Department issued a Record of Decision (April 8, 2004) to announce its selection, both nationally and in the State of Nevada, of the mostly rail scenario analyzed in the Yucca Mountain Final EIS as the mode of transportation for spent nuclear fuel and high-level radioactive waste to the repository. Under the mostly rail scenario, the Department would rely on a combination of rail, truck and possibly barge to transport to the repository site at Yucca Mountain up to 70,000 metric tons of heavy metal of spent nuclear fuel and high-level radioactive waste. Most of the spent nuclear fuel and high-level radioactive waste, however, would be transported by rail.

The Department's decision to select the mostly rail scenario in Nevada ultimately will require the construction of a rail line [2] to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada for the shipment of spent nuclear fuel and high-level radioactive waste in the event the Nuclear Regulatory Commission authorizes construction of the repository, and receipt and possession of these materials at Yucca Mountain. To that end, in the same Record of Decision, the Department also decided to select the Caliente rail corridor [3] to study possible alignments for this proposed rail line. The Caliente rail corridor originates at an existing siding to the Union Pacific railroad near Caliente, Nevada, and extends in a westerly direction to the northwest corner of the Nevada Test and Training Range, before turning south-southeast to the repository at Yucca Mountain. The Caliente corridor ranges between 512 kilometers (318 miles) and 553 kilometers (344 miles) in length, depending on the alternative alignments considered.

On April 8, 2004, DOE issued a Notice of Intent to prepare an EIS under NEPA for the alignment, construction, and operation of a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials [4] from a site near Caliente, Nevada to a geologic repository at Yucca Mountain, Nevada. During subsequent public scoping, DOE received comments that offered preferences for various rail corridors analyzed in detail in the Yucca Mountain Final EIS, and identified other rail corridors for consideration. In particular, commenters recommended that DOE consider "the Mina route," which would include use of an existing rail line from Hazen, Nevada, to the Thorne siding at Hawthorne, Nevada, and the construction of new rail line that would follow an abandoned rail line nearly to Yucca Mountain.

In the Yucca Mountain Final EIS, DOE considered, but eliminated from detailed study, the Mina route and several other potential rail routes (see Section 2.3.3.1). These other potential rail routes were identified in a series of three transportation studies—"Preliminary Rail Access Study" (January, 1990), the "Nevada Potential Repository Preliminary Transportation Strategy, Study 1" (February, 1995), and the "Nevada Potential Repository Preliminary Transportation Strategy, Study 2" (February, 1996). Based on the latter (1996) study and public scoping, five potential rail corridors were considered in detail in the Yucca Mountain Final EIS.

In the 1996 study, the Mina route was not recommended for further study, because a rail line within the Mina route could only connect to an existing rail line by crossing the Walker River Paiute

[1] Coincident with this Amended Notice of Intent, DOE is publishing a Notice of Intent to prepare a Supplemental Yucca Mountain EIS (DOE/EIS–0250F–S1). That Supplement will consider the current repository design and plans for its construction and operation, and the transportation of spent nuclear fuel and high-level radioactive waste from sites around the United States to the repository at Yucca Mountain.

[2] Rail line means the railroad track and underlying earthworks.

[3] A corridor is a strip of land 400 meters (0.25 mile) wide through which DOE would identify an alignment for the construction of a rail line.

[4] Other materials are those related to the construction and operation of the repository.

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Tribe Reservation, and the Tribe had informed DOE that it would refuse to allow nuclear waste to be transported across its reservation (letter dated December 6, 1991). For this reason, the Department considered the Mina route to pose an unavoidable land use conflict and thus to be unavailable for further consideration (see Section 2.3.3.1 in the Yucca Mountain Final EIS).

Following review of the scoping comments for the Rail Alignment EIS, DOE held discussions with the Walker River Paiute Tribe regarding the availability of the Mina route. Subsequently, in May 2006, the Walker River Paiute Tribe informed DOE that the Tribal Council had withdrawn its objection to the completion of an EIS studying the transportation of nuclear waste across its reservation. The Tribe stated that its Tribal Council had not decided to allow such shipments, but indicated that inclusion of the Mina route in an EIS would allow the Tribe to make a more informed, final decision about the matter.

In view of the Tribal Council's decision, DOE initiated a study to determine the feasibility of the Mina route, and to identify a specific corridor (the Mina corridor) and associated preliminary alternative alignments. Based on DOE's preliminary analysis, in comparison with other rail corridors, the Mina corridor appears to offer potential advantages to the extent it would cross fewer mountain ranges, utilize existing rail bed, and also be a shorter distance. These potential advantages would simplify design and construction of the rail line, and therefore would be less costly to construct. The Mina corridor also would appear to have fewer land use conflicts, and would involve less land disturbance, which tends to result in lower adverse environmental impacts overall.

For these reasons, DOE has concluded that the Mina corridor warrants further detailed study. Accordingly, DOE is announcing its intent to expand the scope of the Rail Alignment EIS to prepare a Supplemental EIS that will supplement the rail corridor analyses of the Yucca Mountain Final EIS. In the Yucca Mountain Final EIS, DOE evaluated the construction and operation of a rail line within five corridors—Caliente, Caliente-Chalk Mountain, Carlin, Jean and Valley Modified. In the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS, DOE will review the environmental information and analyses for these corridors, and update, as appropriate[5]; DOE also plans to consider the Mina corridor at a level of detail commensurate with that of the Yucca Mountain Final EIS. In addition, the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS will consider, in detail, alignments for the construction and operation of a rail line within the Caliente and Mina corridors.

The Mina corridor originates at an existing rail line near Wabuska, Nevada, where it proceeds southeasterly through Hawthorne to Blair Junction, and then on to Lida Junction. At that point, it becomes coincident with the Caliente corridor trending southeasterly through Oasis Valley before turning north-northeast to Yucca Mountain. The Mina corridor is about 450 kilometers (280 miles) in length; however, construction of new rail line would range between about 386 kilometers (240 miles) and 409 kilometers (254 miles) because the corridor includes the existing Department of Defense rail line from Wabuska to the Hawthorne Army Depot in Hawthorne.

Previous Public Scoping Comments

The Department received more than 4,100 comments during the public scoping period for the Rail Alignment EIS that ended June 1, 2004. In general, many of these comments offered preferences for various rail corridors or requested DOE to evaluate rail corridors other than Caliente, and suggested new alternative alignments or criteria (*e.g.*, avoid wilderness study areas) that could be used to modify the preliminary alignments proposed by DOE or to create new alternative alignments. These comments helped inform DOE's decision to expand the scope of the Rail Alignment EIS as discussed under Background above, and to identify the range of reasonable alternative alignments as discussed under Caliente Alternative Alignments below.

Commenters also requested that DOE allow other commodities to be shipped on the rail line by private entities (referred to herein as shared use). As described under Proposed Action below, the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS will evaluate shipments of commercial commodities, in addition to shipments of DOE materials.

DOE also received comments regarding analytical methods for various environmental resources such as cultural resources and water use, treatment of cumulative impacts and Native American concerns, the nature of the evaluation of potential accidents and sabotage, and the identification of mitigation measures. These comments and associated issues will be addressed in the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS.

Proposed Action

Under the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS, the Proposed Action is to determine a rail alignment[6] (within a rail corridor) in which to construct and operate a rail line for shipments of spent nuclear fuel, high-level radioactive waste, and other materials from an existing railroad in Nevada to a geologic repository at Yucca Mountain, Nye County, Nevada. DOE now plans to review the environmental information and analyses for four rail corridors, and update, as appropriate (Caliente, Carlin, Jean and Valley Modified), include and analyze the Mina corridor, and evaluate in detail two alternatives that would implement the Proposed Action—the Mina Alternative and the Caliente Alternative. Under each implementing alternative, DOE will evaluate the potential environmental impacts from the construction and operation of a rail line along various alternative alignments[7] and common segments.[8] As part of rail line operations, DOE also will evaluate, as an option to the Mina and Caliente implementing alternatives, the shipment of commercial commodities by private entities (shared use).

Preliminary Alternatives

As required by the Council on Environmental Quality and Departmental regulations that implement NEPA, the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS will analyze and present the environmental impacts associated with the range of reasonable alternatives to meet DOE's purpose and need for a rail line, and a no-action alternative. The preliminary alternative alignments for the Caliente and Mina rail alignments comprise a series of common segments and alternatives (maps may be obtained as described above in

[5] In a letter to the U.S. Air Force (dated December 1, 2004), DOE eliminated from detailed study alignments that would intersect the Nevada Test and Training Range because of concerns regarding military readiness testing and training activities. This letter was in response to a May 28, 2004 letter from the U.S. Air Force. For the same reasons cited in these letters, DOE does not intend to consider further the Caliente-Chalk Mountain rail corridor.

[6] A strip of land less than 400 meters (0.25 mile) wide through which the location of a rail line would be identified.

[7] A geographic region of the rail alignment for which multiple routes for the rail line have been identified.

[8] A geographic region of the rail alignment for which a single route for the rail line has been identified.

ADDRESSES). The Department is interested in identifying and subsequently evaluating any additional reasonable alternative alignments within the Caliente or Mina corridors that would reduce or avoid known or potential adverse environmental impacts, features having aesthetic values, and land-use conflicts, or alternatives that should be eliminated from detailed consideration. This could include identifying alternative alignments that could avoid environmentally sensitive areas or other land use conflicts.

Caliente Alternative Alignments

DOE's Notice of Intent (April 8, 2004) identified preliminary alternative alignments and common segments to be evaluated in the Rail Alignment EIS. The Notice of Intent also indicated that DOE would consider other potential alternatives if they would minimize, avoid or otherwise mitigate adverse environmental impacts.

Following scoping, DOE evaluated all public comments, as well as information from other sources, that could affect the preliminary alternative alignments and common segments identified in the Notice of Intent. Based on this information, DOE identified additional alternative alignments, and modified the preliminary alignments and common segments identified in the Notice of Intent to create a suite of potential alternatives. This suite was then evaluated using environmental features and engineering and design factors to determine, preliminarily, the range of reasonable alternative alignments. As an example, commenters identified alternative alignments that would avoid Garden Valley by identifying routes through Coal Valley that cross the Golden Gate Range. However, DOE found these alignments are not reasonable alternatives because they would either exceed engineering and design factors or would be far more costly to construct than other alignments that pass through Garden Valley.

On this basis, DOE has identified, preliminarily, alternative alignments at the interface with the Union Pacific Railroad near Caliente, in Garden Valley, near the Reveille Range and the Town of Goldfield, north of Scottys Junction (referred to as Bonnie Claire), and in Oasis Valley. These alternative alignments, which are described below, will be considered in detail in the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS.

Interface With Union Pacific Railroad

DOE has identified two alternative alignments, Caliente and Eccles, either of which alternative alignment would connect the proposed rail line to the existing Union Pacific Railroad in or near the City of Caliente. The Caliente alternative alignment would begin in Caliente, enter Meadow Valley Wash at Indian Cove, and extend generally north through Meadow Valley Wash and along U.S. 93. This alternative alignment would then cross U.S. 93 about 5 kilometers (3 miles) southwest of Panaca and connect to Common Segment 1 about 1 kilometer (0.6 mile) northwest of U.S. 93 and 18 kilometers (11 miles) south of Pioche. The Caliente alternative alignment would be approximately 18 kilometers (11 miles) long.

The Eccles alternative alignment would begin along Clover Creek about 8 kilometers (5 miles) east of Caliente and trend generally north to enter Meadow Valley Wash from the southeast. This alternative alignment would then cross U.S. 93 about 5 kilometers (3 miles) southwest of Panaca and connect to Common Segment 1 about 1 kilometer (0.6 mile) northwest of U.S. 93 and 18 kilometers (11 miles) south of Pioche. The Eccles alternative alignment would be about 18 kilometers (11 miles) long.

Garden Valley

DOE is considering four alternative alignments in the Garden Valley area, referred to as Garden Valley 1, 2, 3, and 8. Garden Valley 1 would run due west through the Golden Gate Range for about 7 kilometers (4 miles), trend in a southwesterly direction through Garden Valley, cross the Lincoln and Nye County line, and connect to Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area, and 3 kilometers (2 miles) east of the Humboldt Toiyabe National Forest. The Garden Valley 1 alternative alignment would be approximately 35 kilometers (22 miles) long.

Garden Valley 2 would run to the south of Garden Valley 1 and Garden Valley 3, crossing the Lincoln and Nye County line. Garden Valley 2 would continue southwesterly through the Golden Gate Range at Water Gap, turn westward through Garden Valley, and continue southwesterly to connect to Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area and 3 kilometers (2 miles) east of the Humboldt Toiyabe National Forest. The Garden Valley 2 alternative alignment would be about 37 kilometers (23 miles) long.

Garden Valley 3 would run due west through the Golden Gate Range and then in a northwesterly direction until turning southwest to run along the southeast base of the Quinn Canyon Range. Continuing in a southwesterly direction, it would run through Garden Valley, cross the Lincoln and Nye County line, and connect to Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area and 3 kilometers (2 miles) east of the Humboldt Toiyabe National Forest. The Garden Valley 3 alternative alignment would be approximately 36 kilometers (22 miles) long.

Garden Valley 8 would run to the south of Garden Valley 1 and Garden Valley 3, crossing the Lincoln and Nye County line. It would continue southwesterly through the Golden Gate Range at Water Gap, would turn westward through Garden Valley, and run in a southwesterly direction before turning sharply westward. Garden Valley 8 would proceed westward and connect to Common Segment 2 about 5 kilometers (3 miles) north of the Worthington Mountains Wilderness Area and 3 kilometers (2 miles) east of the Humboldt Toiyabe National Forest. The Garden Valley 8 alternative alignment would be about 38 kilometers (23 miles) long, 8 kilometers (5 miles) of which parallels Garden Valley Road.

South Reveille

South Reveille 2 and South Reveille 3 alternative alignments would begin 5 kilometers (3 miles) south of the South Reveille Wilderness Study Area. South Reveille 2 would trend to the northwest along the border of the South Reveille Wilderness Study Area. South Reveille 3 would trend northwest a few kilometers to the west and roughly parallel to South Reveille 2. South Reveille 2 or South Reveille 3 would connect to Common Segment 3 in Reveille Valley about 14 kilometers (9 miles) west of State Route 375. South Reveille 2 would be approximately 19 kilometers (12 miles) long and South Reveille 3 would be approximately 20 kilometers (12 miles) long.

Goldfield

DOE is considering three alternative alignments in the Goldfield area, referred to as Goldfield 1, 3, and 4. Goldfield 1 would extend south into the Goldfield Hills area, passing east of Black Butte. It would turn east near Espina Hill and head south to the east of Blackcap Mountain. It would wind around a series of hills and valleys to maintain an acceptable grade. Goldfield 1 would run for approximately 11 kilometers (7 miles) along an abandoned rail line before joining Common Segment 4 about 1 kilometer (0.6 mile) northeast of Ralston. In total, the Goldfield 1 alternative alignment would be 47 kilometers (29 miles) long.

Goldfield 3 would extend south and farther to the east than the other Goldfield alternative alignments. Like Goldfield 1, Goldfield 3 would wind around a series of hills and valleys to maintain an acceptable grade. Also like Goldfield 1, Goldfield 3 would run for approximately 11 kilometers (7 miles) along an abandoned rail line before joining common Segment 4 about 1 kilometer (0.6 mile) northeast of Ralston. In total, the Goldfield 3 alternative alignment would be about 50 kilometers (31 miles) long.

The western Goldfield alternative alignment, Goldfield 4, would depart from Common Segment 3 to the north of Black Butte and trend southwest. It would then cross U.S. 95 and turn south toward Goldfield. After passing through the southwestern edge of Goldfield and crossing U.S. 95 again, Goldfield 4 would turn south to connect with Common Segment 4. Goldfield 4 would be about 53 kilometers (33 miles) long.

Bonnie Claire

DOE is considering two alternative alignments, Bonnie Claire 2 and 3. Bonnie Claire 2 would depart Common Segment 4 about 8 kilometers (5 miles) north of Stonewall Pass and would trend east toward the Nevada Test and Training Range for about 5 kilometers (3 miles) before turning south for an additional 17 kilometers (11 miles). Bonnie Claire 2 generally would follow the Nevada Test and Training Range boundary and would join Common Segment 5 in Sarcobatus Flats to the north of Scottys Junction near the intersection of State Route 267 and U.S. 95. Bonnie Claire 2 would be approximately 20 kilometers long.

Bonnie Claire 3 would depart Common Segment 4 about 8 kilometers (5 miles) north of Stonewall Pass. Bonnie Claire 3 would trend generally south, paralleling U.S. 95 to the east. After approximately 10 kilometers (6 miles), Bonnie Claire 3 would turn southeast and continue for an additional 10 kilometers (6 miles) through Sarcobatus Flats. It would then join Common Segment 5 approximately 4 kilometers (2 miles) north of Scottys Junction near the intersection of State Route 267 and U.S. 95. Bonnie Claire 3 would be approximately 20 kilometers (12 miles) long.

Oasis Valley

DOE is considering two alternative alignments, referred to as Oasis Valley 1 and Oasis Valley 3. Oasis Valley 1 would depart Common Segment 5 about 3 kilometers (2 miles) north of Oasis Mountain and would run southeast and connect to Common Segment 6. Oasis Valley 1 would be approximately 10 kilometers (6 miles) long.

Oasis Valley 3 would also depart Common Segment 5 about 3 kilometers (2 miles) north of Oasis Mountain and would run generally east and then south before crossing Oasis Valley farther to the east than Oasis Valley 1, and then connecting to Common Segment 6. Oasis Valley 3 would be 14 kilometers (9 miles) long.

Mina Alternative Alignments

Following receipt of the letter regarding the Walker River Paiute Tribal Council decision (May, 2006), the Department initiated a study to consider the feasibility of the Mina route, and to identify a specific corridor (Mina corridor) and associated preliminary alternative alignments. The process used to identify the preliminary alternative alignments within the Mina corridor is consistent with that described under Caliente Alternative Alignments. Alternative alignments were identified near the Town of Schurz, around the Montezuma Range, north of Scottys Junction (referred to as Bonnie Claire), and in Oasis Valley. These are described below.

Town of Schurz

DOE has identified three alternative alignments that would bypass the Town of Schurz, Nevada. Schurz Bypass 1 would depart from the existing rail line about 30 kilometers (18 miles) northwest of the Town of Schurz passing along the eastern side of the valley (Sunshine Flat). From there, the alignment passes east of Weber Reservoir and crosses U.S. 95 about 8 kilometers (5 miles) north of the intersection of U.S. 95 and Alternate U.S. 95. Schurz Bypass 1 then trends southeast remaining on the far side of the valley to where it rejoins the existing rail line about 13 kilometers (8 miles) south of Schurz. Schurz Bypass 1 would be 51 kilometers (32 miles) long.

Schurz Bypass 2 also would depart the existing line at the same point of departure as Schurz Bypass 1 and would pass along the eastern side of Sunshine Flat. From there, the alignment passes east of Weber Reservoir and crosses U.S. 95 about 7 kilometers (4 miles) north of the intersection of U.S. 95 and Alternate U.S. 95. From there, the alignment trends to the southeast but staying to the east of Schurz and west of Schurz Bypass 1 until it rejoins the existing rail line about 13 kilometers (8 miles) south of Schurz. Schurz Bypass 2 would be 50 kilometers (31 miles) long.

Schurz Bypass 3 would depart the existing rail line about 9 kilometers (6 miles) northwest of the Town of Schurz where it would cross the Walker River. The alignment then crosses U.S. 95 about 8 kilometers (5 miles) north of the intersection of U.S. 95 and Alternate U.S. 95 at which point it continues southeasterly to a point where it rejoins the existing rail line about 13 kilometers (8 miles) south of Schurz, on the east side of the valley.

Montezuma Range

DOE identified two alternative alignments that depart near Blair Junction at the intersection of U.S. 95 and U.S. 6 to avoid the Montezuma Range; they rejoin at a point just east of Lida Junction. The first alignment, Montezuma Range 1, would depart Blair Junction paralleling State Route 265 to the Town of Silver Peak where it would proceed north to follow the western side of Clayton Ridge. The alignment would then turn south approximately 16 kilometers (10 miles) before Railroad Pass at which point it would turn east between the southern end of the Goldfield Hills and the Cuprite Hills. The alignment would then cross U.S. 95 about 7 kilometers (5 miles) north of Lida Junction and, paralleling U.S. 95, then head south to a point just east of Lida Junction. Montezuma Range 1 would be about 134 kilometers (83 miles) long.

Montezuma Range 2, after departing from the intersection of U.S. 95 and U.S. 6, would follow the abandoned Tonopah and Goldfield rail roadbed east to the north of Lone Mountain, at which point the alignment would head south following the abandoned roadbed. The alignment would traverse Montezuma Valley south to Klondike and would then parallel U.S. 95 as it approaches the Town of Goldfield. Montezuma Range 2 would stay west of Goldfield and then trend southeasterly to a point just east of Lida Junction where it would reconnect with Montezuma Range 1. Montezuma Range 2 would be about 135 kilometers (84 miles) long.

Bonnie Claire and Oasis Valley

The Bonnie Claire and Oasis Valley alternative alignments are as described above under Caliente Alternative Alignments.

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No Action Alternative

The Council on Environmental Quality and Departmental regulations that implement NEPA require consideration of the alternative of no action. Under the No Action Alternative, DOE would not select a rail alignment within the Caliente or Mina rail corridors for the construction and operation of a rail line. As such, the No Action Alternative provides a basis for comparison to the Proposed Action.

In the event that DOE were not to select a rail alignment in the Caliente or Mina corridors, the future course that it would pursue is uncertain. DOE recognizes that other possibilities could be pursued, including identifying and evaluating alignments in other corridors considered in the Yucca Mountain Final EIS.

Potential Environmental Issues and Resources To be Examined

The Council on Environmental Quality regulations direct Federal agencies preparing an EIS to focus on significant environmental issues (40 CFR 1502.1) and discuss impacts in proportion to their significance (40 CFR 1502.2). Accordingly, the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS will analyze issues and impacts with the amount of detail commensurate with their importance.

To facilitate the scoping process, DOE has identified a preliminary list of issues and environmental resources that it may consider in the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS. The list is not intended to be all-inclusive or to predetermine the scope or alternatives of the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS, but should be used as a starting point from which the public can help DOE define the scope of the EIS.

- Potential impacts to the concept of multiple use as it applies to public land use planning and management specified by the Federal Land Policy and Management Act of 1976.
- Potential impacts to land use and ownership.
- Potential impacts to plants, animals and their habitats, including impacts to wetlands, and threatened and endangered and other sensitive species.
- Potential impacts to cultural resources.
- Potential impacts to American Indian resources.
- Potential impacts to paleontological resources.
- Potential impacts to the public from noise and vibration.
- Potential impacts to the general public and workers from radiological exposures during incident-free operations of the railroad.
- Potential impacts to the general public and workers from radiological exposures from potential accidents during operations of the railroad.
- Potential impacts to water resources and floodplains.
- Potential impacts to aesthetic values.
- Potential disproportionately high and adverse impacts to low-income and minority populations (environmental justice).
- Irretrievable and irreversible commitment of resources.
- Compliance with applicable Federal, state and local requirements.

The Department specifically invites comments on the following relative to the Mina corridor and its alternative alignments:

1. Should additional alternative alignments be considered that might minimize, avoid or mitigate adverse environmental impacts (for example, looking beyond the 0.25 mile wide Mina corridor, avoiding environmentally sensitive areas)?
2. Should any of the preliminary alternatives be eliminated from detailed consideration?
3. Should additional environmental resources be considered?
4. What mitigation measures should be considered?

In addition, the Department is interested in identifying any significant changes to, or new information relevant to, the rail corridors analyzed in the Yucca Mountain Final EIS.

Schedule

The DOE intends to issue the Draft Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS in 2007 at which time its availability will be announced in the **Federal Register** and local media. A public comment period will start upon publication of the Environmental Protection Agency's Notice of Availability in the **Federal Register**. The Department will consider and respond to comments received on the Draft in preparing the Final Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS.

Other Agency Involvement

Currently, the U.S. Bureau of Land Management, U.S. Air Force and the U.S. Surface Transportation Board are cooperating agencies in the preparation of the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS. The Department also expects to invite the following to be cooperating agencies: Walker River Paiute Tribe, U.S. Bureau of Indian Affairs, and the U.S. Army. The Tribe and these agencies have management and regulatory authority over lands traversed by alternative rail alignments within the Mina and Caliente rail corridors, or special expertise germane to the construction and operation of a rail line. DOE will consult with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Nuclear Regulatory Commission, Native American Tribal organizations, the State of Nevada, and Nye, Lincoln, Esmeralda, Mineral, Churchill and Lyon Counties regarding the environmental and regulatory issues germane to the Proposed Action. DOE invites comments on its identification of cooperating and consulting agencies and organizations.

Public Scoping Meetings

DOE will hold public scoping meetings on the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS. The meetings will be held at the following locations and times:

- Amargosa Valley, Nevada. Longstreet Hotel Casino, Nevada State Highway 373, November 1, 2006 from 4–7 p.m.[9]
- Caliente, Nevada. Caliente Youth Center, U.S. 93 North, November 8, 2006 from 6–8 p.m.
- Goldfield, Nevada. Goldfield School Gymnasium, Hall and Euclid, November 13, 2006 from 4–7 p.m.
- Hawthorne, Nevada. Hawthorne Convention Center, 932 E. Street, November 14, 2006 from 4–7 p.m.
- Fallon, Nevada. Fallon Convention Center, 100 Campus Way, November 15, 2006 from 4–7 p.m.

The public scoping meetings will be an open meeting format without a formal presentation by DOE. Members of the public are invited to attend the meetings at their convenience any time during meeting hours and submit their comments in writing at the meeting, or in person to a court reporter who will be available throughout the meeting. This open meeting format increases the opportunity for public comment and provides for one-on-one discussions with DOE representatives involved with

[9] DOE will hold a joint public scoping meeting on the Supplemental Yucca Mountain EIS (DOE/EIS–0250F–S1) and Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS (DOE/EIS–0250F–S2 and DOE/EIS–0369) in Amargosa Valley, Longstreet Hotel Casino, Nevada State Highway 373, November 1 from 4–7 pm. Additional public scoping meetings on the Supplemental Yucca Mountain EIS will be held in Washington, DC, L'Enfant Plaza Hotel, 480 L'Enfant Plaza, SW, October 30 from 4–7 pm; and Las Vegas, Cashman Center, 850 North Las Vegas Blvd., November 2 from 4–7 pm.

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the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS, and transportation planning in general.

The public scoping meetings will be held during the public scoping comment period. The comment period begins with publication of this Amended Notice of Intent in the **Federal Register** and closes November 27, 2006. Comments received after this date will be considered to the extent practicable. Written comments may be provided in writing, facsimile, or by the Internet to Mr. Lee Bishop, EIS Document Manager (see **ADDRESSES** above).

Public Reading Rooms

Documents referenced in this Amended Notice of Intent and related information are available at the following locations: Beatty Yucca Mountain Information Center, 100 North E. Avenue, Beatty, NV 89003, (775) 553–2130; Esmeralda County Yucca Mountain Oversight Office, 274 E. Crook Avenue, Goldfield, NV 89013, (775) 485–3419; Las Vegas Yucca Mountain Information Center, 4101–B Meadows Lane, Las Vegas, NV 89107, (702) 295–1312; Lincoln County Nuclear Waste Project Office, 100 Depot Avenue, Caliente, NV 89008, (775) 726–3511; Nye County Department of Natural Resources and Federal Facilities, 1210 E. Basin Road, Suite #6, Pahrump, NV 89060 (775) 727–7727; Pahrump Yucca Mountain Information Center, 2341 Postal Drive, Pahrump, NV 89048, (775) 571–5817; University of Nevada, Reno, The University of Nevada Libraries, Business and Government Information Center, M/S 322, 1664 N. Virginia Street, Reno, NV 89557, (775) 784–6500, Ext. 309; and the U.S. Department of Energy Headquarters Office Public Reading Room, 1000 Independence Avenue SW., Room 1E–190 (ME–74) FORS, Washington, DC 20585, 202–586–3142.

Issued in Washington, DC, October 10, 2006.

David R. Hill,

General Counsel.

[FR Doc. 06–8675 Filed 10–10–06; 4:15 pm]

BILLING CODE 6450–01–P

A.10 71 *FR* 60490, October 13, 2006

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DEPARTMENT OF ENERGY

Supplement to the Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV

AGENCY: U.S. Department of Energy.

ACTION: Notice of intent.

SUMMARY: The U.S. Department of Energy (DOE or the Department) is announcing its intent to prepare a Supplement to the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS-0250F, February 2002) (Yucca Mountain Final EIS). The Proposed Action addressed in the Yucca Mountain Final EIS is to construct, operate and monitor, and eventually close a geologic repository at Yucca Mountain in southern Nevada for the disposal of spent nuclear fuel and high-level radioactive waste.

The Yucca Mountain Final EIS considered the potential environmental impacts of a repository design for surface and subsurface facilities, a range of canister packaging scenarios and repository thermal operating modes, and plans for the construction, operation and monitoring, and eventual closure of the repository. The Yucca Mountain Final EIS also considered the environmental impacts of the transportation of spent nuclear fuel and high-level radioactive waste from commercial and DOE sites to the repository by two principal modes—mostly truck and mostly rail. In the Yucca Mountain Final EIS DOE recognized that these repository design concepts and operational plans would continue to develop during the design and engineering process.

Since publication of the Yucca Mountain Final EIS, DOE has continued to develop the repository design and associated plans. As now planned, the proposed surface and subsurface facilities would allow DOE to operate the repository following a primarily canistered approach in which most commercial spent nuclear fuel would be packaged at the commercial sites in multipurpose transport, aging and disposal canisters (TADs), and all DOE materials would be packaged in disposable canisters at the DOE sites. Waste packages would be arrayed in the repository underground to achieve what is referred to as a higher-thermal operating mode, and most spent nuclear fuel and high-level radioactive waste would arrive at the repository by rail.

To evaluate the potential environmental impacts of the current repository design and operational plans, DOE has decided to prepare a Supplement to the Yucca Mountain Final EIS [1], consistent with the National Environmental Policy Act (NEPA) and the Nuclear Waste Policy Act, as amended (Pub. L. 97–425) (NWPA). This Supplemental Yucca Mountain EIS (DOE/EIS–0250–S1) is being prepared to assist the U.S. Nuclear Regulatory Commission (NRC) in satisfying its NEPA responsibilities pursuant to the NWPA (Section 114(f)(4)) [2].

DATES: The Department invites comments on the scope of the Supplemental Yucca Mountain EIS to ensure that all relevant environmental issues are addressed. Public scoping meetings are discussed below in the **SUPPLEMENTARY INFORMATION** section. DOE will consider all comments received during the 45-day public scoping period, which starts with publication of this Notice of Intent and ends November 27, 2006. Comments received after this date will be considered to the extent practicable.

ADDRESSES: Requests for additional information on the Supplemental Yucca Mountain EIS or on the repository program in general, should be directed to: Dr. Jane Summerson, EIS Document Manager, Regulatory Authority Office, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, 1551 Hillshire Drive, M/S 010, Las Vegas, NV 89134, Telephone 1–800–967–3477. Written comments on the scope of the Supplemental Yucca Mountain EIS may be submitted to Dr. Jane Summerson at this address, or by facsimile to 1–800–967–0739, or via the Internet at *http://www.ocrwm.doe.gov* under the caption What's New.

FOR FURTHER INFORMATION CONTACT: For general information regarding the DOE NEPA process contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance, U.S. Department of Energy, 1000 Independence Ave., SW., Washington, DC 20585, Telephone 202–586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

[1] Coincident with this Notice of Intent, DOE is publishing an Amended Notice of Intent to prepare a Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS (DOE/EIS–0250F–S2 and DOE/EIS–0369). That EIS will review the rail corridor analyses of the Yucca Mountain Final EIS, and update, as appropriate, and will analyze the proposed Mina corridor; it also will include detailed analyses of alternative alignments for the construction and operation of a rail line within the Mina corridor, as well as the Caliente corridor.

[2] Section 114(f)(4) of the NWPA provides that any environmental impact statement "prepared in connection with a repository * * * shall, to the extent practicable, be adopted by the Commission [NRC] in connection with the issuance by the Commission of a construction authorization and license for such repository. To the extent such statement is adopted by the Commission, such adoption shall be deemed to also satisfy the responsibilities of the Commission under the National Environmental Policy Act of 1969 * * *."

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Background

Section 111(a)(4) of the NWPA states that the Federal government has the: "responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment."

The NWPA directs the Secretary of Energy, if the Secretary decides to recommend approval of the Yucca Mountain site for development of a repository, to submit a final environmental impact statement with any recommendation to the President. The Department prepared the Yucca Mountain Final EIS to fulfill that requirement.

On February 14, 2002, the Secretary, in accordance with the NWPA, transmitted his recommendation (including the Yucca Mountain Final EIS) to the President for approval of the Yucca Mountain site for development of a geologic repository. The President considered the site qualified for application to the NRC for a construction authorization and recommended the site to the U.S. Congress. Subsequently, on July 23, 2002, the President signed into law (Pub. L. 107–200) a joint resolution of the U.S. House of Representatives and the U.S. Senate designating the Yucca Mountain site for development as a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste. The Department is now preparing a license application for submittal to the NRC seeking authorization to construct the repository, as required by the NWPA (Section 114(b)).

In the Yucca Mountain Final EIS, DOE considered the potential environmental impacts of a repository design for surface and subsurface facilities, a range of canister packaging scenarios and repository thermal operating modes, and plans for the construction, operation and monitoring, and eventual closure of the repository. The Yucca Mountain Final EIS also described and evaluated the transportation of spent nuclear fuel and high-level radioactive waste from commercial and DOE sites to the repository by two principal modes—mostly truck and mostly rail. DOE recognized at that time that these repository design concepts and operational plans would continue to develop during the design and engineering process.

More specifically, the Yucca Mountain Final EIS included evaluations of separate canistered and uncanistered packaging scenarios for commercial spent nuclear fuel, and a repository design comprised of three primary surface operations areas (North Portal Operations Area, South Portal Development Area, Ventilation Shaft Operations Area) in which spent nuclear fuel and high-level radioactive waste would be handled in two principal facilities (Carrier Preparation Building, Waste Handling Building). The Yucca Mountain Final EIS also evaluated a range of underground thermal operating modes (referred to as lower- and higher-temperature modes) in which heat from the waste packages would raise the temperature of the adjacent rock to a range of temperatures from below the boiling point of water to above the boiling point. Two scenarios, mostly truck and mostly rail, were analyzed for the transportation of spent nuclear fuel and high-level radioactive waste from the commercial and DOE sites to the repository.

Since publication of the Yucca Mountain Final EIS, DOE has continued to develop the repository design and associated plans. As now planned (and described in greater detail in the Proposed Action below), the proposed surface and subsurface facilities would allow DOE to operate the repository following a primarily canistered approach in which most commercial spent nuclear fuel would be packaged at the commercial sites in TADs, and all DOE materials would be packaged in disposable canisters at the DOE sites. These TADs and disposable canisters then would be transported mostly by rail [3] to the repository where they would be placed on aging (or staging) [4] pads prior to disposal, or inserted into waste packages and disposed of in the repository underground.

At the repository site, spent nuclear fuel and high-level radioactive waste would now be handled in up to six principal facilities located within three primary surface operations areas. A fourth operations area would be developed to support excavation of the underground repository. A higher-thermal (temperature) operating mode would be employed.

Based on the current planning, the Department does not believe that any of the developments to the repository design or operational plans would have a significant impact on the environmental effects considered in the Yucca Mountain Final EIS. Nevertheless, to assist NRC in satisfying its NEPA responsibilities pursuant to the NWPA (Section 114(f)(4)), DOE has decided to prepare this Supplemental EIS.

Proposed Action

Under the Proposed Action, DOE would construct, operate and monitor, and eventually close a geologic repository at Yucca Mountain for the disposal of up to 70,000 metric tons of heavy metal (MTHM) of commercial and DOE-owned spent nuclear fuel and high-level radioactive waste.[5] DOE would dispose of these materials in the repository using the inherent, natural geologic features of the mountain and engineered barriers to ensure long-term isolation of the spent nuclear fuel and high-level radioactive waste from the human environment. These materials would be emplaced underground at least 200 meters (660 feet) below the surface and at least 160 meters (530 feet) above the water table. The NRC, through its licensing process, would regulate repository construction, operation and monitoring, and closure.

Under the Proposed Action, most spent nuclear fuel and high-level radioactive waste would be shipped from 72 commercial and 4 DOE sites [6] to the repository in NRC-certified transportation casks placed on trains dedicated only to these shipments. Some shipments, however, would arrive at the repository by truck.

Under the Proposed Action, all DOE spent nuclear fuel and high-level radioactive waste would be placed in disposable canisters at the DOE sites, and as much as 90 percent of the commercial spent nuclear fuel would be placed in TADs at the commercial sites prior to shipment. Upon arrival at the repository, both types of canisters (DOE disposable and TADs) would be placed into corrosion-resistant overpacks

[3] On April 8, 2004 (69 FR 18557), the Department issued a Record of Decision selecting, both nationally and in the State of Nevada, the mostly rail scenario analyzed in the Yucca Mountain Final EIS. This decision will ultimately require the construction of a rail line to connect the repository site at Yucca Mountain to an existing rail line in the State of Nevada.

[4] The terminology refers to retaining commercial spent nuclear fuel on the surface at the repository to meet waste package thermal limits (aging), or to provide a surge capacity to maintain flexibility in waste handling operations (staging).

[5] The 70,000 MTHM includes 63,000 MTHM of commercial spent nuclear fuel, about 2,333 MTHM of DOE fuel (includes about 65 MTHM of naval fuel), and about 4,667 MTHM of DOE high-level radioactive waste.

[6] In 2002, fifty-four additional sites, primarily domestic research reactors, were expected to ship spent nuclear fuel to two DOE sites prior to disposal at the repository (see Records of Decision June 1, 1995 at 60 FR 28680, and March 8, 1996 at 61 FR 9441). Also, the Yucca Mountain Final EIS analyzed fuel shipments from 5 DOE sites, including Fort St. Vrain, to the repository. Presently, it is anticipated that fuel from Fort St. Vrain will be shipped to Idaho National Laboratory prior to being shipped to the repository.

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(waste packages) prior to emplacement in the repository underground.

The remaining commercial spent nuclear fuel (about 10 percent) would be transported to the repository in dual-purpose canisters (canisters suitable for storage and transportation), or would be uncanistered. At the repository, uncanistered spent nuclear fuel would be placed directly into TADs and then waste packages for disposal. Commercial spent nuclear fuel arriving in dual-purpose canisters would first be removed from the canisters, placed into TADs and then into waste packages for disposal.

Handling of spent nuclear fuel and high-level radioactive waste would take place in the geologic repository operations area, which includes the North Portal area, the South Portal development area, a North Construction Portal development area, and the surface shaft areas. The surface portion of the geologic repository operations area also would include the facilities necessary to receive, package, and support emplacement of spent nuclear fuel and high-level radioactive waste in the repository. Waste transfer operations would be conducted inside reinforced concrete and metal frame buildings designed and constructed to withstand earthquakes and other phenomena. Workers and the public would be protected from radiation by shielded transfer equipment and walls, exhaust filtering systems, and the use of remotely controlled equipment to remove the waste forms from the transportation casks for insertion into waste packages.

The primary surface waste handling facilities include a wet handling facility, a receipt facility, and three separate canister receipt and closure facilities. DOE also is considering an initial handling facility. These facilities would allow the various types of materials received at the repository to be prepared for disposal.

The wet handling facility would receive commercial spent nuclear fuel as bare fuel assemblies (uncanistered) or in dual-purpose canisters, either in truck or rail transportation casks. Commercial spent nuclear fuel would be transferred underwater from the transportation casks or dual-purpose canisters into TADs. The wet handling facility would include provisions for opening transportation casks and dual-purpose canisters, and for drying and closing the loaded TADs. Loaded TADs either would be placed into overpacks for placement on aging/staging pads, or would be transferred to the canister receipt and closure facilities for loading into waste packages for disposal.

The receipt facility would receive TADs and dual-purpose canisters in rail transportation casks. The TADs and dual-purpose canisters would be transferred (dry) from the transportation casks either to overpacks for placement on the aging/staging pads, or to shielded transfer casks for transfer to the canister receipt and closure facilities. Shielded transfer casks also would transfer dual-purpose canisters to the wet handling facility, as necessary.

The canister receipt and closure facilities would receive DOE disposable canisters and TADs in rail transportation casks, shielded transfer casks and aging/staging overpacks. These facilities also could receive truck casks. There, TADs and DOE disposable canisters would be placed into waste packages for disposal.

If constructed, the initial handling facility would receive DOE high-level radioactive waste canisters and naval spent nuclear fuel canisters in truck and rail transportation casks. These canisters would be removed from the transportation casks and transferred to waste packages for disposal.

Waste packages containing TADs, naval nuclear spent fuel, or DOE disposable canisters would be placed on pallets and loaded onto shielded waste package transporters. The shielded waste package transporters would transfer the waste packages to the underground for emplacement in dedicated tunnels (drifts). In these drifts, waste packages would be aligned end-to-end. Emplacement drifts would be excavated in a series of panels, phased to match the anticipated throughput rate of the surface waste handling facilities.

The repository also would have other underground excavations. These would include, for example, main drifts to provide access to the surface and the emplacement drifts, and exhaust mains to exhaust ventilation air from the emplacement drifts.

Under the Proposed Action, thermal output of the waste packages would heat the adjacent rock in excess of the boiling temperature of water (i.e., higher-thermal operating mode). In this higher-thermal mode, the repository emplacement drifts would remain open and ventilated for a nominal period of 50 years after emplacement of the spent nuclear fuel and high-level radioactive waste; ventilation would remove much of the heat and humidity from the emplacement drifts during this period. The higher thermal operating mode would be achieved by a combination of closely spaced waste packages, a nominal ventilation period of 50 years, and managing waste package thermal output by mixing lower heat output waste packages with higher heat output packages in the drifts (for example).

After the repository is closed and sealed, the rock around the emplacement drifts would dry, minimizing the amount of water that might contact the waste packages for hundreds of years. However, a substantial portion of the rock between the drifts would remain at temperatures below boiling, and this would promote drainage of water through the central portions of the rock, rather than into the emplacement drifts.

The surface and subsurface facilities and associated infrastructure,[7] such as the on-site road and water distribution networks and emergency response facilities, would be constructed in phases to accommodate the expected receipt rates of spent nuclear fuel and high-level radioactive waste. Emplacement (disposal) operations, which would last up to 50 years, would be followed by a preclosure monitoring period of 50 years. Towards the end of the preclosure monitoring period, titanium drip shields would be installed over the waste packages. The drip shields would divert moisture that might drip from the drift walls, as well as condensed water vapor around the waste packages, to the drift floor thereby increasing the life expectancy of the waste packages. Drip shields also would protect the waste packages from rock falls.

Under the Proposed Action, emplaced waste packages could be retrieved at any time prior to 100 years after the start of emplacement. Following waste emplacement, surface facilities would be decommissioned and after the monitoring period the repository would be closed. Closure would involve sealing the shafts, ramps, exploratory boreholes and other repository openings. The main drifts would be filled with crushed rock and surface caps would be installed to discourage human intrusion. A network of monuments and markers would be erected around the site surface to warn

[7] DOE published a "Draft Environmental Assessment for the Proposed Infrastructure Improvements for the Yucca Mountain Project, Nevada" on July 6, 2006 (71 FR 38391). DOE proposes to repair, replace, or improve certain infrastructure at the site to enhance safety and to safely continue operations, scientific testing, and maintenance until such time as NRC decides whether to authorize construction of a repository. To the extent that activities proposed by DOE in its environmental assessment, such as construction of a new access road or new power lines, may not be undertaken in the timeframe considered in the environmental assessment, they will be considered in this Supplemental Yucca Mountain EIS (DOE/EIS-0250F-S1).

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future generations of the presence and nature of the buried radioactive waste.

No Action Alternative

Under the No Action Alternative, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. Commercial nuclear power utilities and DOE would continue to manage spent nuclear fuel and high-level radioactive waste at sites throughout the United States. The No Action Alternative was analyzed in the Yucca Mountain Final EIS as a basis for comparison with the Proposed Action.

Since completion of the Yucca Mountain Final EIS, DOE has not identified any relevant changes in circumstances or information bearing on environmental concerns regarding the No Action Alternative. For this reason, DOE anticipates that the Supplemental Yucca Mountain EIS will incorporate by reference the information describing and analyzing the No Action Alternative presented in the Yucca Mountain Final EIS (pursuant to Council on Environmental Quality (CEQ) regulations at 40 Code of Federal Regulations (CFR) 1502.21).

Potential Environmental Issues and Resources To Be Examined

The CEQ regulations direct Federal agencies preparing an EIS to focus on significant environmental issues (40 CFR 1502.1) and discuss impacts in proportion to their significance (40 CFR 1502.2). Accordingly, the Supplemental Yucca Mountain EIS will analyze issues and impacts with the amount of detail commensurate with their importance. Under these guidelines, aspects of the Proposed Action with clearly small environmental impacts usually would require less depth and breadth of analysis. To the degree that the Proposed Action would affect public health or safety, however, the potential impacts generally are a matter of public interest, regardless of their significance. Therefore, DOE plans to pay particular attention to worker and public health and safety associated with the handling and disposal, and transportation of spent nuclear fuel and high-level radioactive waste, even where such impacts would not be significant.

To facilitate the scoping process, DOE has identified a preliminary list of issues and environmental resources that it may consider in the Supplemental Yucca Mountain EIS. The list is not intended to be all-inclusive, but should be used as a starting point for public input on the scope of the Supplemental Yucca Mountain EIS.

- Radiological releases. The potential impacts (i.e., latent cancer fatalities) to the public and workers from potential radiological releases during routine loading of canisters and transportation casks at the commercial sites, and from handling and disposal operations at the repository.
- Worker safety and health. Potential health and safety impacts (i.e., injuries and fatalities) to workers during handling and disposal operations at the commercial and DOE sites and the repository.
- Transportation. The potential radiological and non-radiological impacts (i.e., traffic injuries and fatalities) to the public and workers associated with the shipment of materials to the repository under the mostly rail scenario.
- Accidents. The potential radiological impacts to workers and the public from reasonably foreseeable accidents during loading of canisters at the sites, transportation and repository operations, including any accidents with low probability but high potential consequences.
- Sabotage. The potential radiological impacts to workers and the public from sabotage of transportation and repository operations.
- Waste isolation. Potential radiological and non-radiological impacts (e.g., chemically toxic materials) associated with the long-term performance of the repository.
- Socioeconomic conditions. Potential local regional socioeconomic impacts to the surrounding communities from construction, operation and closure of the repository.
- Water and air resources. Potential impacts to air resources, and water quality and use.
- Cultural resources. Potential impacts to archaeological and historic resources and American Indian issues of concern.
- Biological resources. Potential impacts to plants, animals and their habitats, including impacts to endangered and threatened species.
- Cumulative impacts from the Proposed Action and other past, present and reasonably foreseeable future actions.
- Environmental justice. Potential for disproportionately high and adverse impacts on minority or low-income populations.

Schedule

The DOE intends to issue the Draft Supplemental Yucca Mountain EIS in 2007, at which time its availability will be announced in the **Federal Register** and in media in Nevada. A public comment period will start upon publication of the Environmental Protection Agency's Notice of Availability in the **Federal Register**. DOE will hold public hearings during the comment period. The Department will consider and respond to comments received on the Draft Supplemental Yucca Mountain EIS in preparing the Final Supplemental Yucca Mountain EIS.

Other Agency Involvement

The Department intends to consult with Federal agencies, such as the U.S. Army Corps of Engineers, U.S. Bureau of Land Management, U.S. Air Force, and the U.S. Department of the Navy, and with state agencies, such as the Nevada Department of Transportation and the Nevada Division of Environmental Protection, during preparation of the Supplemental Yucca Mountain EIS.

Public Scoping Meetings

DOE will hold public scoping meetings on the Supplemental Yucca Mountain EIS. The meetings will be held at the following locations and times:

- Washington, District of Columbia, L'Enfant Plaza Hotel, 480 L'Enfant Plaza, SW., October 30 from 4–7 p.m.
- Amargosa Valley, Nevada. Longstreet Hotel Casino, Nevada State Highway 373, November 1 from 4–7 p.m.[8]
- Las Vegas, Nevada. Cashman Center, 850 North Las Vegas Blvd., November 2 from 4–7 p.m.

The public scoping meetings will be an open meeting format without a formal presentation by DOE. Members of the public are invited to attend the meetings at their convenience any time during meeting hours and submit their comments in writing at the meeting, or in person to a court reporter who will be available throughout the meeting. This open meeting format increases the opportunity for public comment and provides for one-on-one discussions with DOE representatives involved with

[8] DOE will hold a joint public scoping meeting on the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS (DOE/EIS–0250F–S2 and DOE/EIS–0369) and on the Supplemental Yucca Mountain EIS (DOE/EIS–0250F–S1) in Amargosa Valley, Longstreet Hotel Casino, Nevada State Highway 373, November 1 from 4–7 pm. Additional public scoping meetings on the Supplemental Yucca Mountain Rail Corridor and Rail Alignment EIS will be held in Caliente, Caliente Youth Center, U.S. 93 North, November 8 from 6–8 pm; Goldfield, Goldfield School Gymnasium, Hall and Euclid, November 13 from 4–7 pm; Hawthorne, Hawthorne Convention Center, 932 E. Street, November 14 from 4–7 pm; and Fallon, Fallon Convention Center, 100 Campus Way, November 15, from 4–7 pm.

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the Supplemental Yucca Mountain EIS and the repository program.

The public scoping meetings will be held during the public scoping comment period. The comment period begins with publication of this Notice of Intent in the **Federal Register** and closes November 27, 2006. Comments received after this date will be considered to the extent practicable. Written comments may be provided in writing, by facsimile, or via the Internet to Dr. Jane Summerson, EIS Document Manager (see **ADDRESSES** above).

Public Reading Rooms

Documents referenced in this Notice of Intent and related information are available at the following locations: Beatty Yucca Mountain Information Center, 100 North E. Avenue, Beatty, NV 89003, (775) 553–2130; Esmeralda County Yucca Mountain Oversight Office, 274 E. Crook Avenue, Goldfield, NV 89013, (775) 485–3419; Las Vegas Yucca Mountain Information Center, 4101–B Meadows Lane, Las Vegas, NV 89107, (702) 295–1312; Lincoln County Nuclear Waste Project Office, 100 Depot Avenue, Caliente, NV 89008, (775) 726–3511; Nye County Department of Natural Resources and Federal Facilities, 1210 E. Basin Road, Suite #6, Pahrump, NV 89060 (775) 727–7727; Pahrump Yucca Mountain Information Center, 2341 Postal Drive, Pahrump, NV 89048, (775) 571–5817; University of Nevada, Reno, The University of Nevada Libraries, Business and Government Information Center, M/S 322, 1664 N. Virginia Street, Reno, NV 89557, (775) 784–6500, Ext. 309; and the U.S. Department of Energy Headquarters Office Public Reading Room, 1000 Independence Avenue, SW., Room 1E–190 (ME–74) FORS, Washington, DC, 20585, 202–586–3142.

Issued in Washington, DC, October 10, 2006.

David R. Hill,

General Counsel.

[FR Doc. 06–8676 Filed 10–10–06; 4:15 pm]

BILLING CODE 6450–01–P

A.11 72 *FR* 1235, January 10, 2007

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DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NV-930-1920-ET-4662; NVN 82752; 7-08807]

Notice of Proposed Withdrawal and Opportunity for Public Meeting; Nevada

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice.

SUMMARY: The Department of Energy (DOE) has filed an application with the Bureau of Land Management (BLM) requesting the Secretary of the Interior to withdraw 208,037 acres of public lands from surface entry and mining through December 27, 2015, to evaluate the lands for the potential construction, operation, and maintenance of a rail line for the transportation of spent nuclear fuel and high-level radioactive waste in the event the Nuclear Regulatory Commission authorizes a geologic repository at Yucca Mountain as provided for under the Nuclear Waste Policy Act of 1982, as amended. This notice segregates the lands from surface entry and mining for up to 2 years while various studies and analyses are made to support a final decision on the withdrawal application.

DATES: Comments and requests for a public meeting should be received on April 10, 2007.

ADDRESSES: Comments and meeting requests should be sent to the Nevada State Director, BLM, P.O. Box 12000, Reno, Nevada 89520-0006.

FOR FURTHER INFORMATION CONTACT: Dennis J. Samuelson, BLM Nevada State Office, 775-861-6532.

SUPPLEMENTARY INFORMATION: The DOE has filed an application with the BLM requesting the Secretary of the Interior to withdraw the following described public lands from settlement, sale, location, or entry under the general land laws, including the United States mining laws, but not from leasing under the mineral leasing laws, subject to valid existing rights:

Mount Diablo Meridian

A corridor 1-mile in width that contains a portion of, or is wholly encompassed within the following sections and/or quarter sections and government lots:

Caliente Rail Corridor (additional lands)

T. 1 S., R. 42 E.,
Sec. 36, E½SE¼.
T. 2 S., R. 42 E.,
Sec. 1;
Sec. 2, SE¼;
Sec. 10, SE¼;
Sec. 11;
Sec. 12, N½ and SW¼;
Sec. 13, NW¼NW¼;
Secs. 14 and 15 (except patented land);
Sec. 22 (except patented land);
Sec. 23, W½NW¼ and W½SW¼ (except patented land);
Sec. 26, W½NW¼ and W½SW¼ (except patented land);
Secs. 27 and 34 (except patented land);
Sec. 35, W½ (except patented land).
T. 3 S., R. 42 E.,
Sec. 3 (except patented land);
Sec. 10, E½ and NE¼NW¼;
Secs. 11 and 12 (except patented land);
Sec. 13, N½ and N½SE¼;
Sec. 14, NE¼ and NE¼NW¼.
T. 1 N., R. 43 E.,
Sec. 33, SE¼SW¼ and SE¼.
T. 1 S., R. 43 E.,
Sec. 4, W½;
Sec. 5, SE¼NE¼ and SE¼;
Sec. 8, E½;
Sec. 9, W½;
Sec. 13, SW¼SW¼;
Sec. 14, SW¼;
Sec. 16, W½;
Sec. 17, E½;
Sec. 20;
Sec. 22, SE¼;
Sec. 23, W½ and SE¼;
Sec. 24, W½NW¼;
Sec. 26;
Sec. 27, E½;
Sec. 29;
Sec. 30, E½ and SE¼SW¼;
Sec. 31;
Sec. 32, NW¼NE¼ and W½;
Sec. 34, E½;
Sec. 35;
Sec. 36, W½ and W½SE¼.
T. 2 S., R. 43 E.,
Sec. 1;
Sec. 2, E½ and SE¼SW¼;
Sec. 6;
Sec. 7, NW¼NW¼;
Sec. 8, E½SE¼;
Sec. 11;
Sec. 12, NW¼NE¼, NW¼, and W½SW¼;
Sec. 13, W½;
Sec. 14;
Sec. 17, SE¼SE¼ (except patented land);
Sec. 20, NE¼ and SE¼SW¼ (except patented land);
Sec. 23, E½ and E½NW¼;
Sec. 24, NW¼NE¼, W½, and W½SE¼;
Sec. 25;
Sec. 26, NE¼ and E½SE¼ (except patented land);
Sec. 29, E½NW¼ and E½SW¼ (except patented land);
Sec. 32, NE¼NW¼ (except patented land);
Sec. 35, NE¼;
Sec. 36, E½ and NW¼.
T. 3 S., R. 43 E.,
Sec. 4, SE¼ (except patented land);
Sec. 7, (except patented land);
Sec. 8, S½ (except patented land);
Sec. 9, NE¼NE¼ (except patented land);
Sec. 13, SE¼;
Sec. 16, W½NW¼ and W½SW¼;
Sec. 17 (except patented land);
Sec. 18, lots 1, 2, and 3, NE¼, E½NW¼, NE¼SW¼, and N½SE¼ (except patented land);
Sec. 19, E½ and SE¼SW¼;
Sec. 20;

Sec. 21, NW¼NW¼;
Sec. 27, SW¼;
Sec. 28, S½NW¼ and S½;
Sec. 29;
Sec. 30, E½, E½NW¼, and NE¼SW¼;
Sec. 31, NE¼NE¼;
Sec. 32, N½;
Sec. 33, N½, NE¼SW¼, and N½SE¼;
Sec. 34, W½.
T. 4 S., R. 43 E.,
Sec. 3, lot 3 and SE¼NW¼;
Sec. 13, W½NW¼ and W½SW¼;
Sec. 21, SE¼SE¼;
Sec. 23, E½;
Sec. 24, NW¼NW¼;
Sec. 28, SE¼SW¼;
Sec. 32, SE¼SE¼.
T. 5 S., R. 43 E.,
Sec. 20, E½NE¼ and E½SE¼;
Sec. 29, NE¼NE¼.
T. 6 S., R. 44 E., Unsurveyed
Sec. 7;
Sec. 18, E½, E½NW¼, and E½SW¼;
Sec. 19, E½ and E½NW¼;
Sec. 20;
Secs. 28 and 29;
Sec. 30, E½NE¼;
Sec. 32, NE¼NE¼;
Sec. 33.
T. 7 S., R. 44 E., Partially Surveyed
Sec. 3, W½NW¼ and W½SW¼;
Sec. 4;
Sec. 5, S½SW¼ and SE¼SE¼;
Secs. 8 and 9;
Sec. 10, SW¼NW¼ and SW¼;
Secs. 15, 16, and 22;
Sec. 23, W½ and SW¼SE¼;
Sec. 25, SW¼SW¼;
Sec. 26;
Sec. 34, NE¼NE¼;
Sec. 35;
Sec. 36, W½ and SW¼SE¼.
T. 8 S., R. 44 E.,
Sec. 1;
Sec. 13, E½;
Sec. 24, NE¼NE¼.
T. 8 S., R. 45 E.,
Sec. 6, W½SW¼;
Sec. 7, W½ and SW¼SE¼;
Sec. 17, SW¼SW¼;
Sec. 19;
Sec. 20, W½.
T. 1 N., R 46 E.,
Sec. 30, lot 3.
T. 9 S., R. 46 E.,
Sec. 8, SW¼SW¼;
Sec. 16, SW¼ and SW¼SE¼;
Sec. 22, NW¼ and SE¼;
Sec. 23, S½SW¼.
T. 10 S., R. 46 E.,
Sec. 11, NE¼.
T. 1 N., R. 47 E.,
Sec. 9, SE¼SE¼;
Sec. 31, NE¼SW¼.
T. 2 N., R. 47 E.,
Sec. 24, SE¼SE¼;
Sec. 35, SE¼SW¼.
T. 10 S., R. 47 E.,
Sec. 9, SE¼;
Sec. 10, S½ and SE¼NE¼;
Sec. 11, S½NE¼, S½NW¼, and S½;
Sec. 13, W½;
Sec. 14 (except patented land);
Sec. 15, NE¼;
Sec. 22, W½NE¼ (except patented land);
Sec. 23, E½ and N½NW¼ (except patented land);
Sec. 24, W½NW¼;
Sec. 26, W½NE¼ and NW¼SE¼.
T. 11 S., R. 47 E.,
Sec. 10, NE¼NE¼;
Sec. 23, NE¼NE¼;
Sec. 24, E½SW¼;
Sec. 25, NE¼SE¼;
Sec. 36, E½NE¼.
T. 2 N., R. 48 E.,
Sec. 8, SE¼SW¼;
Sec. 19, SE¼NW¼.
T. 3 N., R. 48 E.,
Sec. 23, SE¼SW¼;
Sec. 33, SE¼SE¼.
T. 3 N., R. 49 E.,
Sec. 7, SE¼NE¼.
T. 3 N., R. 50 E.,
Sec. 22, E½SE¼.
T. 1 S., R. 51 E.,
Sec. 10, E½NE¼;
Sec. 14, E½NW¼;
Sec. 23, NE¼NE¼;
Sec. 25, W½;
Sec. 36, E½NW¼ and E½SW¼.
T. 2 N., R. 51 E.,
Sec. 18, lot 2.
T. 2 S., R. 52 E.,
Sec. 24, N½NE¼ and N½NW¼.
T. 1 S., R. 53 E.,
Sec. 26, SE¼SE¼;
Sec. 35, SE¼NW¼.
T. 1 S., R. 54 E.,
Sec. 1, lot 1;
Sec. 13, NW¼SW¼;
Sec. 16, SE¼SW¼;
Sec. 20, NE¼ and SE¼NW¼;
Sec. 23, NW¼NE¼.
T. 1 N., R. 55 E.,
Sec. 22, SE¼NW¼;
Sec. 29, S½NW¼.
T. 1 N., R. 56 E.,
Sec. 12, NW¼SE¼;
Sec. 14, NW¼SW¼;
Sec. 18, SE¼NW¼.
T. 1 N., R. 57 E.,
Sec. 2, lots 1 to 4, inclusive, and S½NW¼;
Sec. 3, NE¼;
Sec. 4, S½NE¼;
Sec. 5, NE¼SW¼ and NW¼SE¼;
Sec. 7, lot 1.
T. 2 N., R. 57 E.,
Sec. 1, lots 1 to 4, inclusive, S½NE¼, S½NW¼, and SW¼;
Sec. 2;
Sec. 3, SE¼NE¼ and SE¼;
Sec. 9, SE¼SE¼;
Sec. 10;
Sec. 11, N½ and SW¼;
Sec. 14, NW¼NW¼;
Sec. 15;
Sec. 16, E½ and S½SW¼;
Sec. 20, E½ and SW¼;
Sec. 21;
Sec. 22, NW¼NE¼ and NW¼;
Sec. 29, N½;
Sec. 30, E½ and SE¼SW¼;
Sec. 31, lots 1 and 2, and E½NW¼;
Sec. 36, SE¼.
T. 3 N., R. 57 E.,
Sec. 25, SE¼SE¼;
Sec. 35, SE¼;
Sec. 36.
T. 2 N., R. 58 E.,
Sec. 6, lot 4;
Sec. 25, S½;
Sec. 26, S½;
Sec. 31, lots 3 and 4, E½SW¼, and SE¼;
Sec. 32, S½;
Secs. 33 and 34;
Sec. 35, N½, SW¼, and NW¼SE¼;
Sec. 36, NW¼NW¼.
T. 3. N., R. 58 E.,
Sec. 13, S½NE¼, S½NW¼, and S½;
Sec. 14, S½NE¼, S½NW¼, and S½;
Sec. 15, S½;
Sec. 16, SE¼SE¼;
Sec. 20, SE¼SW¼ and SE¼;
Secs. 21 and 22;
Sec. 23, N½;
Sec. 24, N½;
Sec. 27, NW¼NW¼;
Sec. 28, N½ and SW¼;
Sec. 29;
Sec. 30, lots 3 and 4, S½NE¼, E½SW¼, and SE¼;
Sec. 31;
Sec. 32, NW¼NE¼ and NW¼.
T. 2 N., R. 59 E.,
Sec. 5, SE¼SE¼;
Sec. 7, SE¼SE¼;
Sec. 20, NW¼NE¼;
Sec. 30, lots 1 and 2, and E½NW¼.
T. 3 N., R. 59 E.,
Sec. 14, NE¼ and SW¼;
Sec. 17, SW¼SW¼;
Sec. 18, lots 2, 3, and 4, E½SW¼, and SE¼;
Sec. 19, lots 1 and 2, and W½NE¼;
Sec. 33, NE¼ and E½SW¼.
T. 4 N., R. 60 E.,
Sec. 21, S½NE¼ and SE¼NW¼;
Sec. 31, SE¼NW¼.
T. 4. N., R. 61 E.,
Sec. 19, S½NE¼ and SE¼NW¼;
Sec. 20, SW¼SE¼.
T. 2 N., R. 62 E.,
Sec. 9, NE¼NE¼;
Sec. 15, NE¼SE¼;
Sec. 23, E½ and NE¼NW¼.
T. 1 N., R. 63 E.,
Sec. 22, SW¼SW¼.
T. 1 S., R. 64 E.,
Sec. 19, lot 1.
T 2 S., R. 65 E.,
Sec. 1, lots 3 and 4, and S½NW¼.
T. 1 S., R. 66 E.,
Sec. 35, S½SW¼ and S½SE¼.
T. 2 S., R. 67 E.,
Sec. 21, E½SW¼;
Sec. 24, NE¼SW¼.
T. 3 S., R. 67 E.,
Sec. 21, SE¼NW¼ and S½SW¼SE¼;
Sec. 26, E½NE¼.
T. 4 S., R. 68 E.,
Sec. 7, E½NW¼;
Sec. 8, W½SE¼;
Sec. 17, NW¼NE¼.

The additional lands for the Caliente Corridor aggregate 68,646 acres in Esmeralda, Lincoln, and Nye Counties.

Mina Rail Corridor

T. 15 N., R. 26 E.,
Sec. 26, S½SE¼;
Sec. 35, lots 2, 3, and 4, E½NW¼, NE¼, and SE¼;
Sec. 36.
T. 9 N., R. 31 E.,
Sec. 32, lots 1 to 4, inclusive, N½SW¼, and N½SE¼.
T. 8 N., R. 32 E.,
Sec. 7, lots 3 and 4, E½SW¼;

Sec. 13, S½SW¼ and S½SE¼;
Sec. 14, S½SW¼ and S½SE¼;
Sec. 15, SW¼ and S½SE¼;
Sec. 16, S½NE¼, W½, and SE ¼;
Sec. 17, SE¼SW¼;
Sec. 19, N½NE¼ and N½NW¼;
Sec. 20, NE¼ and N½NW¼;
Sec. 21, N½ and N½SE¼ (except patented land);
Sec. 22, N½, N½SW¼, and SE¼;
Secs. 23 and 24.
T. 8 N., R. 33 E.,
Sec. 17, S½SW¼ and S½SE¼;
Sec. 18, lot 4, SE¼SW¼, and S½SE¼;
Secs. 19 to 24, inclusive;
Sec. 25, N½;
Sec. 26, N½;
Sec. 27, N½NE¼ and N½NW¼;
Sec. 28, N½NE¼ and N½NW¼;
Sec. 29, N½NE ¼ and N½NW ¼.
T. 7 N., R. 34 E.,
Sec. 1, lot 1 and SE¼NE¼.
T. 8 N., R. 34 E.,
Sec. 19, lots 2, 3, and 4, S½NE¼, SE¼NW¼, W½SW¼, and SE¼;
Sec. 20, S½NE¼, S½NW¼, and S½;
Sec. 21, S½NE¼, S½NW¼, and S½;
Sec. 22, S½;
Sec. 23, S½;
Sec. 24, S½ (except patented land);
Sec. 25;
Sec. 26, N½, N½SW¼, and N½SE¼;
Sec. 27, N½, N½SW¼, and N½SE¼;
Sec. 28, N½ and N½SE¼;
Sec. 29, N½;
Sec. 30, lots 1 and 2, NE¼, and E½NW¼;
Sec. 36, E½ and N½NW¼.
T. 4 N., R. 35 E.,
Sec. 1, N½ and SE¼;
Sec. 2, NE¼;
Sec. 12, N½NE¼.
T. 5 N., R. 35 E.,
Sec. 1, S½NE¼, S½NW¼, and S½;
Sec. 2;
Sec. 3, lots 1, 2, and 3, S½NE¼, and SE¼;
Sec. 11, NE¼ and N½NW¼;
Sec. 12, E½, NW¼, and E½SW¼;
Sec. 13, NE¼ and E½SE¼;
Sec. 24, E½;
Sec. 25, E½, E½NW¼, and SW¼;
Sec. 36.
T. 6 N., R. 35 E.,
Sec. 4, lot 4, SW¼NW¼, SW¼, and S½SE¼;
Sec. 5;
Sec. 8 (except patented lands);
Sec. 9;
Sec. 10, S½NW¼ and SW¼;
Sec. 15, W½ and W½SE¼;
Sec. 16, E½, NW¼, and E½SW¼;
Sec. 21, E½;
Sec. 22, W½NE¼, W½, and W½SE¼;
Sec. 27, W½NE¼, W½, and W½SE¼;
Sec. 28, NE¼ and N½SW¼;
Sec. 33, E½ (except patented land);
Sec. 34;
Sec. 35, S½SW¼.
T. 7 N., R. 35 E.,
Sec. 5, lot 4, S½NW¼, and SW¼;
Sec. 6;
Sec. 7, N½NE¼, E½NW¼, and SE¼;
Sec. 8, W½NE¼, W½, and SE¼;
Sec. 16, W½NW¼ and SW¼;
Sec. 17;
Sec. 18, E½NE¼;
Sec. 20;
Sec. 21, W½;
Sec. 28, NW¼ and W½SW¼;
Sec. 29;
Sec. 30, S½SE¼;
Sec. 31, E½NE¼;
Sec. 32;
Sec. 33, W½SW¼.
T. 8 N., R. 35 E.,
Sec. 30, lots 1 to 4, inclusive, E½NW¼, E½SW¼, and W½SE¼ (except patented land);
Sec. 31 (except patented land).
T. 3 N., R. 36 E.,
Sec. 1;
Sec. 12, E½, E½NW¼, and E½SW¼;
Sec. 13, E½;
Sec. 24, E½;
Sec. 25, N½NE¼.
T. 4 N., R. 36 E., Unsurveyed
Sec. 5, SW¼;
Sec. 6;
Sec. 7, N½ and SE¼;
Sec. 8, W½ and SE¼;
Sec. 9, S½SW¼;
Sec. 15, SW¼;
Sec. 16, W½ and SE¼;
Sec. 17;
Sec. 18, NE¼;
Sec. 20, NE¼;
Sec. 21, N½ and SE¼;
Sec. 22;
Sec. 23, S½;
Sec. 25, W½;
Sec. 26;
Sec. 27, N½;
Sec. 35, N½ and SE¼;
Sec. 36.
T. 5 N., R. 36 E., Unsurveyed
Sec. 6, SW¼;
Sec. 7, W½;
Sec. 18, W½;
Sec. 19, W½;
Sec. 30, W½;
Sec. 31, W½.
T. 2 N., R. 37 E.,
Sec. 4, W½SW¼;
Sec. 5;
Sec. 6, lots 1 and 2, S½NE¼, and E½SE¼;
Sec. 8;
Sec. 9, W½NW¼, SW¼, and S½SE¼;
Sec. 13, S½NE¼, S½NW¼, and S½;
Sec. 14, S½NE¼ and S½;
Sec. 15, NW¼ and S½;
Sec. 16;
Sec. 17, N½NE¼, SE¼NE¼, E½NW¼, and E½SE¼;
Sec. 21, NE¼;
Sec. 22, N½, N½SW¼, and N½SE¼;
Sec. 23, N½ and N½SW¼;
Sec. 24, N½.
T. 3 N., R. 37 E., Unsurveyed
Sec. 6, W½;
Sec. 7, W½ and E½SE¼;
Sec. 18, W½NE¼, W½, and W½SE¼;
Sec. 19;
Sec. 29, W½;
Sec. 30;
Sec. 31, E½ and E½NW¼;
Sec. 32, W½NE¼, W½, and W½SE¼.
T. 4 N., R. 37 E., Unsurveyed
Sec. 31, S½SW¼.
T. 1 N., R. 38 E., Unsurveyed
Sec. 3, W½NW¼ and SW¼;
Sec. 4;
Sec. 5, E½NE¼;
Sec. 9, E½ and E½NW¼;
Sec. 10;
Sec. 11, SW¼;
Sec. 14, W½NE¼, W½, and SE¼;
Sec. 15, E½ , NW¼, and N½SW¼;
Sec. 16, N½NE¼;
Sec. 22, NE¼;
Sec. 23;
Sec. 24, W½ and W½SE¼;
Sec. 25;
Sec. 26, NE¼ and E½SE¼;
Sec. 36, NE¼ and N½NW¼.
T. 2 N., R. 38 E., Unsurveyed
Sec. 13, S½SW¼ and SE¼;
Sec. 16, S½NW¼ and SW¼;
Secs. 17 and 18;
Sec. 19, N½;
Sec. 20, E½ and NW¼;
Sec. 21, W½ and SE¼;
Sec. 22, S½;
Sec. 23, NE¼, S½NW¼, and S½;
Sec. 24;
Sec. 25, N½NW¼;
Sec. 26, N½;
Sec. 27, N½;
Sec. 28;
Sec. 29, E½;
Sec. 32, E½;
Sec. 33.
T. 1 N., R. 38.2 E., Unsurveyed
Sec. 30, S½NW¼, SW¼, and S½SE¼;
Sec. 31, N½, N½SW¼, and SE¼;
Sec. 32, W½ and SE¼.
T. 2 N., R. 38.2 E.,
Sec. 4;
Sec. 5, S½SE¼;
Sec. 7, S½SE¼;
Sec. 8, E½, S½NW¼, and SW¼;
Sec. 9;
Sec. 16, N½NW¼;
Sec. 17, N½, SW¼, and N½SE¼;
Sec. 18;
Sec. 19, N½ and N½SW¼;
Sec. 20, N½NW¼.
T. 1 S., R. 39 E.,
Sec. 4, lots 3 and 4, S½NW¼, and S½;
Sec. 5;
Sec. 6, lots 1 and 2, and S½NE¼;
Sec. 8, NE¼;
Sec. 9;
Sec. 10, W½NW¼ and SW¼;
Sec. 14, W½SW¼;
Sec. 15;
Sec. 16, E½ and E½NW¼;
Sec. 21, N½NE¼;
Sec. 22;
Sec. 23, W½NW¼ and W½SW¼;
Sec. 26, W½NW¼ and W½SW¼;
Sec. 27, E½, E½NW¼, and E½SW¼;
Sec. 34, E½, E½NW¼, and SW¼;
Sec. 35, W½.
T. 2 N., R. 39 E., Unsurveyed
Sec. 4, NW¼;
Sec. 5, N½ and SW¼;
Sec. 6;
Sec. 7, N½ and SW¼.
T. 2 S., R. 39 E.,
Sec. 2, lot 4, S½NW¼, and SW¼;
Sec. 3, lots 1 to 4, inclusive, S½NE¼, S½NW¼, E½SW¼, and SE¼;
Sec. 10, E½, E½NW¼, and E½SW¼;
Sec. 11, W½;
Sec. 14, W½NE¼, W½, and W½SE¼;
Sec. 15, E½ and E½NW¼;
Sec. 22 (except patented land);
Sec. 23, W½NE¼, W½, and W½SE¼;
Sec. 25, S½SW¼;

Sec. 26;
Sec. 27, E½;
Sec. 34, N½NE¼;
Sec. 35;
Sec. 36, W½ and SE¼.
T. 3 N., R. 39 E.,
Sec. 13, S½SE¼;
Sec. 22, S½SE¼;
Sec. 23, S½NE¼ and S½;
Sec. 24;
Sec. 25, N½ and N½SW¼;
Secs. 26 and 27;
Sec. 28, S½NE¼ and S½;
Sec. 29, S½SE¼;
Sec. 31, S½SW¼ and SE¼;
Secs. 32 and 33;
Sec. 34, N½ and N½SW¼;
Sec. 35, N½NW¼.
T. 3 S., R. 39 E.,
Sec. 1;
Sec. 2, lots 1 and 2, S½NE¼, and E½SE¼;
Sec. 12, NE¼.
T. 2 S., R. 40 E.,
Sec. 22, S½SW¼ and SE¼;
Sec. 23, S½ and S½NE¼;
Sec. 24, NE¼, S½NW¼, and S½;
Sec. 25, N½;
Sec. 26, N½, N½SW¼, and N½SE¼;
Sec. 27;
Sec. 28, lot 1 and lots 3 to 8, inclusive, and SW¼;
Sec. 29, S½SE¼;
Sec. 31, E½SW¼ and SE¼;
Sec. 32;
Sec. 33, N½, SW¼, and N½SE¼;
Sec. 34, NW¼.
T. 3 N., R. 40 E.,
Sec. 8, S½SE¼;
Sec. 9, S½NE¼ and S½;
Sec. 10 (except patented land);
Sec. 11 (except patented land);
Sec. 12, S½NE¼, S½NW¼, and S½;
Sec. 13, N½ and N½SE¼;
Sec. 14, N½ (except patented land);
Sec. 15, N½ and N½SW¼;
Secs. 16 and 17;
Sec. 18, lot 4, S½NE¼, E½SW¼, and SE¼;
Sec. 19;
Sec. 20, N½ and N½SW¼;
Sec. 21, N½NW¼;
Sec. 30, lot 1 and E½NW¼.
T. 3 S., R. 40 E.,
Sec. 4, lot 4;
Sec. 5, lots 1 to 4, inclusive, S½NE¼, S½NW¼, and SW¼;
Sec. 6;
Sec. 7, lot 1, E½NW¼, and N½NE¼.
T. 2 S., R. 40.2 E., Unsurveyed
Sec. 4, S½SE¼;
Sec. 8, E½ and SW¼;
Sec. 9;
Sec. 16, N½;
Sec. 17;
Sec. 18, S½NE¼, S½SW¼, and SE¼;
Sec. 19;
Sec. 20, NE¼ and W½;
Sec. 30, N½.
T. 1 N., R. 41 E.,
Sec. 1;
Sec. 2, lots 1 and 2, S½NE¼, and E½SE¼;
Sec. 12, N½, E½SW¼, and SE¼;
Sec. 13, E½.
T. 2 N., R. 41 E.,
Sec. 3, lots 2, 3, and 4, S½NE¼, S½NW¼, and S½;
Sec. 4, lots 1, 2, and 3, S½NE¼, S½NW¼, and SE¼;
Sec. 9, NE¼;
Sec. 10;
Sec. 11, W½;
Sec. 14;
Sec. 15, E½ and E½NW¼;
Sec. 22, N½NE¼;
Sec. 23;
Sec. 24, W½NW¼ and W½SW¼;
Sec. 25, W½;
Sec. 26, E½, NW¼, and E½SW¼;
Sec. 35, E½ and E½NW¼;
Sec. 36, W½NE¼, W½, and SE¼.
T. 2 S., R. 41 E.,
Sec. 3, W½SW¼;
Sec. 4, S½NE¼, S½NW¼, and S½;
Sec. 5, S½NE¼ and S½;
Sec. 6, lots 10 to 16, inclusive, and S½SE¼;
Secs. 7, 8, and 9;
Sec. 10, W½NW¼ and W½SW¼;
Sec. 15, W½NW¼;
Sec. 16;
Sec. 17, E½ and SW¼;
Sec. 18, N½NE¼;
Sec. 19, E½NE¼ and E½SE¼;
Sec. 20;
Sec. 21, NW¼ and N½SW¼;
Sec. 29, NE¼, W½, and W½SE¼;
Sec. 30, E½;
Sec. 31, lots 8 to 11, inclusive, and E½;
Sec. 32, N½NE¼ and W½.
T. 3 N., R. 41 E.,
Sec. 7, lots 3 and 4, E½SW¼, and SE¼;
Sec. 8, SW¼;
Sec. 16, S½SW¼; secs. 17 and 18;
Sec. 19, N½NE¼;
Sec. 20;
Sec. 21, W½ and W½SE¼;
Sec. 27, S½SW¼;
Sec. 28;
Sec. 29, E½;
Sec. 32, N½NE¼;
Sec. 33;
Sec. 34, W½ and S½SE¼.
T. 3 S., R. 41 E.,
Sec. 4, lot 4 and S½NW¼;
Sec. 5;
Sec. 6, lot 1, SE¼NE¼, and SE¼;
Sec. 7, E½;
Sec. 8, W½NE¼, W½, and W½SE¼;
Sec. 16, SW¼ and S½SE¼ (except patented land);
Sec. 17;
Sec. 18, E½;
Sec. 19, N½NE¼;
Sec. 20, N½ and SE¼;
Sec. 21;
Sec. 22, S½NE¼, W½, and SE¼;
Sec. 23, S½;
Sec. 24, S½;
Sec. 25;
Sec. 26, N½, N½SW¼, and N½SE¼;
Sec. 27, N½;
Sec. 28, NE ¼.
T. 1 N., R. 42 E.,
Sec. 6, lots 6 and 7, and E½SW¼;
Sec. 7, lots 1 to 4, inclusive, E½NW¼, E½SW¼, and W½SE¼;
Sec. 17, SW¼;
Sec. 18;
Sec. 19, lot 1, E½NW¼, and E½;
Sec. 20;
Sec. 21, SW¼;
Sec. 28, W½NE¼, W½, and SE¼;
Sec. 29;
Sec. 30, N½NE¼;
Sec. 32, NE¼;
Sec. 33;
Sec. 34, W½ and W½SE¼.
T. 1 S., R. 42 E.,
Sec. 3;
Sec. 4, lots 1 and 2, S½NE¼, and SE¼;
Sec. 9, E½NE¼;
Sec. 10;
Sec. 11, W½SW¼;
Sec. 14, W½NW¼ and W½SW¼;
Secs. 15 and 22;
Sec. 23, W½;
Sec. 26, W½;
Sec. 27, E½, E½NW¼, and E½SW¼;
Sec. 34, E½, E½NW¼, and E½SW¼;
Sec. 35, W½.
T. 2 S., R. 42 E.,
Sec. 2, lots 3 and 4, S½NW¼, and W½SW¼;
Sec. 3, lots 1, 2, and 3, S½NE¼, S½NW¼, E½SW¼, and SE¼;
Sec. 10;
Sec. 11, W½NW¼ and W½SW¼;
Sec. 14, W½NW¼ and W½SW¼ (except patented land);
Secs. 15 and 22 (except patented land);
Sec. 23, W½NW¼ and W½SW¼ (except patented land);
Sec. 26, W½NW¼ and W½SW¼ (except patented land);
Secs. 27 and 34 (except patented land);
Sec. 35, W½NW¼ and W½SW¼ (except patented land).
T. 3 S., R. 42 E.,
Sec. 3, lots 1, 2, and 3, S½NE¼, S½NW¼, E½SW¼, and SE¼ (except patented land);
Sec. 10, NE¼ and E½SE¼ (except patented land);
Secs. 11 and 12 (except patented land);
Sec. 13, N½ (except patented land);
Sec. 14, N½NE¼ (except patented land);
Sec. 19, lots 4 to 9 inclusive, and S½SE¼;
Sec. 20, S½SW¼ and S½SE¼;
Sec. 28, W½NE¼, W½, and SE¼;
Secs. 29 and 30;
Sec. 32, N½NE¼ and S½SE¼;
Sec. 33.
T. 4 S., R. 42 E.,
Sec. 4;
Sec. 5, lot 1, S½NE¼, and SE¼;
Sec. 8, E½, E½NW¼, and E½SW¼;
Sec. 9, W½NE¼ and W½;
Sec. 16, W½;
Sec. 17;
Sec. 18, S½SE¼;
Sec. 19, E½NE¼ and E½SE¼;
Sec. 20;
Sec. 23, S½SW¼ and S½SE¼;
Sec. 24, S½SW¼ and S½SE¼;
Secs. 25 and 26;
Sec. 27, NE¼ and S½;
Sec. 28, W½NW¼, W½SW¼, and SE¼;
Secs. 29, 32, and 33;
Sec. 34, N½, SW¼, and N½SE¼;
Sec. 35, N½NE¼ and NW¼.
T. 5 S., R. 42 E., Unsurveyed
Sec. 4, N½NE¼ and N½NW¼;
Sec. 5, N½NE¼.
T. 3 S., R. 43 E.,
Sec. 7 (except patented land);
Sec. 8, S½ (except patented land);
Sec. 16, W½NW¼ and W½SW¼;
Secs. 17 and 18 (except patented land);

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Sec. 19, E½ and E½SW¼;
Sec. 20;
Sec. 21, N½NW¼;
Sec. 27, S½;
Sec. 28, S½NE¼, S½NW¼, and S½;
Sec. 29;
Sec. 30, E½ and E½NW¼;
Sec. 31, N½NE¼;
Sec. 32, N½;
Sec. 33, N½ and SE¼;
Sec. 34;
Sec. 35, E½NW¼ and E½SW¼.
T. 5 S., R. 43 E., Unsurveyed
Sec. 6;
Sec. 7, E½ and E½NW¼;
Sec. 18, N½NE¼.

The lands in the Mina Corridor aggregate 139,391 acres in Esmeralda, Lyon, and Mineral Counties.

Public Land Order (PLO) No. 7653, 70 FR 76854–76858 (December 28, 2005), withdrew approximately 308,600 acres of public lands from surface entry and mining for the purpose of evaluating a suite of alternative rail alignments along the Caliente Corridor, as described in the DOE's Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, February 2002. The evaluation is for the potential construction, operation, and maintenance of a rail line which would be used to transport spent nuclear fuel and high-level radioactive waste to the proposed Yucca Mountain Repository as part of the DOE's responsibility under the Nuclear Waste Policy Act, as amended, 42 U.S.C. 10101 *et seq.*

The DOE has identified an additional 68,646 acres of public lands for evaluation along the Caliente Corridor. Since PLO No. 7653 can not be amended to add lands, the DOE has filed this new withdrawal application for those additional lands.

The DOE's withdrawal application also includes 139,391 acres of public lands for the purpose of evaluating the potential construction, operation, and maintenance of a rail line along a suite of alternative rail alignments referred to by the DOE as the "Mina Route." The width of the withdrawal is 1 mile.

The expiration date for this proposed withdrawal would be the same as the expiration date for PLO No. 7653, which is December 27, 2015.

The use of a right-of-way, interagency agreement, or cooperative agreement would not adequately constrain non-discretionary uses that could irrevocably affect the evaluation of these lands for a potential rail line alignment.

There are no suitable alternative sites, since the lands described identify the alternative alignments that need to be evaluated.

No water rights will be needed to fulfill the purpose of the withdrawal.

Possible mineral deposits present in the above-described land areas include some locatable and salable minerals.

For a period of 90 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the BLM Nevada State Director.

Comments, including names and street addresses of respondents, will be available for public review at the BLM Nevada State Office, 1340 Financial Blvd., Reno, Nevada, during regular business hours, 7:30 a.m. to 4:30 p.m., Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comments. Such requests will be honored to the extent allowed by the law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Notice is hereby given that in addition and subsequent to the 90-day public comment period mentioned above, there will be at least one public meeting in connection with the proposed withdrawal to be announced at a later date. A notice of the time, place, and date will be published in the **Federal Register** and a local newspaper at least 30 days before the scheduled date of a meeting.

This withdrawal proposal will be processed in accordance with the regulations set forth in 43 CFR part 2300.

For a period of 2 years from the date of publication of this notice in the **Federal Register**, the lands described above will be segregated as specified above unless the application is denied or cancelled or the withdrawal is approved prior to that date.

Licenses, permits, cooperative agreements, or discretionary land use authorizations of a temporary nature which will not significantly impact the purpose of the proposed withdrawal may be allowed with the approval of the authorized officer of the BLM during the segregative period.

(Authority: 43 CFR 2310.3–1(a))

Dated: October 30, 2006.

Margaret L. Jensen,

Deputy State Director, Natural Resources, Lands, and Planning.

[FR Doc. E7–84 Filed 1–9–07; 8:45 am]

BILLING CODE 4310–HC–P

A.12 72 *FR* 40139, July 23, 2007

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DEPARTMENT OF ENERGY

Office of Civilian Radioactive Waste Management; Safe Routine Transportation and Emergency Response Training; Technical Assistance and Funding

AGENCY: Department of Energy.

ACTION: Notice of revised proposed policy and request for comments.

SUMMARY: The Department of Energy (DOE) is publishing this notice of revised proposed policy to set forth its revised plans for implementing Section 180(c) of the Nuclear Waste Policy Act of 1982 (the NWPA). Under Section 180(c) of the NWPA, DOE shall provide technical and financial assistance for training of local public safety officials to States and Indian Tribes through whose jurisdictions the DOE plans to transport spent nuclear fuel or high-level

radioactive waste to a facility authorized under Subtitle A or C of the NWPA (NWPA-authorized facility). The training is to cover both safe routine transportation and emergency response procedures. The purpose of this notice is to communicate to stakeholders the revised proposed policy of DOE regarding Section 180(c) issues and request comments on this revised proposed policy and the questions specified herein. Written and electronic comments may be submitted to DOE on this document.

DATES: Comments must be received by DOE on or before October 22, 2007.

ADDRESSES: Written comments should be directed to Ms. Corinne Macaluso, U.S. Department of Energy, c/o Patricia Temple, Bechtel SAIC Company, LLC, 955 N. L'Enfant Plaza, SW., Suite 8000, Washington, DC 20024. The revised proposed policy and electronic comment forms are also available at *http://www.ocrwm.doe.gov*. Fill out the form and click "submit" to send your comments in through the Web site. Persons submitting comments should include their name and address. Receipt of written comments in response to this notice will be acknowledged if a stamped, self-addressed postal card or envelope is enclosed. Electronic comments will receive an electronic notice of receipt.

FOR FURTHER INFORMATION CONTACT: For further information on the transportation of spent nuclear fuel and high-level radioactive waste under the NWPA, please contact: Ms. Corinne Macaluso, Office of Logistics Management, Office of Civilian Radioactive Waste Management (RW-10), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC, 20585, Telephone: 202-586-2837.

General program information is available on the Office of Civilian Radioactive Waste Management (OCRWM) Web site located at *www.ocrwm.doe.gov*.

Copies of comments received will be posted on the OCRWM Web site. Please allow up to two weeks after DOE receives comments to view them on the Web site.

Request for Comments: DOE will consider all comments submitted by the closing date. Comments received after that date will be considered to the extent practicable. DOE requests that commenters pay particular attention to the questions at the end of this revised proposed policy.

SUPPLEMENTARY INFORMATION:

I. Purpose and Need for Agency Action

Under the NWPA, DOE is responsible for the transportation of spent nuclear fuel and high-level radioactive waste to an NWPA-authorized facility. In particular, under Section 180(c) of the NWPA, DOE is responsible for providing technical and financial assistance for training of local public safety officials to States and Indian Tribes through whose jurisdiction the Secretary plans to transport spent nuclear fuel or high-level radioactive waste to an NWPA-authorized facility. Section 180(c) further provides that such training cover procedures required for both safe routine transportation of these materials and for dealing with emergency response situations. Section 180(c) identifies the Nuclear Waste Fund as the source of funds for this assistance.

DOE has announced a schedule to begin shipping spent nuclear fuel and high-level radioactive waste to an NWPA-authorized facility in 2017.[1] Subject to the availability of appropriated funds, DOE plans to conduct a pilot program for 180(c) grants beginning in fiscal year 2008. DOE will evaluate public comments received on this revised proposed policy prior to implementing the pilot program. After review of the comments received on this revised proposed policy and completion of the pilot program, DOE plans to issue a new revised proposed policy for public comment and thereafter to issue a final policy prior to awarding the first 180(c) grants. The first grants are planned to be issued approximately four years prior to the commencement of shipments through a State or Tribe's jurisdiction to support assessing the need for and planning for training.

The *Office of Civilian Radioactive Waste Management, Strategic Plan for the Safe Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste to Yucca Mountain: A Guide to Stakeholder Interactions* calls for DOE to work closely with State Regional Groups and individual impacted States and Tribes as it makes operational decisions regarding shipments to an NWPA-authorized facility. The DOE's practice of involving States, Tribes, industry, utilities, and other interested parties in transportation planning has contributed to a decades-long record of safely transporting such material. This revised proposed policy supports the DOE's OCRWM objective to develop and begin implementation of a comprehensive national spent fuel transportation plan that accommodates State, local, and Tribal concerns and input to the greatest extent practicable.

II. Background

On January 3, 1995, DOE issued a proposed policy on how it would implement Section 180(c) of the NWPA (60 FR 99). DOE subsequently issued several notices relating to its proposed 180(c) policy in the **Federal Register** on July 18, 1995 (60 FR 36793), May 16, 1996 (61 FR 24772), July 17, 1997 (62 FR 38272), and April 30, 1998 (63 FR 23753). DOE is publishing this Notice of Revised Proposed Policy to set forth and communicate to stakeholders the revised policy by which DOE currently intends to implement Section 180(c). DOE previously requested comments on the 1998 Notice of Revised Proposed Policy and Procedures. Those comments were reviewed and considered during the development of this revised proposed policy.

As part of its longstanding commitment to work with stakeholders on transportation matters, DOE has engaged in ongoing discussions on how to implement Section 180(c). Such discussions have taken place in the context of the Transportation External Coordination (TEC) Working Group, which is comprised of representatives of State, Tribal, and local governments, and professional, technical, and industry associations, and which meets biannually to identify and discuss issues related to the transport of radioactive materials. In 2004, DOE formed a TEC Topic Group specifically to discuss Section 180(c) issues, and the Topic Group met at least monthly from June 2004 through November 2005. In addition, DOE has discussed Section 180(c) issues with the six national and regional organizations with which DOE has cooperative agreements. These agreements enable DOE to exchange information and solicit input regarding the planned transportation activities of OCRWM, including Section 180(c) activities. These organizations comprise the four State Regional Groups (the Southern States Energy Board, Western Interstate Energy Board, Council of State Governments Midwestern Office, and Council of State Governments Eastern Regional Conference), the Commercial Vehicle Safety Alliance, and the

[1] The schedule for the proposed Yucca Mountain repository is based on factors within the control of DOE, appropriations consistent with optimum Project execution, issuance of an Nuclear Regulatory Commission (NRC) Construction Authorization consistent with the three year period specified in the Nuclear Waste Policy Act, and the timely issuance by the NRC of a Receive and Possess license. This schedule also is dependent on the timely issuance of all necessary other authorizations and permits, the absence of litigation related delays, and the enactment of legislation proposed by the Administration.

National Conference of State Legislatures.

Through the TEC Section 180(c) Topic Group, discussions with the national and regional organizations described above, and other stakeholder interactions, DOE received valuable comments and views on 180(c) issues which have been considered in the development of this revised proposed policy. The Topic Group reached significant agreement on eligibility requirements and timing of the grants and allowable uses of the funding.

This policy is intended to be consistent with Homeland Security Presidential Directives Number 5, "Management of Domestic Incidents," issued February 28, 2003, and Number 8, "National Preparedness," issued December 17, 2003; the Department of Homeland Security's National Preparedness Goal, issued December 2005; the National Preparedness Guidance issued April 27, 2005; the National Incident Management System, issued March 1, 2004; and the National Response Plan, issued December 2004.

III. Policy

Policy Statement

Section 180(c) of the NWPA states:

> The Secretary [of DOE] shall provide technical assistance and funds to States for training for public safety officials of appropriate units of local government and Indian tribes through whose jurisdiction the Secretary plans to transport spent nuclear fuel or high-level radioactive waste under subtitle A or under subtitle C. Training shall cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations.

This proposed policy addresses the provision of technical and financial assistance for training, both for normal transportation operations and for potential incidents that may require emergency response during shipments of spent nuclear fuel or high-level radioactive waste to an NWPA-authorized facility. Technical assistance to support 180(c) activities will consist of non-monetary assistance that the Secretary of Energy can provide from DOE's specific knowledge, expertise, and existing resources to aid training of public safety officials on procedures for safe routine transportation and for emergency response situations during the transport of spent nuclear fuel and high-level radioactive waste to an NWPA-authorized facility. Technical assistance includes, but is not limited to, access to DOE's regional and Headquarters representatives involved in the planning and operation of NWPA transportation or emergency preparedness activities, provision of information packets that include materials about the OCRWM Program and shipments, and provision of other training materials and information. Financial assistance will consist of assessment and planning grants and annual training grants. The provision of grants will be subject to the criteria described herein, as well as the availability of appropriated funds.

This revised proposed policy is consistent with DOE's longstanding commitment to meet or exceed requirements and standards applicable to the transport of spent nuclear fuel and high-level radioactive waste; to cooperate with States, Tribes, and local governments; and to make use of the existing expertise of States, Tribes, and local governments to the maximum extent practicable.

Section 180(c) funds are intended to be used for training specific to shipments of spent nuclear fuel and high-level radioactive waste to an NWPA-authorized facility. DOE will work with States and Tribes to evaluate current preparedness for safe routine transportation and emergency response capability and will provide funding as appropriate to ensure that State, Tribal, and local officials are prepared for OCRWM shipments. Section 180(c) funds and related training are intended to supplement but not duplicate existing training for safe routine transportation and emergency preparedness. DOE will work with States and Tribes to coordinate and integrate Section 180(c) activities with existing training programs designed for State, Tribal, and local public safety officials. Equipment purchased with Section 180(c) funds is intended to be used for training to prepare for the specific hazards presented by shipments to an NWPA-authorized facility. If necessary, such equipment could then be used for inspections and for responding to emergencies. Since State and Tribal governments have primary responsibility to protect the public health and safety in their jurisdictions, they will have flexibility to decide which allowable activities to request Section 180(c) assistance to meet their unique needs within the limits of the NWPA and DOE and other Federal financial assistance regulations and restrictions.

Training with Section 180(c) funds should be to the level of detail and to the degree necessary to prepare for shipments to an NWPA-authorized facility. When necessary or appropriate, training should be consistent with the Occupational Safety and Health Administration (OSHA) awareness or operations levels, as those terms are defined in 29 CFR 1910.120, and the jurisdiction's emergency response plans. Any deficiency in basic emergency response capability may be addressed through consultation and technical assistance.

Funding Mechanism

DOE will implement Section 180(c) by funding direct grants to eligible States and Tribes. The grants program will be administered in accordance with the DOE Financial Assistance rules (10 CFR part 600), which implement applicable Office of Management and Budget circulars, and applicable law. The grant application process will require States and Tribes to describe and justify their proposed work in the format of a five-year project with a more detailed two-year work plan. Applications will only be accepted through the Federal government's electronic grant application system at *www.grants.gov.*

Basis for Cost Estimate/Grant Funding Allocation to States

DOE anticipates providing funds to States in accordance with the approach described below. Specifically, DOE expects to make two grants available to States: An assessment and planning grant and an annual training grant.[2]

The assessment and planning grant to each eligible State will support an initial needs assessment to identify training needs that might be addressed in future training grants to that State. The amount of the assessment and planning grant is not expected to exceed $200,000, adjusted annually for inflation, for each eligible State based on appropriated funds available for that purpose in a particular fiscal year. The annual training grant to each eligible State will support allowable activities as specified in the grant. The annual training grant for each eligible State will consist of a base amount not expected to exceed $100,000, adjusted annually for inflation, as well as a variable amount. The base amount for each grant depends on Congressional appropriations. DOE selected the amounts of the base grants based on experience with similar training programs and discussions with State and emergency response officials about the scope of work likely for each grant.

The variable amount of the training grant will be determined through a risk-based formula using the factors of population along routes, route miles,

[2] DOE has recently begun meeting with Indian Tribes to discuss the funding allocation options for grants to Tribes. The proposed funding allocation approach described herein applies only to States.

number of shipments, and shipping sites. The population figure, calculated from U.S. Census Bureau data, acts as a surrogate for either the number of responders requiring training or the number of jurisdictions requiring training. Total route miles (for all shipping modes) acts as a surrogate for the accident risk. The number of shipments addresses the additional burden placed on States that are heavily impacted by shipments. Finally, the number of shipping sites will factor in the additional training burden placed on States that must prepare for point-of-origin inspections of both the package and the vehicle. Shipping sites will include commercial nuclear power plants, DOE sites, and any other entity shipping spent nuclear fuel or high-level radioactive waste to an NWPA-authorized facility.

The amount of the annual training grants will be based on the appropriated funds available for that purpose in a particular fiscal year. Available funds will be first used to fund the base portion of the grant, which would be the same for each eligible State. Remaining available funds will be used to fund the variable portion of the grant for each eligible State on the basis of the following five-step formula.

The steps are as follows:

Step 1: Collect raw data with respect to the factors of population along routes, route miles, number of shipments, and shipping sites for each State.

Step 2: Divide the raw State data for each factor by the national total for each factor. The result is each State's percentage of the national total for each factor.

Step 3: Multiply each State's percentage of each factor by the correspondent weighting for each factor as specified below; the result would be summed to reach a total for each State, as follows:

0.3 × Percentage of Population Along Route Corridors
+ 0.3 × Percentage of Route Miles
+ 0.3 × Percentage of Number of Shipments
+ 0.1 × Percentage of Shipping Sites
= Total for Each State

Step 4: Sum the total for each State to obtain a national total.

Step 5: Divide each State's total by the national total to reach each State's percentage of available funds for the year.

DOE will work with applicants to ensure consistent sources are used to estimate the raw data for each factor of the formula. All factors are specific to the shipping year. The specific sources DOE will use for the raw data are as follows:

- The population factor will be calculated using the population within 2,500 meters of the route as calculated by the Transportation Routing Analysis Geographic Information System (TRAGIS), DOE's routing model. TRAGIS uses U.S. Census Bureau data as its source for population.
- For route miles, DOE will calculate the national total using TRAGIS to estimate the route miles for each year's projected shipments.
- The number of shipments annually through a State will be estimated based on DOE's projected shipments for each year.
- The number of shipping sites will be based on the number of defense and civilian sites originating a shipment within the State for the year for which an applicant is applying for funding.

Eligibility and Timing of the Grants Program

DOE will provide grants and technical assistance to those States and Tribes through whose jurisdictions the Secretary of Energy plans to transport spent nuclear fuel and high-level radioactive waste to an NWPA-authorized facility. Where a route constitutes a border between two States, a State and a Tribal reservation, or two Tribal reservations, every jurisdiction with emergency response responsibility and inspection authority over the route will be eligible for Section 180(c) assistance. If a State or Tribe will *not* have shipments but has cross-deputization or mutual aid agreements with a jurisdiction that *will* have shipments, the non-shipment jurisdiction may work with DOE to receive funding.

DOE will send a letter to the Governor or Tribal leader's office notifying them of their State or Tribe's eligibility to apply for Section 180(c) grants approximately five years before shipments are scheduled through that State or Tribe's jurisdiction. Each State or Tribe shall designate which agency or staff member of the State or Tribe will administer its Section 180(c) grants. Subsequently, DOE will communicate with the State or Tribe's designated agency or staff person regarding Section 180(c) grants.

Subject to the availability of appropriated funds, DOE expects to begin making assessment and planning grants available to a State or Tribe approximately four years prior to the first shipment to an NWPA-authorized facility through that State or Tribe's jurisdiction.

DOE intends to issue training grants in each of the three years prior to a scheduled shipment through a State or Tribe's jurisdiction and every year that shipments are scheduled.

Allowable Activities

DOE intends to allow a broad array of eligible planning and training activities, thus providing the recipients flexibility to direct funds toward their individual needs. DOE will require applicants to describe and justify the need for proposed activities, training, and purchases in the application package for review and approval by DOE.

Under Section 180(c) of the NWPA, DOE shall provide technical and financial assistance to States and Indian Tribes through whose jurisdictions the DOE plans to transport spent nuclear fuel or high-level radioactive waste to an NWPA-authorized facility. States and Tribes should describe in their grant applications how the grants will be used to provide training to local public safety officials. States and Tribes are expected to coordinate with local public safety officials during the assessment and planning phase and in developing their applications for the annual training grants. DOE recognizes that, depending on the State or Tribe, the role of local public safety officials in responding to incidents involving radioactive materials varies from a minimal role of crowd and traffic control to the primary role of incident command. Therefore, the benefit to local public safety officials should be consistent with established State, Tribal, and local roles in dealing with routine transportation and in responding to an incident involving NWPA shipments.

Potential activities for the Assessment and Planning Grant include:

- Assessment of the jurisdiction's needs for training on procedures related to safe routine transportation and emergency response situations.
- Development of mutual aid agreements among neighboring jurisdictions and with Federal agencies.
- Planning for how to provide needed training for public safety officials.
- Participation in DOE, regional, and national transportation planning meetings.
- Intra- and interstate and Tribal planning and coordination.
- Support for exercises to test plans and training.
- Review of DOE transportation, emergency management, communications, and security plans, including threat assessments and civil disobedience/law enforcement planning.
- Obtaining access to DOE data and systems, such as the Transportation Tracking and Communications system

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(TRANSCOM) for information and shipment tracking.

- Evaluation and identification of alternative routes for DOE non-classified radioactive materials shipments according to 49 CFR 397, *Transportation of Hazardous Materials' Driving and Parking Rules* (referred to as HM–164).
- Risk assessments.
- Participation in DOE's Transportation Emergency Preparedness Program (TEPP).[3]
- Coordination with DOE's Radiological Assistance Program (RAP) training, exercises, and planning activities.[4]
- Planning activities using Transportation Routing Analysis Geographic Information System (TRAGIS) or other DOE route or risk assessment models.
- Participation in carrier evaluation programs that may be implemented through other agencies or organizations.
- Staff costs related to planning and needs assessments.

The Training Grant has two categories of allowable activities: Activities related to safe routine transportation and activities related to emergency response.

Activities for the safe routine transportation aspects of the Training Grant may include:

- Continuation of the activities initiated under the Assessment and Planning Grant, such as coordination with agencies within the State or Tribe, assessment of training needs, and assessment of technical assistance needs.
- Training and staff costs associated with the Department of Transportation's State Rail Safety Participation Program. The Federal Railroad Administration will provide informal outreach and training opportunities to Tribal nations, since there is no statutory authority for participation by Indian Tribes in the State Safety Participation Program as outlined in 49 CFR 212.
- Training for public safety officials in safety and enforcement inspections of highway shipments (drivers, vehicles, and shipping containers).
- Training related to accident prevention (e.g., for safe parking, bad weather, and road conditions).
- Training for appropriate local, State, and Tribal officials on the proper handling of information and documents, including secure and confidential shipments.
- Training for radiological inspections, both rail and truck.
- Training on a satellite tracking system.
- Equipment purchases, calibration, and maintenance for training purposes.[5]
- Staff costs related to training.

Activities for the emergency response aspects of the Training Grant may include:

- Continuation of planning activities begun under the Assessment and Planning Grant.
- Training in implementation of mutual aid agreements among neighboring jurisdictions and agreements with Federal agencies.
- Training for public safety officials in hazardous materials emergency response procedures. When necessary or appropriate, training should be consistent with OSHA awareness or operations levels, as those terms are defined in 29 CFR 1910.120, and the jurisdiction's emergency response plans.
- Participation in DOE's TEPP.
- Equipment purchases, calibration, and maintenance for training purposes.
- Training for emergency medical personnel, including hospital emergency medical personnel.
- Designing, conducting, and evaluating drills and exercises, including the implementation of mutual aid agreements and emergency response plans and procedures.
- Staff costs related to training.

IV. Merit Review Criteria

States and Tribes will have flexibility to decide for which allowable activities to request Section 180(c) assistance to meet their unique needs within the limits of the NWPA and DOE and other Federal financial assistance regulations and restrictions. Grant applications will be reviewed in accordance with 10 CFR 600.13, *Merit Review*.

The merit review process consists of a board of technically qualified reviewers who evaluate each grant application on pre-established criteria. The merit review board advises the DOE's selection officials as to the merits of each proposed activity and the overall quality of the application. The DOE's selection officials will make final funding determinations and notify successful applicants of their award in accordance with standard grant procedures.

The proposed criteria, which the merit review board will use for its review, are described below in *Table 1. Assessment and Planning Grant and Table 2. Training Grant.* The applicant's narrative should address each of these criteria in accordance with the instructions provided.

TABLE 1.—ASSESSMENT AND PLANNING GRANT

Criteria	Instructions
Conduct a needs assessment and develop a training plan to prepare for NWPA shipments through the applicant's jurisdiction.	In the grant application narrative, make sure the scope of the assessment and plan development is clear and thorough: a. Describe how the State or Tribe will assess needs, including how the State or Tribe will determine what additional planning, training, equipment, and exercises may be needed. b. Describe the technical assistance that will be requested from DOE or other Federal agencies in order to conduct the needs assessment. c. Describe the cost and timeframe of each proposed assessment and planning activity. d. Describe what planning will occur within the State or Tribe and with local jurisdictions. e. Identify all mutual aid agencies that will be contacted to complete the needs assessment and training plan. f. Describe how the proposed grant funding does not supplant or duplicate existing funding from Federal or State sources.

[3] DOE's TEPP integrates transportation emergency preparedness activities for DOE non-classified shipments of radioactive materials to address the emergency response concerns of State, Tribal, and local officials affected by such shipments. TEPP is implemented on a regional basis, with a TEPP Coordinator for each region. TEPP ensures responders have access to the model plans and procedures, training, and technical assistance necessary to respond safely, efficiently, and effectively to transportation incidents.

[4] DOE's RAP is a team of DOE and DOE contractor personnel specifically trained to perform radiological emergency response activities. The RAP teams may deploy at the request of DOE sites; other Federal agencies; State, Tribal or local governments; or from any private organization or individual. Teams are located at eight sites around the Nation.

[5] Grant funds can be used to purchase equipment for training purposes. They can also be used to calibrate and maintain equipment as long as the equipment is training-related and specific to the needs created by the NWPA shipments.

TABLE 1.—ASSESSMENT AND PLANNING GRANT—Continued

Criteria	Instructions
Prepare public safety officials of appropriate units of local government.	The narrative should completely and accurately describe: a. How local public safety officials were involved in developing the grant application. b. How local public safety officials will be involved in the needs assessment consistent with their role in radioactive/hazardous materials transportation as defined by the State.
Prepare sufficiently to reassure the public of adequate preparedness.	The narrative should accurately and completely describe: a. How the applicant will assess what is needed to respond to inquiries from the public and the media. b. What activities and measures, if any, are needed to reassure the public of adequate preparedness.
Train for the increment of need specific to NWPA shipments.	The narrative should accurately and completely describe: a. What the applicant is already doing to prepare for radioactive materials shipments. b. How each proposed needs assessment activity is specific to the NWPA shipments.

TABLE 2.—TRAINING GRANT

Criteria	Instructions
Conduct training on procedures for safe routine transportation to help prevent accidents and respond in a timely and appropriate fashion to incidents involving NWPA shipments.	The narrative should accurately and completely describe: a. How many public safety officials will be trained and what training they will receive, based on the needs assessment conducted under the Assessment and Planning Grant. b. List the equipment the applicant proposes to purchase, describe why this equipment is necessary for training for these shipments, and how it is consistent with the training level to which the responders will be trained. c. How the proposed grant funding does not supplant or duplicate existing funding from Federal or State sources. d. How the actions listed in this section help the applicant increase its capability to prevent accidents and respond appropriately to accidents. e. The technical assistance that will be requested from DOE, either from OCRWM, RAP teams, TEPP coordinators, or other Federal agencies. f. How the training and technical assistance will be integrated with assistance received from other Federal Government sources.
Help prepare public safety officials of appropriate units of local government.	The narrative should accurately and completely describe: a. How local public safety officials will benefit from the proposed activities. b. Whether those local public safety officials support the activities proposed in this application and how their level of support is determined.
Prepare sufficiently to reassure the public of adequate preparedness.	The narrative should accurately and completely describe: a. How the applicant will train to respond to inquiries from the public and the media. b. What activities and measures, if any, will be taken to reassure the public of adequate preparedness.
Train in the increment of need specific to NWPA shipments.	The narrative should accurately and completely describe: a. How each proposed activity is specific to the NWPA shipments. b. How the training will be integrated with assistance received from other DOE programs or Federal agencies for radioactive materials transportation preparedness.
Assess level of preparedness after training, exercises, and technical assistance.	The narrative should accurately and completely describe: a. How the applicant will assess their level of preparedness after conducting the proposed activities. The proposed assessment should measure readiness against the objectives described in the applicant's project narrative. b. How the applicant will assess how well it utilized the technical assistance requested.

V. Request for Comments

DOE requests that interested parties comment on this notice of revised proposed policy, including the specific questions identified below:

Question 1

(a) Would $200,000 be an appropriate amount for the assessment and planning grant to conduct an initial needs assessment?

(b) Should the amount be the same for each eligible State and Tribe?

(c) Would there be a need to update the initial needs assessment and, if so, at what intervals and should funding be made available for this purpose and in what amount?

Question 2

(a) Would $100,000 be an appropriate amount for the annual training grant?

(b) Recognizing that, after commencement of shipments through an eligible State or Tribe, training to maintain capability may become less costly with increased expertise and efficiency, should the base amount of subsequent annual training grants be adjusted downward to reflect the number of years that annual training grants have been received?

(c) What should be the allocation of available appropriated funds for a fiscal year between the base amount and the variable amount of the annual training grants?

(d) Should the entire training grant be variable based on the funding allocation formula described herein?

Question 3

(a) Should the amount of funding be adjusted where a route forms a border between two States, a State and a Tribal reservation, or two Tribal reservations?

(b) Should States or Tribes with mutual aid responsibilities along a route outside their borders be eligible for

180(c) grants on the basis of the mutual aid agreement?

(c) If so, how should the amount of funding be calculated, and should the calculation take into account whether or not the State or Tribe would otherwise be eligible for a grant?

(d) Should the State or Tribe that received notification of eligibility from DOE indicate in their grant application that a neighboring State or Tribe has a mutual aid agreement along a particular route, whereupon DOE would then notify the neighboring State or Tribe of its eligibility?

Question 4

(a) Do assessment and planning grants need to be undertaken four years prior to an initial scheduled shipment through a State or Tribe's jurisdiction?

(b) Do training grants need to commence three years prior to a scheduled shipment through a State or Tribe's jurisdiction?

(c) Do training grants need to be provided every year that shipments are scheduled?

Question 5

(a) Should the Section 180(c) grants be adjusted to account for fees levied by States or Tribes on the transportation of spent nuclear fuel or high-level radioactive waste through their jurisdiction?

(b) How should DOE determine if a fee covers all or part of the cost of activities allowed under Section 180(c) grants?

(c) Is the language in this policy, requiring States and Tribes to explain in their grant application how the fees and Section 180(c) grant awards are separate and distinct, sufficient to prevent DOE from paying twice for the same activity?

Question 6

(a) How should Section 180(c) grants be adjusted to reflect other funding or technical assistance from DOE or other Federal agencies for training for safe routine transportation and emergency response procedures?

(b) In particular, how should DOE account for TEPP and other similar programs that provide funding and/or technical assistance related to transportation of radioactive materials?

(c) To what extent is Section 180(c) funding necessary where funding and/or technical assistance are being or have been provided for other DOE shipping campaigns such as to DOE's Waste Isolation Pilot Plant?

Issued in Washington, DC, on July 18, 2007.

Edward F. Sproat III,

Director, Office of Civilian Radioactive Waste Management.

[FR Doc. E7–14181 Filed 7–20–07; 8:45 am]

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APPENDIX B

INTERAGENCY AND INTERGOVERNMENTAL INTERACTIONS

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APPENDIX B

INTERAGENCY AND INTERGOVERNMENTAL INTERACTIONS

This appendix describes DOE interagency and intergovernmental interactions during the preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS.

During the preparation of the Nevada Rail Corridor SEIS and the Rail Alignment EIS, the U.S. Department of Energy (DOE or the Department) has interacted with a number of government agencies and other organizations. These interaction efforts have several purposes, as follows:

- To discuss issues of concern with organizations having an interest in or authority over land that the Proposed Action would directly affect, or organizations having other interests that some aspect of the Proposed Action could affect
- To obtain information pertinent to the environmental impacts analyses
- To initiate consultations or permitting processes, including providing data to agencies with oversight, review, or approval authority over some aspect of the Proposed Action

Sections B.1 through B.7 describe agency and organization interests in the proposed railroad project and DOE consultations and interactions with those agencies and organizations.

B.1 Cooperating Agencies

The Bureau of Land Management (BLM or the Bureau), the Surface Transportation Board (STB), and the U.S. Air Force are cooperating agencies in the preparation of the Rail Corridor SEIS and the Rail Alignment EIS, pursuant to Council on Environmental Quality regulations at 40 Code of Federal Regulations 1501.6.

B.1.1 BUREAU OF LAND MANAGEMENT

DOE met routinely with the BLM to discuss project direction and coordination. DOE has held numerous briefings and working meetings with the BLM, including staff from the Tonopah, Ely, Battle Mountain, Las Vegas, Reno, and Carson City BLM field offices, regarding the status of the National Environmental Policy Act (NEPA) analyses. Table B-1 summarizes major DOE interactions with the BLM. In addition, a BLM staff member resided in DOE offices during the development of the Nevada Rail Corridor SEIS and the Rail Alignment EIS to facilitate communications and interactions between DOE and the BLM.

B.1.2 SURFACE TRANSPORTATION BOARD

The U.S. Department of Transportation has the authority to regulate several aspects of the transportation of spent nuclear fuel and high-level radioactive waste to the repository. The general authority of the U.S. Department of Transportation to regulate carriers and shippers of hazardous materials includes packaging procedures and practices, shipping of hazardous materials, routing, carrier operations, shipping container instruction, and receipt of hazardous material.

Table B-1. Summary of DOE interactions with the BLM[a] (page 1 of 2).

Date	Office	Summary of interaction
07/14/04	DOE Las Vegas	Discussed the schedule for preparation of the Rail Alignment EIS and reviewed the preliminary scope and outline for the EIS
12/02/04	DOE Las Vegas	Reviewed the nature of the Proposed Action and alternatives (including alternative segments) and the locations of railroad construction and operations support facilities for purposes of analysis
12/14/04	BLM Ely	• Obtained initial information for biological surveys and physical setting • Discussed unique natural features; soil surveys; BLM special status species; fencing; grazing allotments; wetlands; and various wildlife species
12/15/04	BLM Tonopah	• Obtained initial information for biological surveys and physical setting • Discussed soil surveys; invasive species; wetlands; BLM special status species; fencing; grazing allotments; wetlands; and various wildlife species
01/03/05	BLM Las Vegas	Obtained and discussed BLM input on key observation points for aesthetics analysis
01/04/05	BLM Ely	Obtained and discussed BLM input on key observation points for aesthetics analysis
01/06/05	BLM Battle Mountain	Obtained and discussed BLM input on key observation points for aesthetics analysis
02/08/05	BLM Tonopah	• Discussed fencing, land segregation, invasive species, and land-use conflicts • Identified potential activities to be considered in the Shared-Use Option and the cumulative impact analysis
02/16/05	BLM Las Vegas	• Provided an overview of proposed rail alignment and alternative actions for BLM • Learned of BLM concerns
03/17/05	DOE Las Vegas	Discussed the approach for addressing mitigation measures
04/06/05	BLM Ely	Discussed caves, paleontology, and unique natural features
04/06/05	BLM Las Vegas	Formal presentation to BLM on the Rail Alignment EIS to review historical perspective; discuss decisions supported by the EIS; the Proposed Action and alternatives; use of conceptual design information; approaches to analyzing resources; land acquisition; and schedule
04/12/05	DOE Las Vegas	Discussed the approach for addressing mitigation measures and a preferred alignment
04/21/05	BLM Las Vegas	Reviewed the approach for land acquisition; discussed economic or value assessment of mineral resources and ore bodies
05/18/05	BLM Las Vegas	• Provided an update regarding the Rail Alignment EIS • Discussed BLM concerns • Presented and discussed approach to analysis of cumulative impacts
05/24/05	BLM Ely	• Discussed availability of mapping of visual resource management classifications, and the record of decision for Caliente Management Framework • Planned for and discussed the upcoming Resource Management Plan for the Garden Valley area

Table B-1. Summary of DOE interactions with the BLM[a] (page 2 of 2).

Date	Office	Summary of interaction
05/26/05	BLM Battle Mountain	• Coordinated use of BLM geographical information system data
06/07/05	BLM Ely	• Provided an update regarding the Rail Alignment EIS • Learned of BLM Resource Management Plan update and identified projects that should be included in the Rail Alignment EIS • Discussed Rail Alignment EIS cumulative impact analysis
06/22/05	BLM Tonopah	• Provided an update regarding the Rail Alignment EIS
06/29/05	BLM Battle Mountain	• Provided an update regarding the Rail Alignment EIS
02/07/06-02/08/06	DOE Las Vegas	• Presented the DOE preferred alternative segments and received input from cooperating agencies
03/14/06-3/16/06	BLM Ely	• Draft EIS workshop to discuss Proposed Action and potential impacts
11/28/06	BLM Reno	• Provided an update regarding the Nevada Rail Corridor SEIS and the Rail Alignment EIS
2/13/07	BLM Carson City	• Provided an update regarding the Nevada Rail Corridor SEIS and the Rail Alignment EIS

a. BLM = Bureau of Land Management; DOE = U.S. Department of Energy; EIS = environmental impact statement; SEIS = supplemental environmental impact statement.

During the preparation of the NEPA analyses, DOE met routinely with the STB to discuss project direction and coordination. The STB:

- Participated in a meeting on July 14, 2004, to discuss the Rail Alignment EIS preparation schedule and to review the preliminary scope and outline of the EIS
- Participated in a meeting on December 2, 2004, to review the nature of the Proposed Action and alternatives (including alternative segments) and to review the proposed locations of construction and operations support facilities for purposes of analysis
- Received a formal presentation from DOE on March 16, 2005, to review the proposed Caliente rail alignment alternative segments, use of conceptual design information, framework of the Shared-Use Option, and approaches to analyzing various environmental resources
- Participated in a meeting on April 12, 2005, to discuss the approach for addressing mitigation measures and a preferred alignment along the Caliente rail corridor and to review the approach for acquiring land
- Provided, on April 19, 2005, input regarding the extent to which truck traffic carrying general commodities should be evaluated under the No-Action Alternative
- Participated in a 2-day meeting on February 7 and 8, 2006, to discuss the DOE preferred alternative segments along the Caliente rail alignment

B.1.3 U.S. AIR FORCE

The U.S. Air Force participated in a meeting on July 14, 2004, to discuss the NEPA document preparation schedule and to review the preliminary scope and outline of the Rail Alignment EIS, and a 2-day meeting on February 7 and 8, 2006, to discuss the DOE preferred alternative segments along the Caliente rail alignment.

B.1.4 U.S. ARMY

The U.S. Army has participated in the following meetings:

- December 23, 2006, to discuss the status of document preparation, and the inclusion of the Mina rail alignment as part of the NEPA analysis
- January 8, 2007, to discuss rail alignment infrastructure in relation to the U.S. Army-established safety zones around munitions storage areas
- February 19, 2007, to discuss the location and use of switching yards from the existing U.S. Department of Defense Branchline

B.2 Other Federal Agencies

B.2.1 U.S. DEPARTMENT OF THE INTERIOR

The U.S. Department of the Interior is responsible for most federally owned public lands and natural resources. Department of the Interior activities potentially affected by the Proposed Action include managing lands and resources, conducting scientific research and investigations, developing resources, and carrying out trust responsibilities of the U.S. Government with respect to American Indians. The Department of the Interior oversees various bureaus with jurisdictional responsibilities or interests that would be affected by the proposed railroad, including the Bureau of Indian Affairs, the Bureau of Land Management, and the U.S. Fish and Wildlife Service.

The Bureau of Indian Affairs is responsible for administering and managing land held in trust by the United States for American Indians, Indian tribes, and Alaska Natives. The Bureau of Indian Affairs is responsible for developing forestlands, leasing assets on these lands, directing agricultural programs, protecting water and land rights, developing and maintaining infrastructure, and economic development.

On September 20, 2004, DOE responded to a letter from the Bureau of Indian Affairs, indicating that the Department had eliminated one Caliente alternative segment from further consideration based on the Bureau's concern that it would cross lands held in trust for the Timbisha Shoshone Tribe (DIRS 174558-Sweeney 2004, all).

Under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended, the U.S. Fish and Wildlife Service, a bureau of the U.S. Department of the Interior, has responsibility to determine if projects such as the proposed railroad would have an adverse impact on endangered or threatened species, on species proposed for listing as endangered or threatened, or on designated critical habitat.

- DOE met with staff from the U.S. Fish and Wildlife Service on January 27, 2005, March 2, 2006, and December 13, 2006, to introduce the project; discuss compliance with the Endangered Species Act; and consider potential impacts to threatened and endangered species.
- On April 12, 2006, representatives of the U.S. Fish and Wildlife Service and DOE visited the Caliente area to evaluate habitat for southwestern willow flycatchers and discuss impacts to that endangered species.

- On March 18, 2005, the U.S. Fish and Wildlife Service sent DOE a list of threatened and endangered species and candidate species that occur in the region of influence of the Caliente rail alignment (DIRS 174439-Williams 2005, all).
- On December 13, 2006, and April 11, 2007, DOE met with staff from the U.S. Fish and Wildlife Service Reno Office to discuss compliance with the Endangered Species Act and requested a list of endangered species that occur in the Mina rail alignment region of influence.
- On March 8, 2007, the Fish and Wildlife Service sent DOE a species list for the Mina rail alignment and an updated list for the Caliente rail alignment.

B.2.2 U.S. ARMY CORPS OF ENGINEERS

The Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*) gives the U.S. Army Corps of Engineers permitting authority over activities that discharge dredge or fill material into Waters of the United States. If DOE activities associated with the proposed railroad would discharge dredge or fill into any such waters, the Department might need to obtain a permit from the U.S. Army Corps of Engineers.

On November 4, 2004, March 7, 2006, November 27, 2006, and March 5, 2007, DOE met with the U.S. Army Corps of Engineers to provide an overview of the plans for constructing a rail line to Yucca Mountain along the Caliente rail alignment and to obtain initial information from the U.S. Army Corps of Engineers on the permitting process for Section 404 of the Clean Water Act. At these meetings, DOE and the Corps of Engineers discussed the required state permits; Corps of Engineers jurisdiction over isolated waters; the type of permit DOE would have to obtain; content and timing of the permit application; potential mitigation; the addition of the Mina rail alignment and related construction plans; and compliance with the National Environmental Policy Act.

B.2.3 U.S. DEPARTMENT OF AGRICULTURE

The U.S. Department of Agriculture is responsible for ensuring that the potential for federal programs to contribute to unnecessary and irreversible conversion of farmlands to nonagricultural uses is kept to a minimum.

On March 9, 2007, DOE sent a letter to the Natural Resources Conservation Service requesting that the Service identify prime farmland along the Caliente and Mina rail alignments.

B.3 State of Nevada

If DOE decided to construct the proposed railroad along the Caliente rail alignment or the Mina rail alignment, the Department would need to obtain a range of permits and approvals from the State of Nevada (Rail Alignment EIS, Chapter 6, Statutory, Regulatory, and Other Applicable Requirements).

- On March 23, 2005, DOE met with personnel from the Nevada Department of Wildlife to identify information that they had regarding wildlife and sensitive animal species that could be included in the Rail Alignment EIS. Various species were discussed, as was fencing along the Caliente rail alignment. DOE had numerous informal follow-up meetings and conversations with the Nevada Department of Wildlife occurred to coordinate sharing of wildlife information.
- On March 23, 2005, DOE met with personnel from the Nevada Division of Forestry to identify pertinent information to be used in the Rail Alignment EIS. The Division of Forestry provided direction regarding where to obtain pertinent information.

- On December 20, 2005, DOE met with personnel from the Nevada Department of Transportation to introduce DOE plans for constructing a rail line to Yucca Mountain along the Caliente rail alignment and to inquire about standards or requirements for road upgrades/improvements, requirements for grade-crossing protection, anticipated improvement projects, and other related topics.
- On January 10, 2006, DOE met with the Nevada Bureau of Air Quality concerning air quality permits and the Rail Alignment EIS. The purpose of the meeting was to present to the Bureau a general overview of the Nevada Rail Project, and a description of air quality permitting that will be included in this EIS.
- On November 31, 2006, and December 18, 2006, DOE met with the Nevada Division of Water Resources to discuss water appropriations for construction and operation of the proposed railroad along the Caliente rail alignment and the process for developing and submitting permit applications.

B.4 Federal and State Agencies Consulted Jointly

DOE, the Advisory Council on Historic Preservation, the Nevada State Office of Historic Preservation, the BLM, and the STB held numerous meetings during 2005 and 2006 to develop a Programmatic Agreement (see Appendix M) to address DOE responsibilities under Sections 106 and 110 of the National Historic Preservation Act and the Council's implementation regulations. The Programmatic Agreement provides that an appropriate level of field investigation, including on-the-ground intensive surveys, evaluations of all recorded resources in the *National Register of Historic Places*, assessments of adverse effects, and applicable mitigation of identified impacts, be completed prior to commencement of any ground-disturbing construction activities (DIRS 176912-Wenker et al. 2006, all). Cultural resource requirements for the segment of the rail alignment and the Rail Equipment Maintenance Yard and geologic repository operations area interface inside the Yucca Mountain Site boundary are covered by the existing programmatic agreement for *Development for the Nuclear Waste Deep Geologic Repository at Yucca Mountain, Nevada* (DIRS 104558-DOE 1988, all) between the DOE Office of Civilian Radioactive Waste Management, the Advisory Council on Historic Preservation, and the Nevada State Office of Historic Preservation.

Although not a formal signatory, the Nevada State Historic Preservation Officer has the right at any time, on request, to participate in monitoring DOE compliance with the Programmatic Agreement. In addition, DOE must provide opportunities for consultations with the Advisory Council on Historic Preservation, the Nevada State Historic Preservation Officer, the BLM, the STB, and American Indian tribes as appropriate throughout the process of implementing the Programmatic Agreement. DOE will submit an annual report to the Advisory Council, the Nevada State Historic Preservation Officer, the BLM, and the STB describing the activities it conducts each year to implement the stipulations of the Programmatic Agreement. DOE will continue to seek input from the Advisory Council on Historic Preservation, the Nevada State Historic Preservation Officer, the BLM, and the STB and will interact appropriately to meet the reporting and other stipulations of the Programmatic Agreement.

B.5 Local Agencies

Units of local government that would be affected by construction and operation of the proposed railroad along the Caliente rail alignment include Lincoln, Nye, and Esmeralda. These counties and the City of Caliente have formed the Central Nevada Community Protection working group to address, in a collaborative effort, issues of concern to their communities related to the Proposed Action.

Under a Cooperative Agreement with DOE, Nye County conducted a mail survey to property owners along or near the Caliente rail alignment to obtain their concerns and thoughts on potential mitigation measures (DIRS 182923-DOE 2003, all). Also under the Cooperative Agreement with DOE, the Nye County Department of Natural Resources and Federal Facilities conducted an assessment of the potential economic benefits of the proposed railroad to Lincoln, Nye, and Esmeralda Counties (DIRS 174090-Wilbur Smith Associates 2005, all).

DOE has interacted with Esmeralda, Lincoln, and Nye Counties and the City of Caliente on a regular basis throughout the preparation of this Nevada Rail Corridor SEIS and the Rail Alignment EIS. For example:

- On March 23, 2005, DOE conducted an all-day project status meeting with the affected units of government, which includes Inyo, Churchill, Esmeralda, Nye, Mineral, White Pine, Lincoln, Clark, Lander, and Eureka Counties. Each county provided an oversight activity report.
- On May 24, 2005, DOE provided an annual program update to the Lander County Commissioners.
- On January 9, 2007, DOE met with Nye County to provide an update on the Nevada Rail Corridor SEIS and the Rail Alignment EIS.
- On January 12, 2007, DOE met with Mineral, Churchill, Esmeralda, and Nye Counties to discuss potential economic opportunities that would be associated with the Shared-Use Option.
- On February 2, 2007, DOE met with the Nye County Economic Development representatives to discuss the potential location of an industrial park the county is considering building near the Yucca Mountain Repository.
- On February 26, 2007, DOE met with Lincoln, Mineral, Nye, and Esmeralda Counties to discuss potential water appropriations applications that would be required to construct and operate the proposed railroad.

B.6 American Indian Tribes

In 1987, DOE initiated the Native American Interaction Program to solicit input from and interact with tribes and organizations on the characterization of the Yucca Mountain site and the possible construction and operation of a repository. These tribes and organizations - Southern Paiute; Western Shoshone; and Owens Valley Paiute and Shoshone people from Arizona, California, Nevada, and Utah - have cultural and historic ties to both the Yucca Mountain area and to the larger region that includes portions of the Caliente and Mina rail alignments.

The Native American Interaction Program concentrates on the protection of cultural resources at Yucca Mountain and contributes to a government-to-government relationship with the tribes and organizations. Its purpose is to help DOE comply with various federal laws and regulations, including the American Indian Religious Freedom Act (42 U.S.C. 1996); the Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*); the National Historic Preservation Act (16 U.S.C. 470 *et seq.*); the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001); the American Indian and Alaska Native Tribal Government Policy; DOE Order 1230.2, *American Indian and Tribal Government Policy*; Executive Order 13007, *Indian Sacred Sites*; and Executive Order 13084, *Consultation and Coordination with Indian Tribal Governments*. These regulations and Executive Orders mandate the protection of archaeological sites and cultural items and require agencies to include American Indians and federally recognized tribes in discussions and interactions on major federal actions.

Initial ethnographic studies identified three tribal groups – the Southern Paiute, the Western Shoshone, and the Owens Valley Paiute and Shoshone – whose cultural heritage includes the Yucca Mountain region. Additional ethnographic efforts eventually led to the involvement of 17 tribes and organizations in the Yucca Mountain Project American Indian and cultural resource studies.

The 17 tribes and organizations have formed the Consolidated Group of Tribes and Organizations (an informal coalition), which consists of officially appointed tribal representatives who are responsible for presenting their respective tribal concerns and perspectives to DOE. A major priority of this group has been the protection of cultural resources and environmental restoration at Yucca Mountain. Members of the group have participated in many ethnographic interviews and have provided DOE valuable insights into American Indian cultural and religious values and beliefs. These interactions have produced several reports that record the regional history of American Indian people and the interpretation of American Indian cultural resources in the Yucca Mountain region.

On June 2, 2004, DOE met with the Consolidated Group of Tribes and Organizations to introduce the rail alignment project and learn of their concerns. In October 2004, a small group of designated tribal representatives participated in a field reconnaissance trip along the proposed rail alignment, followed by a meeting with the larger consolidated group in late November 2004.

Based on these efforts, these tribal representatives known as the American Indian Writers Subgroup, a subgroup of the Consolidated Group of Tribes and Organizations, prepared *American Indian Perspectives on the Proposed Rail Alignment Environmental Impact Statement for the U.S. Department of Energy Yucca Mountain Project* (DIRS 174205-Kane et al. 2005, all). This document provides insight into American Indian viewpoints and concerns regarding cultural resources along the Caliente rail alignment and long-term impacts of DOE selection of a rail system to transport spent nuclear fuel and high-level radioactive waste to a geologic repository at Yucca Mountain, Nevada. This document is a supplement to the American Indian Writers Subgroup document produced in 1998 titled *American Indian Perspectives on the Yucca Mountain Site Characterization Project and the Repository Environmental Impact Statement* (DIRS 102043-AIWS 1998, all).

- In July 2005, DOE held a tribal update meeting with the Consolidated Group of Tribes and Organizations. The rail alignment project and the document prepared by the American Indian Writers Subgroup were topics of discussion.
- In September 2005, DOE held a special meeting with the Consolidated Group of Tribes and Organizations for discussions on the Environmental Assessment associated with the DOE request for a Public Land Order to prevent new mining claims along the Caliente rail corridor study area.
- In April 2006, DOE again met with the American Indian Writers Subgroup for continued discussions and updates on the Caliente rail alignment. After each meeting between DOE and the Consolidated Group of Tribes and Organizations or the designated American Indian Writers Subgroup, the tribal representatives prepared a series of recommendations for DOE consideration.
- On November 29, 2006, DOE met with the Consolidated Group of Tribes and Organization to discuss the inclusion of the Mina rail alignment for analysis in the Nevada Rail Corridor SEIS and the Rail Alignment EIS and to provide an update on analysis of the Caliente rail alignment.

DOE recognized that the Walker River Paiute Tribe, as a sovereign nation, would play a prominent role in the preparation and review of the Nevada Rail Corridor SEIS and the Rail Alignment EIS, because the Mina rail alignment would cross the Walker River Reservation through one of four alternative segments. Before withdrawing from the EIS process in April 2007, the Walker River Paiute Tribe served as a cooperating agency, and participated in several status meetings to discuss the Proposed Action and environmental analyses and document preparation.

B.7 Government Organization Having Oversight of DOE Activities Related to the Proposed Railroad, Nuclear Waste Technical Review Board

The Nuclear Waste Policy Amendments Act of 1987 (42 U.S.C. 10101 *et seq.*) created the 11-member Nuclear Waste Technical Review Board to evaluate DOE scientific and technical activities related to the management and disposal of the Nation's commercial spent nuclear fuel. The Technical Review Board's primary responsibility is to evaluate (1) the site characterization phase of the Yucca Mountain Project and the activities associated with determining whether the Yucca Mountain Site is suitable for further development as a geologic repository, and (2) the packaging and transportation of spent nuclear fuel and high-level radioactive waste.

The mandate of the Nuclear Waste Technical Review Board is to evaluate the scientific and technical work DOE is performing in its commercial nuclear waste disposal program. The Technical Review Board makes scientific and technical recommendations to DOE.

B.8 REFERENCES

102043	AIWS 1998	AIWS (American Indian Writers Subgroup) 1998. American Indian Perspectives on the Yucca Mountain Site Characterization Project and the Repository Environmental Impact Statement. Las Vegas, Nevada: Consolidated Group of Tribes and Organizations. ACC: MOL.19980420.0041.
104558	DOE 1988	DOE (U.S. Department of Energy) 1988. Programmatic Agreement Between the United States Department of Energy and the Advisory Council on Historic Preservation for the Nuclear Waste Deep Geologic Repository Program Yucca Mountain, Nevada. Washington, D.C.: U.S. Department of Energy. ACC: HQX.19890426.0057.
182923	DOE 2003	DOE 2003. Proposed New Cooperative Agreement Number DE-FC28-03RW12223 for Yucca Mountain Transportation Issues and Concerns Unique to the Destination County Memorandum w/enclosures ACC: MOL.20030922.0177.
174205	Kane et al. 2005	Kane, G.; Cornelius, B.; Charles, J.; Moose, G.; Frank-Churchill, M.; and Arnold, R. 2005. American Indian Perspectives on the Proposed Rail Alignment Environmental Impact Statement for the U.S. Department of Energy's Yucca Mountain Project. [Las Vegas, Nevada]: American Indian Writers Subgroup, Consolidated Group of Tribes and Organizations. ACC: ESU.20050707.0001.
174558	Sweeney 2004	Sweeney, R.L. 2004. Response to Bureau of Indian Affairs Letter dated June 18, 2004 Concerning Timbisha Shoshone Tribe and Rail Alignment, Environmental Impact Statement. Correspondence from R.L. Sweeney (DOE/ORD) to A.L. Dutschke (Bureau of Indian Affairs), September 20, 2004, 0921043296, MFR:OSPD:RLS-1755. ACC: MOL.20041129.0011.

176912	Wenker et al. 2006	Wenker, R.; Lanthum, J.G.; Baldrica, A.M.; and Rutson, V. 2006. Programmatic Agreement Among the U.S. Department of Interior Bureau of Land Management, Nevada (BLM); the U.S. Department of Energy (DOE); Surface Transportation Board (STB); and the Nevada State Historic Preservation Office (SHPO) Regarding the Nevada Rail Project (NRP). Agreement that Construction of the NRP Shall be Administered in Accordance with Stipulations in the Agreement to Ensure that Historic Properties Will be Treated to Avoid or Mitigate Effects to the Extent Practicable, Regardless of Surface Ownership, and to Satisfy DOE and BLM Section 106 Responsibilities for All Aspects of the Undertaking. ACC: MOL.20060531.0087.
174090	Wilbur Smith Associates 2005	Wilbur Smith Associates 2005. Final Report, Rail Transportation Economic Impact Evaluation & Planning. Nye County, Nevada: Nye County, Department of Natural Resources and Federal Facilities. TIC: 257526.
174439	Williams 2005	Williams, R.D. 2005. "Species List for U.S. Department of Energy Rail Line from near Caliente, Lincoln County, Nevada to Yucca Mountain, Nye County, Nevada." Letter from R.D. Williams (Nevada Fish and Wildlife Service) to R. Sweeney (DOE), March 18, 2005, File No. 1-5-05-SP-439. ACC: MOL.20050714.0434.

APPENDIX C

EVOLUTION OF ALTERNATIVE SEGMENTS AND COMMON SEGMENTS

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APPENDIX C

EVOLUTION OF COMMON SEGMENTS AND ALTERNATIVE SEGMENTS

This appendix describes the process the DOE used to evaluate and determine the range of alternative segments considered in the Rail Alignment EIS and the results of that process.

Section C.7 defines terms shown in ***bold italics***.

Section C.1 of this appendix describes how the U.S. Department of Energy (DOE or the Department) developed the preliminary range of ***alternative segments***. Section C.2 describes the public scoping process and the comments DOE received and used as input to development of the sets of alternative segments and ***common segments*** analyzed in detail in the Rail Alignment EIS. Section C.3 describes the alignment identification and analysis process. Section C.4 describes alternative segments eliminated from detailed analysis. Section C.5 describes the process DOE used to refine the alternative segments.

C.1 Development of the Range of Alternative Segments

Alternative segments are portions of the rail alignments for which DOE is considering two or more routes for the rail line.

Common segments are portions of the rail alignments for which DOE has identified a single route for the rail line.

To develop the range of alternative segments for evaluation in the Rail Alignment EIS, DOE evaluated a suite of potential alternative segments for the Caliente Implementing Alternative and the Mina Implementing Alternative to determine whether they would be practical or feasible from a technical, environmental, and economic standpoint. To develop the range of alternative segments, DOE:

- Identified public comments related to alternative segments; considered comments that suggested specific alternative segments, and comments that could be construed as criteria to modify the preliminary alternative segments and common segments described in the Notices of Intent (69 *FR* 18565, April 18, 2004; and *FR* 60484, October 13, 2006, or as criteria to identify new alternative segments.
- Identified engineering factors relevant to the design and construction of a rail line; considered factors consistent with those of railroad-industry standards and practices.
- Identified environmental features to determine whether they would be directly affected by potential alternative segments and common segments; considered features such as springs, wetlands, and Wilderness Study Areas.
- Identified potential conflicts with land uses, including American Indian lands, private lands, and mineral resources.
- Evaluated then-currently available information, such as U.S. Geological Survey topographic maps and associated databases.

- Evaluated the suite of potential alternative segments to determine whether they could be constructed to satisfy the engineering factors and avoid environmental features.
- Estimated costs to construct each potential alternative segment.

The process involved a number of steps for each rail corridor, as depicted on Figure C-1. Sections C.2.1 through C.5 describe the evaluative process and results in more detail.

C.1.1 DEVELOPMENT OF THE RANGE OF ALTERNATIVE SEGMENTS WITHIN THE CALIENTE RAIL CORRIDOR

In the *Notice of Intent to Prepare an EIS for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (69 *Federal Register* [*FR*] 18565, April 8, 2004) (Notice of Intent), DOE identified preliminary alternative segments and common segments to be evaluated in the Rail Alignment EIS (Figure C-2).

The Department estimated that about 55 percent of the length of the Caliente rail corridor would not have alternative segments and these areas would be referred to as common segments. In the Notice of Intent, DOE indicated it would consider potential alternative segments outside the 0.4-kilometer (0.25-mile)-wide Caliente rail corridor that might minimize, avoid, or otherwise mitigate adverse environmental ***impacts***. More specifically, DOE invited comment on the following:

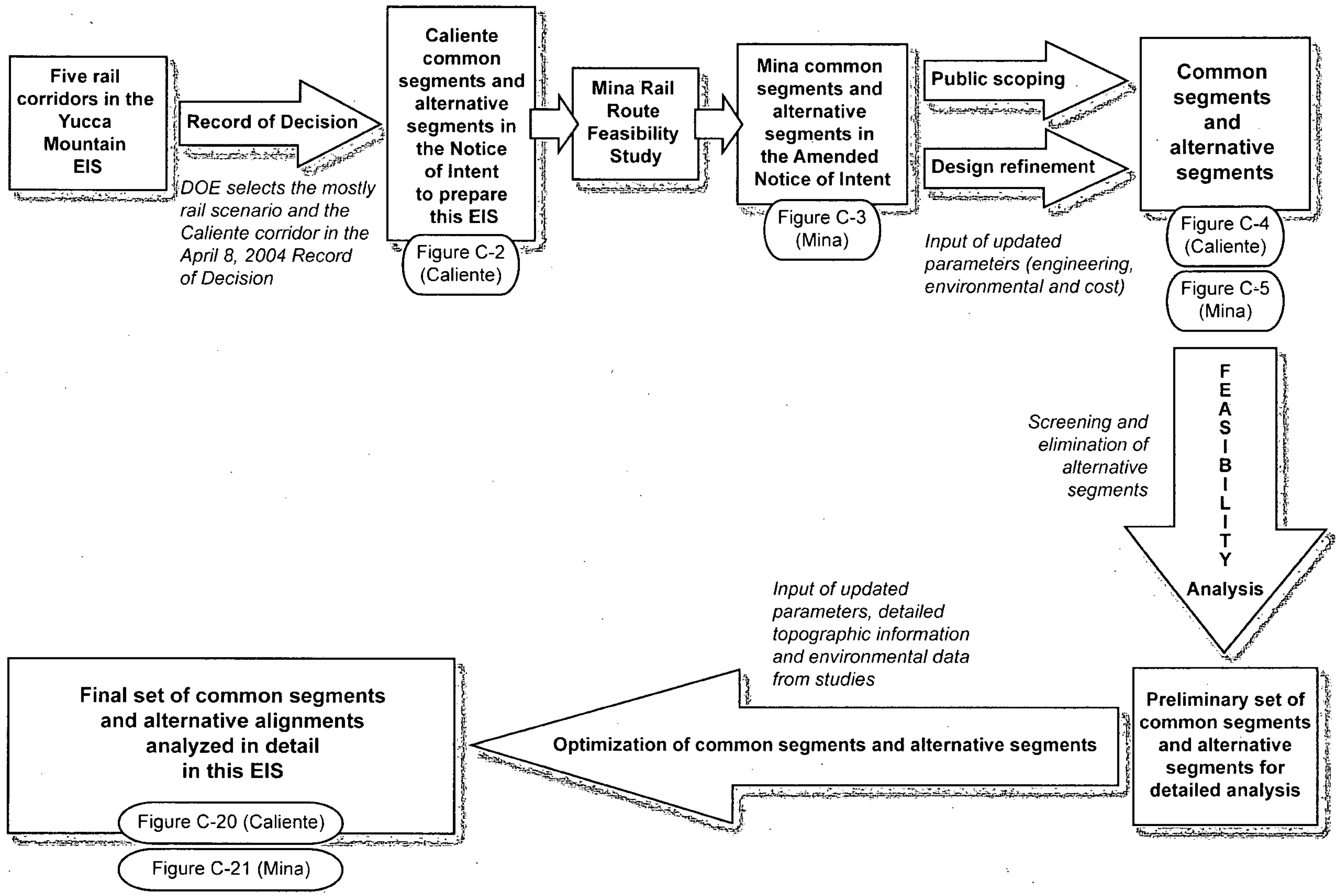
- Should additional alternative segments be considered that might minimize, avoid, or mitigate adverse environmental impacts, such as avoiding Wilderness Study Areas, American Indian Trust Lands, or encroachment on the Nevada Test and Training Range?
- Should any of the preliminary alternative segments be eliminated from detailed study?

C.1.2 DEVELOPMENT OF THE RANGE OF ALTERNATIVE SEGMENTS WITHIN THE MINA RAIL CORRIDOR

In the *Amended Notice of Intent to Expand the Scope of the Environmental Impact Statement for the Alignment, Construction, and Operation of a Rail Line to a Geologic Repository at Yucca Mountain, Nye County, NV* (71 *FR* 60484, October 13, 2006) (Notice of Intent), DOE announced that it had identified preliminary alternative segments and common segments for the Mina rail corridor to be evaluated in the Rail Alignment EIS (Figure C-3). In response to communications with the Walker River Paiute Tribe, DOE initiated a study to determine the feasibility of a rail line in the Mina rail corridor and to identify preliminary alternative segments (DIRS 180222-BSC 2006, all).

Based on this preliminary feasibility study, and the resultant alternative segments and common segments, DOE determined that the Mina rail corridor did warrant further detailed study.

The resulting alternative segments and common segments were presented in the Amended Notice of Intent. Through the Notice, DOE solicited input from the public regarding either the elimination of alternative segments, or identification and evaluation of any additional alternative segments within the Caliente rail corridor or Mina rail corridor that would reduce or avoid potential adverse environmental impacts.



Note: Although the same process and series of steps applies to both the Mina and Caliente rail corridors, these processes and steps occurred during different time periods.

Figure C-1. Process used to evaluate the Caliente and Mina rail corridors.

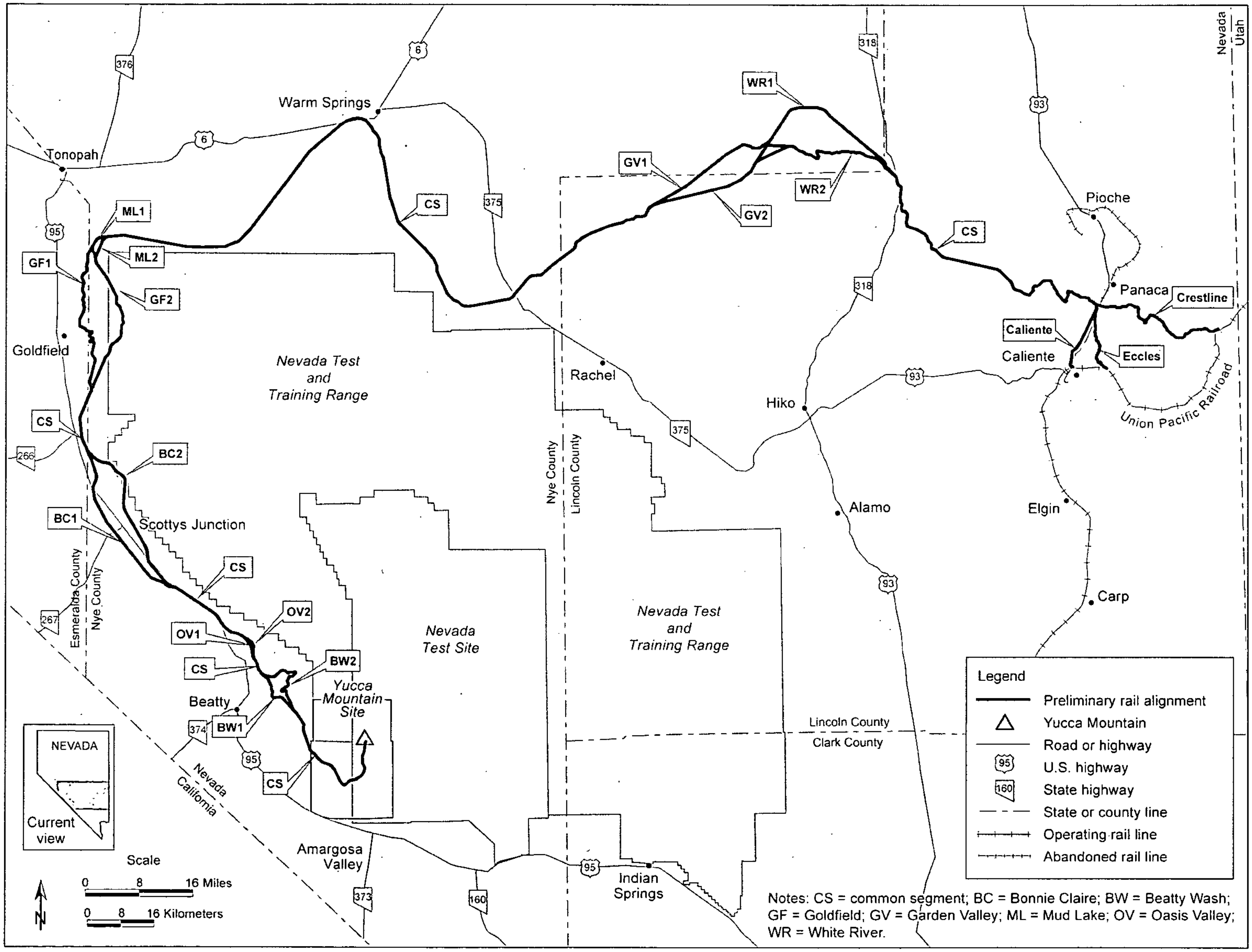


Figure C-2. Caliente rail corridor preliminary alternative segments and common segments as identified in the Notice of Intent.

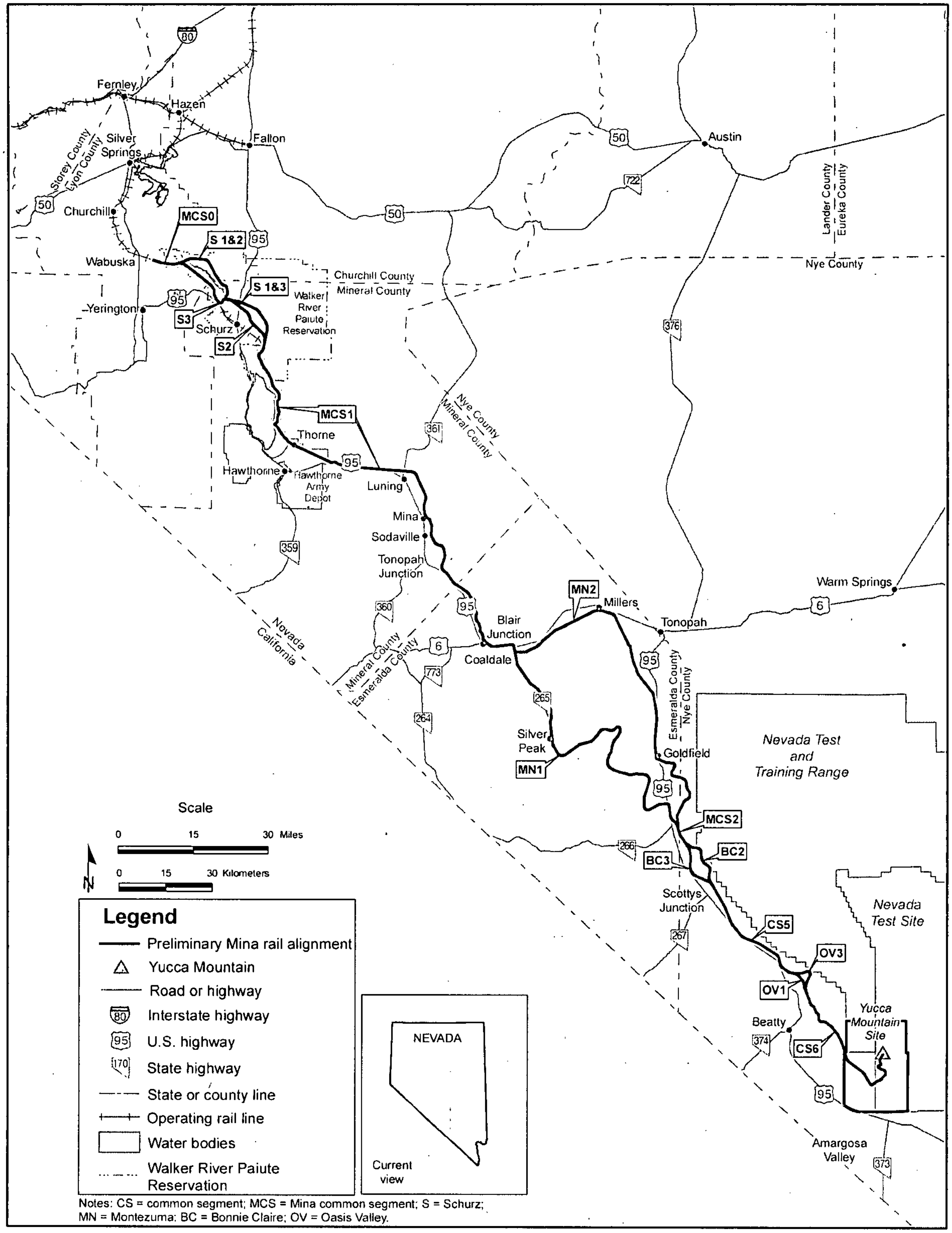


Figure C-3. Mina rail corridor preliminary alternative segments and common segments as identified in the Amended Notice of Intent.

C.2 Public Scoping

C.2.1 CALIENTE RAIL ALIGNMENT PUBLIC SCOPING

The Notice of Intent identified preliminary alternative segments to be evaluated in the Rail Alignment EIS. DOE evaluated all public comments received as a result of the public scoping process.

The Department considered comments the Bureau of Land Management (BLM) received during its public meetings on the DOE proposed land ***withdrawal*** from surface and mining entry for the Caliente rail corridor (see Chapter 1 of the Rail Alignment EIS) and information from interviews conducted by Lincoln and Nye Counties.

From these sources, DOE identified and evaluated all comments that could affect the preliminary alternative segments identified in the Notice of Intent and common segments. Some commenters offered specific recommendations or alternative segments, such as:

- Establish the interface with the Union Pacific Railroad near Elgin, Nevada.
- Start in Caliente, Nevada, and follow U.S. Highway 93 and State Route 375 to avoid Garden Valley.
- Cross south of the Weepah Springs Wilderness and pass through Seaman Narrows to Murphy Gap and then north to avoid Garden Valley.
- Bypass Goldfield to the west to avoid the town and its historic mining district.

Commenters also suggested that DOE use various criteria to modify the preliminary alternative segments and to identify new alternative segments. For example, commenters suggested that DOE avoid conflicts with, or impacts to, sensitive biological and cultural resources, mineral resources, mining operations, American Indian Trust Lands, the Nevada Test and Training Range, ranching and grazing land uses, and private lands.

C.2.2 MINA RAIL ALIGNMENT PUBLIC SCOPING

In the Amended Notice of Intent, DOE invited public comments concerning the evaluation of the Mina rail alignment in the Rail Alignment EIS. DOE developed a range of alternative segments for the Mina rail corridor to be evaluated in the EIS. The initial alternative segments and common segments were documented in the *Mina Rail Route Feasibility Study* (DIRS 180222-BSC 2006, all). DOE presented the preliminary alternative segments at public scoping meetings and through information provided at reading rooms in various towns in the general vicinity of the Mina rail corridor (see Chapter 1 of the Rail Alignment EIS).

DOE considered comments that suggested specific alternative segments and comments that could be construed as criteria to modify the preliminary alternative segments and common segments described in the Amended Notice of Intent, or as criteria to identify new alternative segments. Some commenters offered specific recommendations or alternative segments, for example:

- Follow the existing (unused) rail roadbed through Tonopah to minimize impacts.
- Follow the existing rail roadbed where feasible.
- Move Mina rail alignment Montezuma alternative segment 2/Caliente rail alignment Goldfield alternative segment 4 as far west as possible to avoid mining claims in the area.
- Avoid all communities.

DOE considered all comments and in some cases identified alternative segments that warranted further investigation. Commenters also suggested that DOE use various criteria to modify the preliminary alternative segments and to identify new alternative segments.

C.3 Alignment Identification and Analysis

C.3.1 CALIENTE RAIL CORRIDOR ALIGNMENT IDENTIFICATION AND ANALYSIS

Following the public scoping process, DOE identified additional alternative segments for the Caliente rail alignment, and modified the preliminary alternative segments and common segments identified in the Notice of Intent. To do so, DOE used a computer-based modeling system that allowed the Department to consider multiple alternative segments within the geographic area of the Caliente rail corridor.

First, DOE used the computer modeling system to evaluate topographic data to determine whether common segments and alternative segments would be relatively linear, or whether they would need to curve to avoid or reduce conflicts with areas having greater topographic relief, such as mountain ranges or associated foothills. Topographic data were based on U.S. Geological Survey maps compiled from two sets of information: (1) year 2003 roads, streams, and other landmarks and (2) year 2000 (or more recent) contour data. The system integrated topographic data with engineering factors, specifically the project-specific design elements and the associated standard. Table C-1 lists the primary engineering factors and standards DOE considered.

Table C-1. Primary engineering factors considered in the identification and analysis of Caliente and Mina alternative segments and common segments[a] (page 1 of 2).

Design element	Standard	Refinement software input
Civil works design speed	60 miles per hour[b]	Included in curvature and grade specifications
Operating train speed	Maximum 50 miles per hour	Included in curvature and grade specifications
Construction right-of-way width	1,000 feet[c] (nominal)	Defined 1,000-foot-wide right-of-way
Operations right-of-way width (minimum)	200 feet (nominal); expected to be narrower than the construction right-of-way in most cases. In some areas it could be the same width as the construction right-of-way. Actual operations right-of-way would be defined during final design.	Addressed by setting cut bench width
Vertical curves: rate of change between track gradients	Comply with American Railway Engineering and Maintenance-of-Way Association speed-based criteria	Defined in network data settings
Rail roadbed section		
Roadbed width (fill)	15 feet 6 inches[d] from centerline, 31 feet total	Generalized cross sections addressed through settings of cut bench width and geotypes
Roadbed width (cut)	62 feet total	
Subballast depth	Minimum 6 inches	

Table C-1. Primary engineering factors considered in the identification and analysis of Caliente and Mina alternative segments and common segments[a] (page 2 of 2).

Design element	Standard	Refinement software input
Vertical grades		
Maximum (allowable)	2 percent (curve-compensated)	Network data set so that grades on curves had to be compensated at 0.04 percent per degree of curve
Horizontal curve	6°–00" (mainline); radius = 955 feet	Defined in network data settings
Maximum degree of curve for yards and sidings	10°–00"; radius = 574 feet	
Minimum length of spiral per 0.5 inch of superelevation	30 feet	
Tangent lengths (between horizontal reverse curves)	300 feet 150 feet (yards, sidings, and back tracks)	Approximated with stiffness parameter in network data settings
Clearances for highway overpass		
Vertical	24 feet minimum	Vertical clearances requirements set as linear feature crossing rule

a. Source: DIRS 176584-Nevada Rail Partners 2006, all.
b. To convert miles per hour to kilometers per hour, multiply by 1.6093.
c. To convert feet to meters, multiply by 0.3048.
d. To convert inches to centimeters, multiply by 2.54.

DOE considered the following environmental and land-use features:

- Springs
- Wilderness Areas, Wilderness Study Areas, and wildlife preserves
- Locations of sensitive biological species
- Cultural resources
- Private lands, including patented mining claims
- Native American Trust Lands
- Federally managed lands, including the Nevada Test and Training Range, U.S. Forest Service lands, and National Parks

With this integrated information, the computer modeling system identified and evaluated several million routes within the geographic limits defined by the input of start and stop points. The system, however, identified the 20 to 50 potential routes (for each start/stop point set) that came closest to, or most satisfied, engineering factors, and minimized or avoided conflicts with environmental and land-use features at the lowest cost to construct. Based on this information, DOE selected one route, known as the Caliente rail alignment, for further evaluation (DIRS 176584-Nevada Rail Partners 2006, all). This rail alignment consists of alternative segments and common segments.

For each alternative segment and common segment, the computer modeling system provided information and data in a number of ways, including plan and profile, horizontal and vertical curvatures, and grade profiles. DOE used this information and data to estimate construction-related items such as earthworks (***cuts***, ***fills***, and haulage) and rail roadbeds (***subballast***, ***ballast***, track, and ties), and to identify design features such as bridges, overpasses, and underpasses. DOE also used the computer modeling system to develop preliminary construction-cost estimates by considering cost factors for construction-related items and design features. In general, the avoidance of environmental and land-use features typically resulted in alternative segments and common that were longer, which tended to increase earthworks, length of rail roadbeds, the number of structures, and, thus, construction costs (DIRS 176584-Nevada Rail Partners 2006, all).

Figure C-4 shows the full suite of common segments and potential alternative segments DOE produced for the Caliente rail corridor as a result of its analyses and public scoping comments.

C.3.2 MINA RAIL CORRIDOR ALIGNMENT IDENTIFICATION AND ANALYSIS

DOE developed the *Mina Rail Route Feasibility Study* (DIRS 180222-BSC 2006, all) to determine the feasibility of identifying a 0.4-kilometer (0.25-mile)-wide corridor in which to engineer a rail alignment that meets specific engineering criteria. As with the Caliente rail alignment, DOE employed software (using data from the feasibility study) to determine the feasibility of new alternative segments and common segments and realign existing alternative segments and common segments based on comments received during the scoping period. The software computes each segment's horizontal and vertical geometry and the cut and fill (earthwork) needed to construct each. The software then computes the segment geometries, incorporating topographic information, location-specific information, cross-section templates, and engineering criteria (as listed in Table C-1). Also addressed within the system were environmental and land-use features to be considered including:

- Springs
- Wilderness Areas, Wilderness Study Areas and wildlife preserves
- Locations of sensitive biological species
- Cultural resources
- Private lands, including patented mining claims
- American Indian Trust Lands
- Federally managed lands, including the Hawthorne Army Depot, U.S. Forest Service Lands, and national parks

The modeling software derived alternative segments and common segments that met the applicable design criteria while addressing the need to minimize or avoid potentially adverse environmental impacts.

For each alternative segment and common segment, the software provided information and data in a number of ways, including plan and profile, horizontal and vertical curvatures, and grade profiles. DOE used this information and data for each alternative segment and common segment to estimate construction-related items such as earthworks (cuts, fills, and haulage) and rail roadbeds (subballast, ballast, track, and ties), and to identify design features such as bridges, overpasses, and underpasses.

DOE also used the software to develop preliminary construction cost estimates by considering cost factors for construction-related items and design features. In general, the avoidance of environmental features typically resulted in longer common segments and alternative segments, which tended to increase earthworks, length of rail roadbeds, and the number of structures, and thus construction costs (DIRS 176584-Nevada Rail Partners 2006, all).

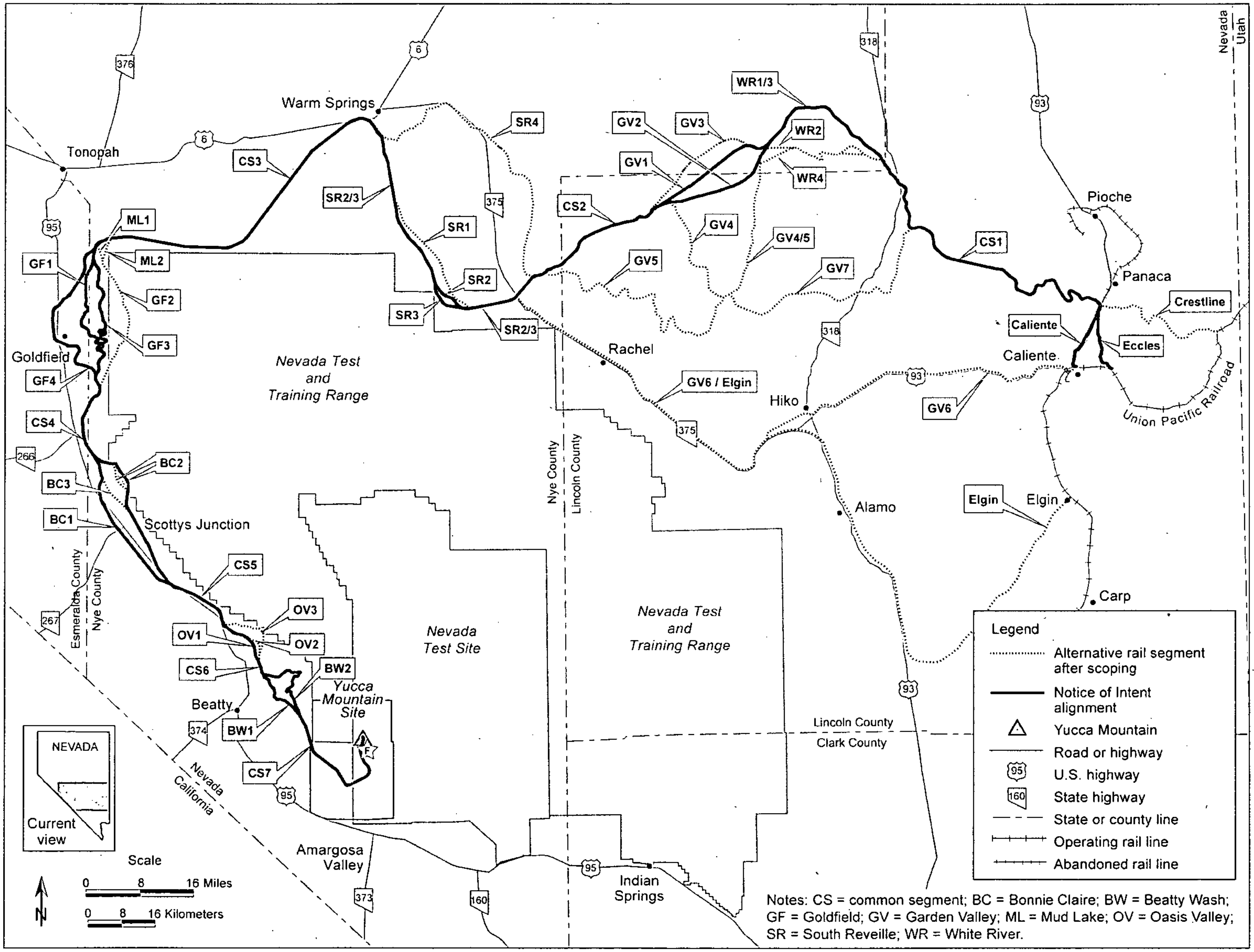


Figure C-4. Suite of potential alternative segments for the Caliente rail corridor.

As a result of the scoping process and subsequent analyses, DOE made several changes to the Mina rail alignment, as follows:

- At the request of the Walker River Paiute Tribe, eliminated two of the initial Schurz alternative segments and added three others.
- Made a slight modification to Mina common segment 1 in the Redlich area.
- Added a new alternative segment called Montezuma 3, which combined the northern section of Montezuma 2 and the southern section of Montezuma 1 with a crossover along the alluvial fans north of the Montezuma Range. The result was a new alignment that would avoid the communities of Goldfield and Silver Peak.

Figure C-5 shows the full suite of alternative segments and common segments DOE produced for the Mina rail corridor as a result of its analyses and public scoping comments.

C.4 Alternative Segments Eliminated from Detailed Analysis

Council on Environmental Quality regulations that implement the procedural requirements of NEPA (40 CFR 1502.14) and DOE regulations (10 CFR Part 1021) require the identification and evaluation of a range of alternatives that might accomplish the objectives of the Proposed Action. In accordance with these regulations, this section briefly describes the alternative segments DOE eliminated from detailed study and the reasons for their elimination. Alternative segments and common segments DOE did not eliminate are those that are practical or feasible from a technical, environmental, and economic standpoint.

DOE adjusted alternative segments and common segments described in Section 2.2 of the Rail Alignment EIS from those identified in the Notice of Intent and the Amended Notice of Intent. In some cases, the lengths of the common segments have changed as alternative segments have been eliminated. The primary reasons for eliminating or adjusting an alternative segment include:

- Environmental constraints, such as impacts to Wilderness Areas or wildlife preserves
- Avoidance of private lands, mineral resources, or oil resources
- Engineering considerations, such as steep, heavy grades; tight curvature; tunneling; or excessive excavation or placement of fill materials
- Public safety and national security issues associated with the Nevada Test and Training Range

C.4.1 CALIENTE RAIL ALIGNMENT ALTERNATIVE SEGMENTS ELIMINATED FROM DETAILED ANALYSIS

Figure C-6 shows the Caliente rail alignment alternative segments DOE eliminated from detailed analysis. Table C-2 lists the alternative segments DOE identified in its Notice of Intent (69 *FR* 18565, April 8, 2004) and added for consideration based on public comments received during the EIS scoping process. The table also summarizes the reasons DOE eliminated certain of these alternative segments from detailed analysis in the Rail Alignment EIS.

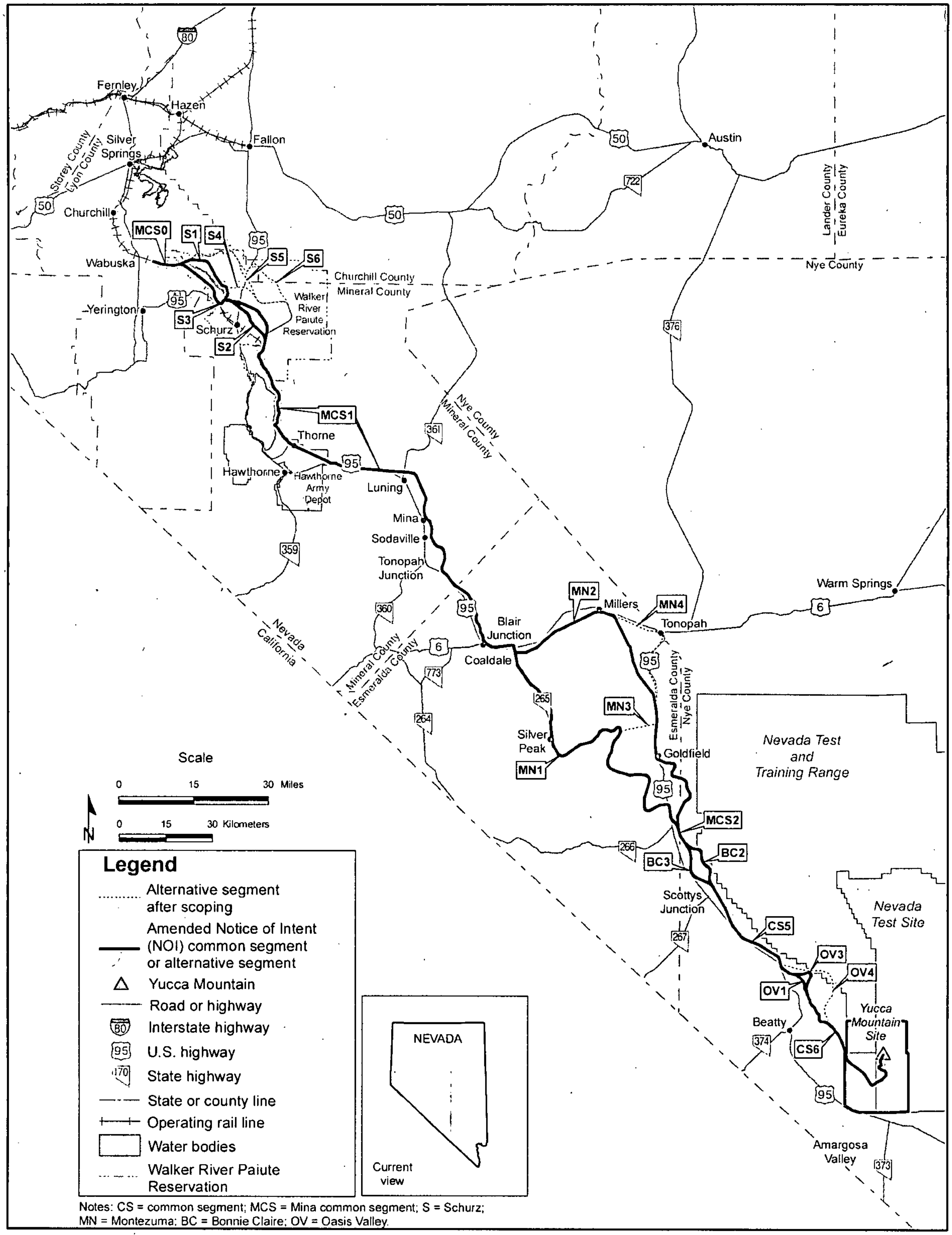


Figure C-5. Suite of potential alternative segments for the Mina rail corridor.

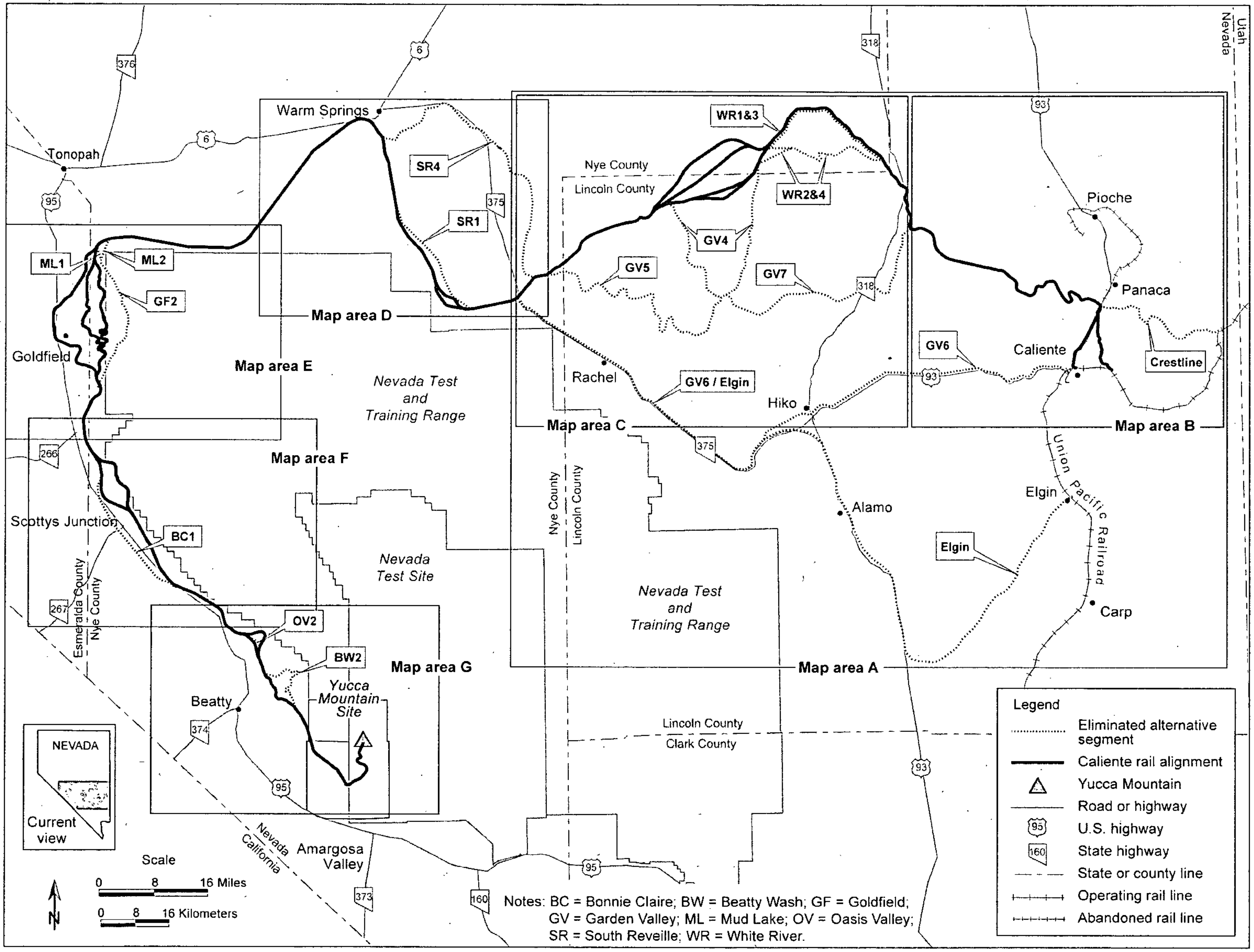


Figure C-6. Caliente rail alignment alternative segments DOE eliminated from detailed analysis.

Table C-2. Caliente rail alignment alternative segments identified and analyzed or eliminated from detailed analysis (page 1 of 3).

Map area	Alternative segment	Notice of Intent	Scoping	Analyzed in detail or eliminated
Interface with the Union Pacific Railroad Mainline	Caliente	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Eccles	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Crestline	Alternative segment identified		Eliminated because engineering criteria not met.
	Elgin		Alternative segment identified	Eliminated because it would exceed maximum allowable grade.
White River Valley Area	White River 1	Alternative segment identified		With the elimination of White River 2 and 3, White River 1 became part of common segment 1.
	White River 2	Alternative segment identified		Eliminated because engineering criteria not met and possible requirement for tunnel through Timber Mountains.
	White River 3		Alternative segment identified	When White River 2 and 3 were eliminated, White River 3 became part of common segment 1.
	White River 4		Alternative segment identified	Eliminated because engineering criteria not met and possible requirement for tunnel through Timber Mountains.
Garden Valley Area	Garden Valley 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Garden Valley 2	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Garden Valley 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	Garden Valley 4		Alternative segment identified	Eliminated because of operational issues.
	Garden Valley 5		Alternative segment identified	Eliminated because engineering criteria not met.
	Garden Valley 6		Alternative segment identified	Eliminated because engineering criteria not met.
	Garden Valley 7		Alternative segment identified	Eliminated because engineering criteria not met.
	Garden Valley 8		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.

Table C-2. Caliente rail alignment alternative segments identified and analyzed or eliminated from detailed analysis (page 2 of 3).

Map area	Alternative segment	Notice of Intent	Scoping	Analyzed in detail or eliminated
South Reveille Area	South Reveille 1	Alternative segment identified		Eliminated because it would cross into the South Reveille Wilderness Study Area.
	South Reveille 2		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	South Reveille 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	South Reveille 4		Alternative segment identified	Eliminated because engineering criteria not met.
Mud Lake Area	Mud Lake 1	Alternative segment identified		Eliminated because it links to Goldfield 2, which was also eliminated.
	Mud Lake 2	Alternative segment identified		Eliminated because it links to Goldfield 2, which was also eliminated.
Goldfield Area	Goldfield 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Goldfield 2	Alternative segment identified		Eliminated because it would enter the Nevada Test and Training Range.
	Goldfield 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	Goldfield 4		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
Bonnie Claire Area	Bonnie Claire 1	Alternative segment identified		Eliminated because it would enter Timbisha Shoshone Trust Lands.
	Bonnie Claire 2	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Bonnie Claire 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
Oasis Valley Area	Oasis Valley 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Oasis Valley 2	Alternative segment identified		Eliminated during the public scoping process because engineering factors and land use features are similar to Oasis Valley 1.
	Oasis Valley 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.

Table C-2. Caliente rail alignment alternative segments identified and analyzed or eliminated from detailed analysis (page 3 of 3).

Map area	Alternative segment	Notice of Intent	Scoping	Analyzed in detail or eliminated
Beatty Wash Area	Beatty Wash 1	Alternative segment identified		When Beatty Wash 2 was eliminated, Beatty Wash 1 became part of common segment 6.
	Beatty Wash 2	Alternative segment identified		Eliminated because engineering criteria not met.

C.4.1.1 Alternative Segments at the Interface with the Union Pacific Railroad Mainline

DOE identified four alternative segments to connect the rail line to the existing mainline railroad in eastern Nevada (Figures C-7 and C-8). The Notice of Intent identified Caliente, Eccles, and Crestline as possible interface locations near Caliente, Nevada. In response to public scoping comments suggesting an interface location near the town of Elgin, Nevada, DOE identified Elgin as a fourth alternative segment. The Department then evaluated whether these four alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. The terrain around Crestline rendered it technically infeasible and Elgin would exceed the maximum allowable grade. Based on this analysis, DOE eliminated Crestline and Elgin from detailed analysis in the Rail Alignment EIS. The Department found the Caliente and Eccles alternative segments to be feasible from a technical and economic standpoint. Table C-3 provides a comparison of the key factors the Department used in this determination.

Table C-3. Comparison of possible alternative segments for the Interface with the Union Pacific Railroad Mainline.[a]

Attribute	**Crestline**	Eccles	Caliente	**Elgin**
Length (kilometers)[b]	39	18	18	225[c]
Construction cost ($ millions)	140	148	71.6	1,500[c]
Engineering factors	Rugged terrain and insufficient flat land to accommodate rail yard and associated facilities at the interchange with the Union Pacific Railroad mainline	Meets engineering design criteria	Meets engineering design criteria	Would exceed maximum allowable grade
Key environmental and land-use features	No notable environmental or land-use constraints	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	No notable environmental or land-use constraints

a. Eliminated alternative segments are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.
c. Elgin interface does not share a common end point with the other interface alternative segments.

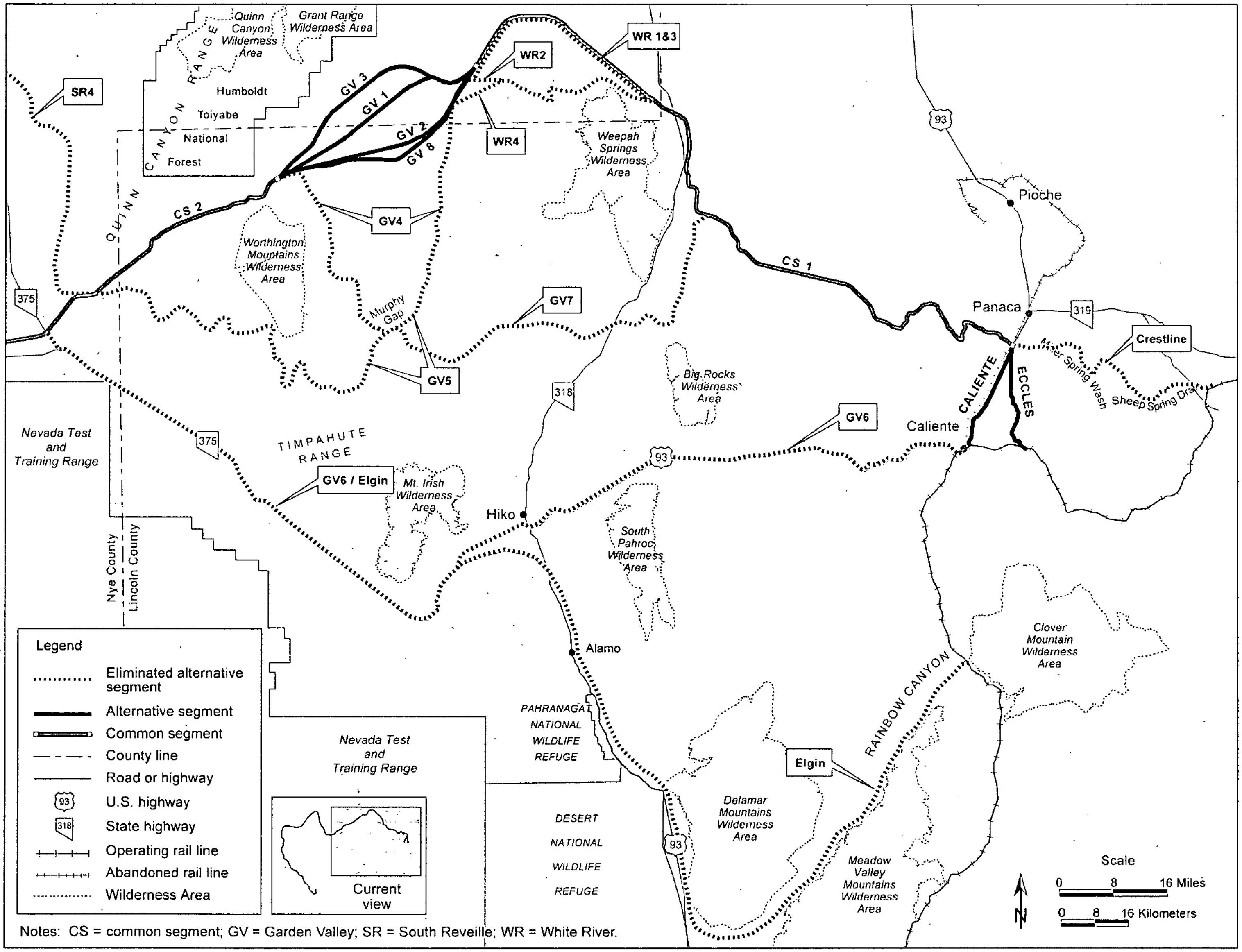


Figure C-7. Eliminated segments within Caliente map area A.

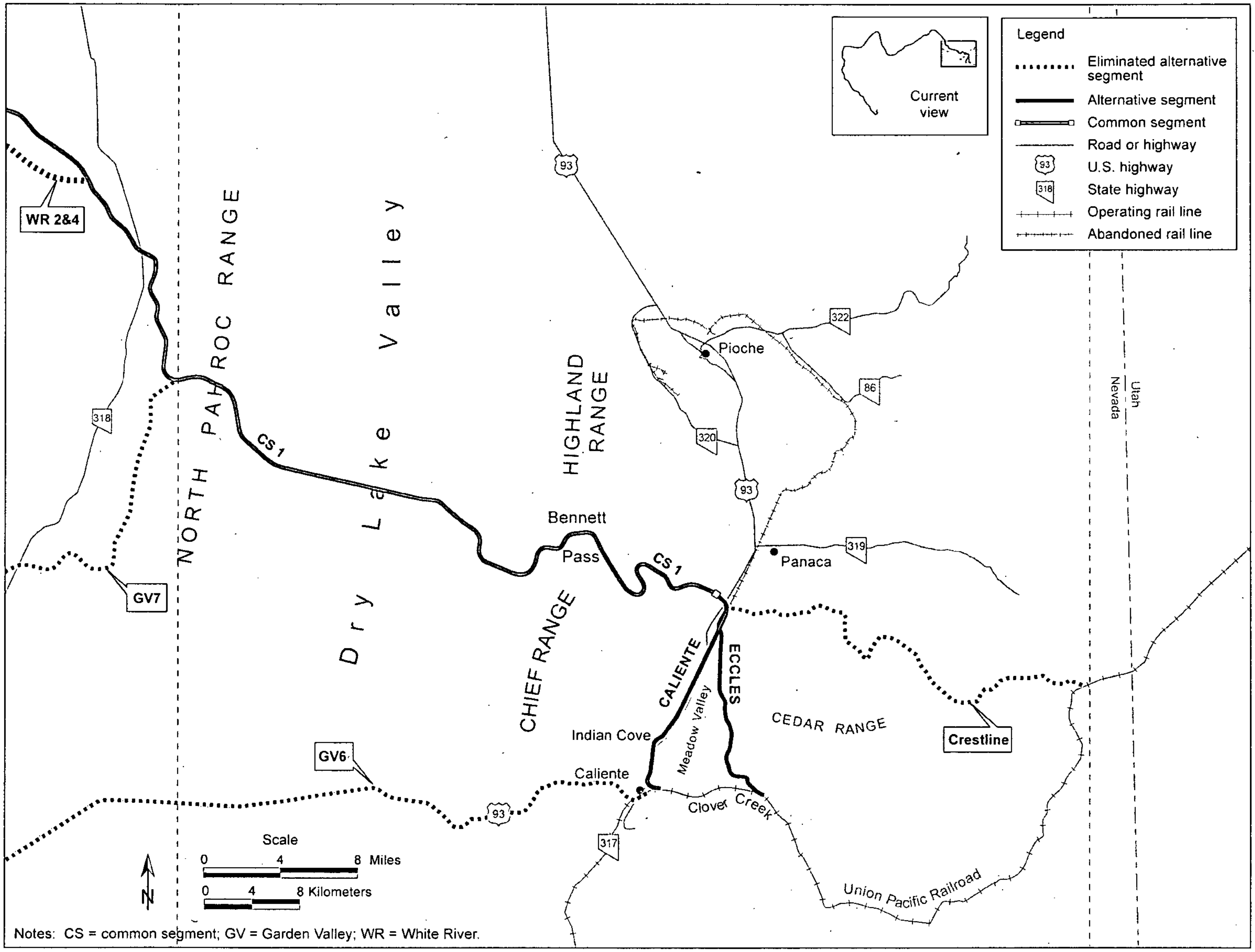


Figure C-8. Eliminated segments within Caliente map area B.

C.4.1.2 White River Valley Alternative Segments

DOE identified four possible alternative segments in the White River Valley area (Figures C-7 and C-9). The Notice of Intent identified White River 1 and White River 2. Later, DOE identified alternative segments White River 3 and White River 4 to avoid the Weepah Springs Wilderness. The Department then evaluated whether these four alternative segments would be technically feasible according to the engineering design criteria, estimated the cost to construct each alternative segment, and considered the environmental and land-use features associated with each. White River 2 and White River 4 would have required long stretches at the maximum allowable grade, might have required a tunnel through the Timber Mountains, and would be three times as costly as White River 1 and White River 3. Based on this analysis, DOE eliminated White River 2 and White River 4 from detailed analysis in the Rail Alignment EIS. DOE found White River 1 and 3 to be feasible from a technical and economic standpoint. Table C-4 provides a comparison of the key factors used in this determination.

Because DOE eliminated White River 2 and White River 4 from consideration, it was no longer necessary to maintain a distinction between White River 1 and White River 3. Although White River 3 was slightly longer than White River 1, elimination of White River 2 and White River 4 allowed DOE to establish a common end for White River 1 and White River 3, and then made the two alternative segments part of Caliente common segment 1.

Table C-4. Comparison of possible alternative segments in the White River Valley area.[a]

Attribute	White River 1	**White River 2**	White River 3	**White River 4**
Length (kilometers)[b]	47	42	48	42
Construction cost ($ millions)	46	160	46	140
Engineering factors	Would include a short stretch at maximum allowable grade	Would require long stretches at maximum allowable grade and/or a potential tunnel through the Timber Mountains	Would include a short stretch at maximum allowable grade	Would require long stretches at maximum allowable grade and/or a potential tunnel through the Timber Mountains
Key environmental and land-use features	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints

a. Eliminated alternative segments are shown in bold.
b. To convert kilometers to miles, multiply by 0.62137.

C.4.1.3 Garden Valley Alternative Segments

DOE identified eight alternative segments in the Garden Valley area (Figures C-7 and C-9). The Notice of Intent identified Garden Valley 1 and Garden Valley 2. In response to public scoping comments regarding Garden Valley and perceived noise and visual impacts to an earthworks sculpture, *City*, DOE identified six additional alternative segments in the area (Garden Valley 3 through Garden Valley 8). The Department then evaluated whether the eight alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. Garden Valley 4, 5, 6, and 7 would either exceed maximum allowable grade or require significant earthwork or construction of tunnels. Also, these alternative segments would have been longer than other available alternative segments in Garden Valley. For these reasons, construction costs for Garden Valley 4, 5, 6, and 7 would have been significantly greater than for any of the other Garden Valley alternative segments. Therefore, DOE eliminated Garden Valley 4, 5, 6, and 7 from detailed analysis in the Rail Alignment EIS. Garden Valley 1, 2, 3, and 8 would be feasible from a technical, environmental, land-use, and economic standpoint. Table C-5 provides a comparison of the key factors DOE used in this determination.

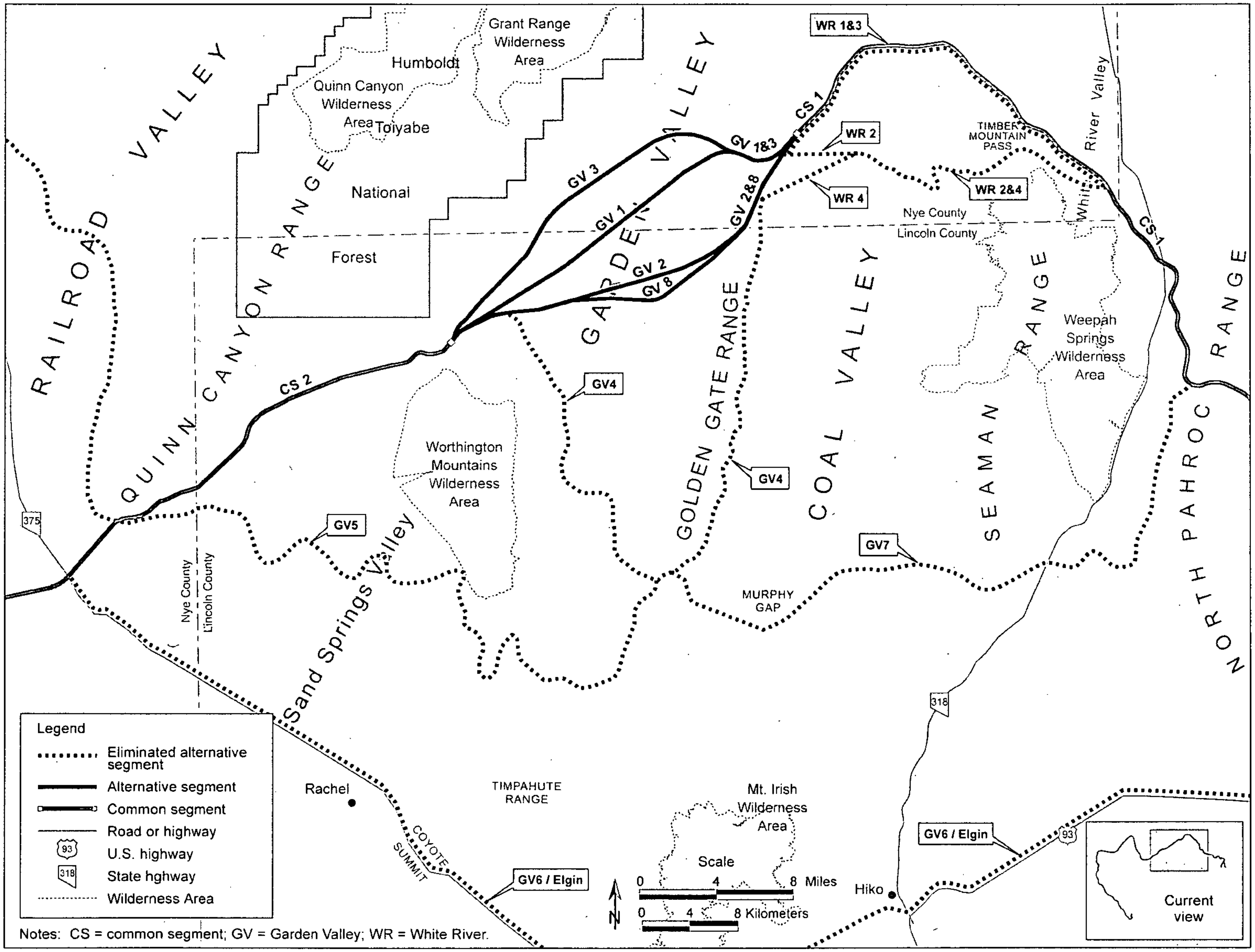


Figure C-9. Eliminated segments within Caliente map area C.

Table C-5. Comparison of possible alternative segments in Garden Valley.[a]

Attribute	Garden Valley 1	Garden Valley 2	Garden Valley 3	**Garden Valley 4**	**Garden Valley 5**	**Garden Valley 6**	**Garden Valley 7**	Garden Valley 8
Length (kilometers)[b]	35	36	38	68[c]	100[c]	160[c]	100[c]	37
Construction cost ($ millions)	126	120	109	170	160[d]	1,600[d]	380[d]	154
Engineering factors	Meets engineering design criteria	Meets engineering design criteria	Meets engineering design criteria	Would require more than 10 miles of continuous maximum allowable grade through Murphy Gap	Would exceed maximum allowable grade and there would be more than 10 miles of continuous maximum grade	Would require extensive tunneling to exit Caliente and then through each of the three passes to the west	Would require more than 10 miles of continuous maximum allowable grade through Murphy Gap	Meets engineering design criteria
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints	No notable environmental or land-use constraints

a. Eliminated alternative segments are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.
c. Garden Valley 4, 5, 6, and 7 do not share common starting and ending points with the other Garden Valley alternative segments.
d. Cost is approximate because the computer-based modeling system could not identify a feasible alignment for which construction costs could be estimated.

C.4.1.4 South Reveille Alternative Segments

DOE identified four alternative segments in the South Reveille area, South Reveille 1 through South Reveille 4 (Figure C-10). South Reveille 1 was originally considered a common segment in the Notice of Intent, but became an alternative segment with the addition of South Reveille 2, South Reveille 3, and South Reveille 4. DOE developed these alternative segments in response to public scoping comments to avoid the South Reveille Wilderness Study Area, which the original common segment (South Reveille 1) would intersect. The Department then evaluated whether these four alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the potential environmental and land-use features associated with each. DOE concluded that South Reveille 1 would be incompatible with the current uses of the South Reveille Wilderness Study Area, and that South Reveille 4 would exceed the maximum allowable grade. Based on this analysis, the Department eliminated South Reveille 1 and South Reveille 4 from detailed analysis in the Rail Alignment EIS. Though there could be impacts to cultural resources along South Reveille 2 and land-uses along South Reveille 2 and 3 might be affected in the absence of mitigation, these constraints did not warrant elimination of South Reveille 2 and South Reveille 3. The DOE analysis found that South Reveille alternative segments 1 and 3 appear to be feasible from a technical and economic standpoint. Table C-6 provides a comparison of the key factors DOE used in this determination.

Table C-6. Comparison of possible alternative segments in Reveille Valley.[a]

Attribute	**South Reveille 1**	South Reveille 2	South Reveille 3	**South Reveille 4**
Length (kilometers)[b]	Alternative segment not evaluated because it would cross into the South Reveille Wilderness Study Area	19	20	84
Construction cost ($ millions)		82.6	80.3	126
Engineering factors		Meets engineering design criteria	Meets engineering design criteria	Would exceed maximum allowable grade
Key environmental and land-use features		Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segments are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

C.4.1.5 Mud Lake Alternative Segments

The Notice of Intent identified two alternative segments in the Mud Lake area, Mud Lake 1 and Mud Lake 2 (Figure C-11). Mud Lake alternative segments 1 and 2 would begin near the northwest corner of the Nevada Test and Training Range. Mud Lake 1 would pass about 2 kilometers (1 mile) northwest of Mud Lake, avoiding its western shore, and would extend south to connect with Goldfield alternative segment 2. Mud Lake 2 would depart Caliente common segment 3 and run farther to the east before connecting with Goldfield alternative segment 2. Due to this arrangement, both Mud Lake alternative segments were dependent on Goldfield 2 as a viable alternative segment. Therefore, when DOE eliminated Goldfield 2 from further analysis, as described below, both Mud Lake 1 and Mud Lake 2 were also eliminated.

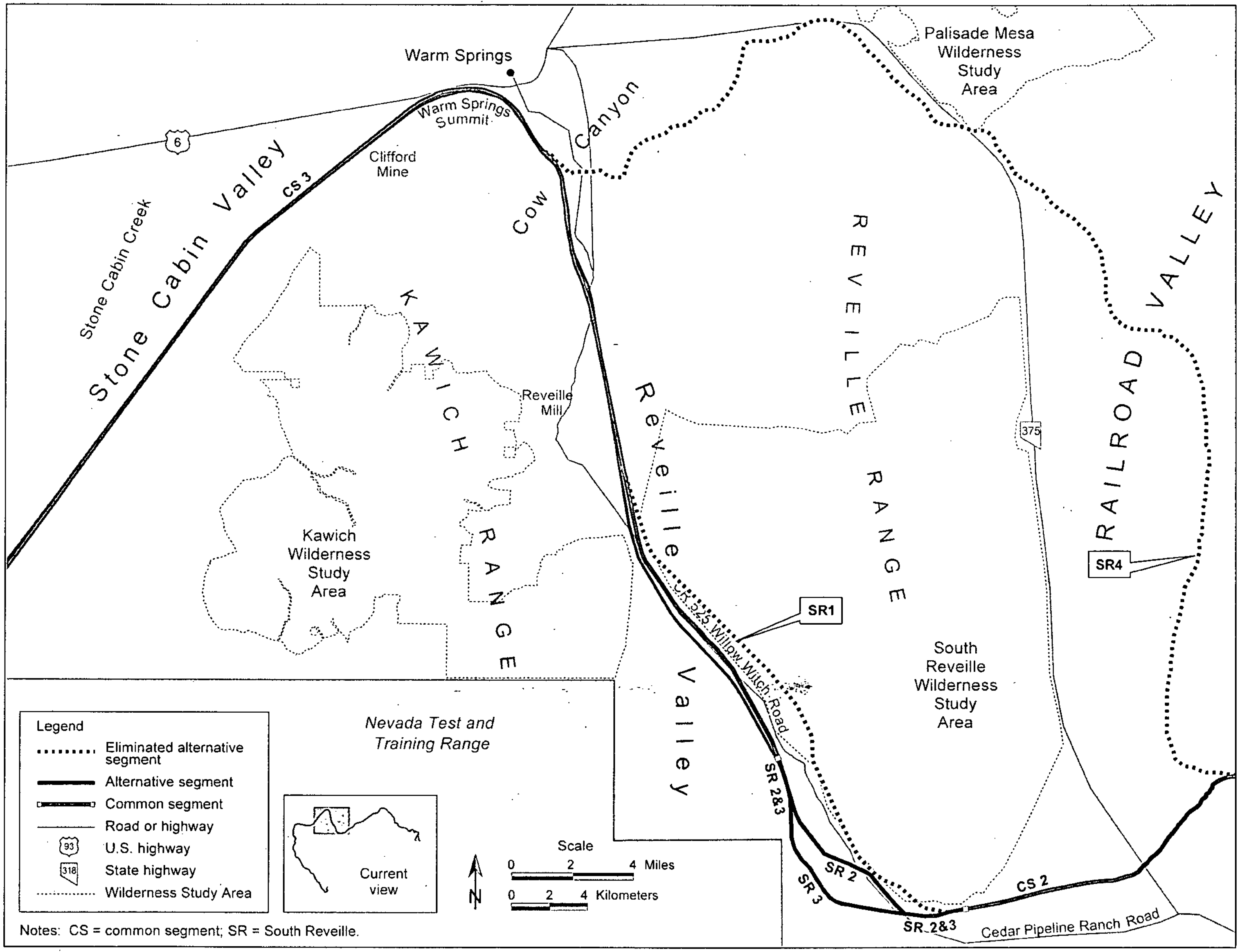


Figure C-10. Eliminated segments within Caliente map area D.

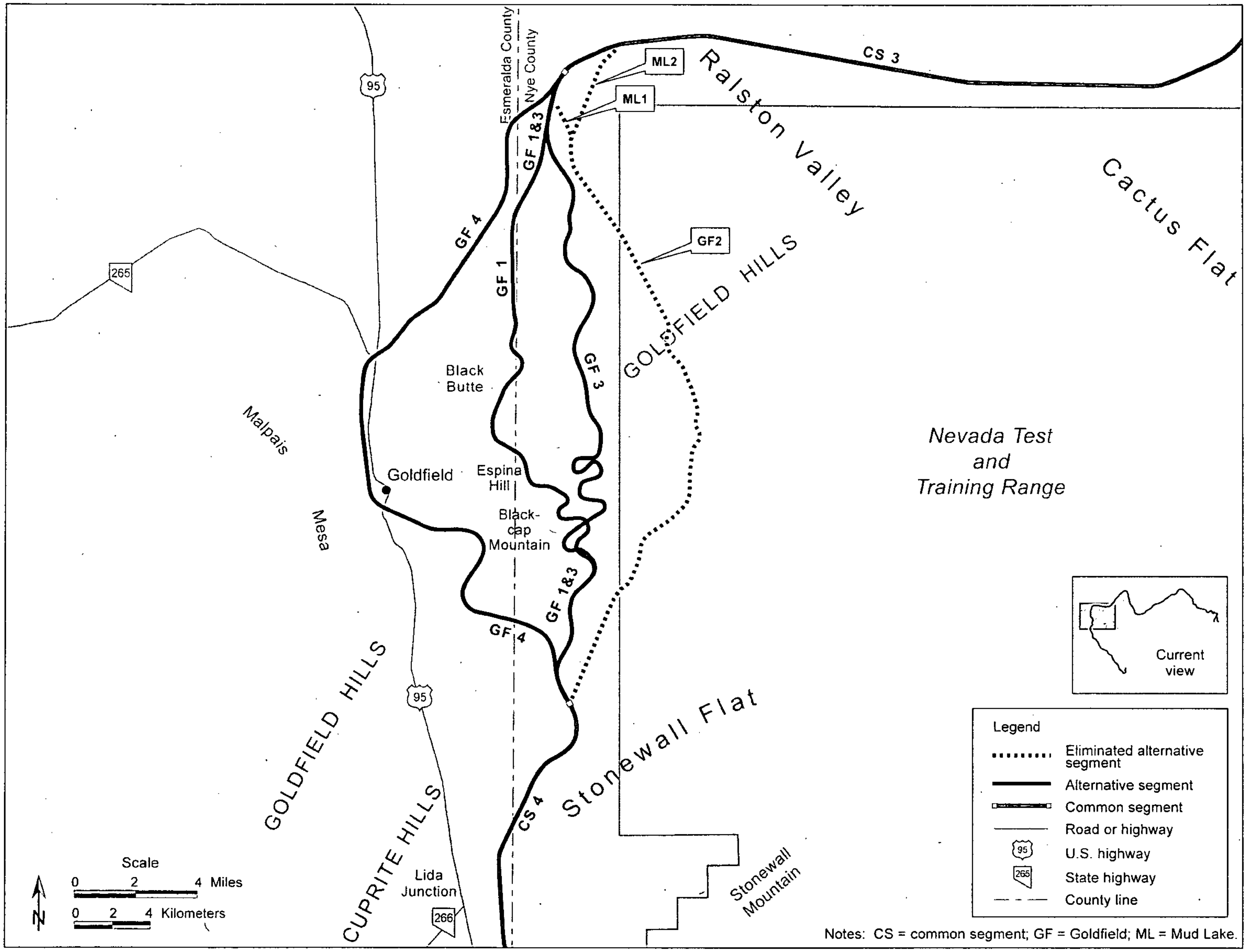


Figure C-11. Eliminated segments within Caliente map area E.

C.4.1.6 Goldfield Alternative Segments

DOE identified four alternative segments in the Goldfield area, Goldfield 1 through Goldfield 4 (Figure C-11). The Notice of Intent identified Goldfield 1 and Goldfield 2. DOE added Goldfield 3 and Goldfield 4 as a result of public scoping comments to avoid mineral resource areas to the north and east of Goldfield. The U.S. Air Force stated that a rail line would be incompatible with current uses of the Nevada Test and Training Range. Therefore, DOE eliminated Goldfield 2, which would enter the Nevada Test and Training Range, from detailed analysis. DOE then evaluated whether the remaining three Goldfield alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. Table C-7 provides a comparison of the key factors DOE used in this determination.

Table C-7. Comparison of possible alternative segments in the Goldfield area.[a]

Attribute	Goldfield 1	**Goldfield 2**	Goldfield 3	Goldfield 4
Length (kilometers)[b]	47	Alternative segment not evaluated because it would enter the Nevada Test and Training Range	50	53
Construction cost ($ millions)	203		231	249
Engineering factors	Would cut through complex, steep terrain. Meets engineering design criteria.		Would cut through complex, steep terrain. Meets engineering design criteria.	Would require short stretch at maximum allowable grade. Meets engineering design criteria
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination		Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segments are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

DOE found Goldfield alternative segments 1, 3, and 4 to have various construction and design complexities, such as grade-separated crossings, that would increase construction costs. Absent consideration of mitigation measures, each Goldfield alternative segment could also have the potential to impact mining interests and cultural resources. However, each alternative segment is feasible from a technical and economic standpoint and the environmental and land-use constraints do not warrant elimination of Goldfield 1, Goldfield 3, and Goldfield 4 from detailed analysis in the Rail Alignment EIS.

C.4.1.7 Bonnie Claire Alternative Segments

DOE identified three alternative segments in the Bonnie Claire area, Bonnie Claire 1 through Bonnie Claire 3 (Figure C-12). The Notice of Intent identified Bonnie Claire 1 and Bonnie Claire 2. As a result of public scoping comments that suggested avoiding the Nevada Test and Training Range and the Timbisha Shoshone Trust Lands near Scottys Junction, the Department modified Bonnie Claire 2 and identified a new alternative segment, Bonnie Claire 3. Additionally, based on comments from the Timbisha Shoshone Tribe that the rail line crossing their lands would be incompatible with their current and planned land uses, the Department eliminated Bonnie Claire 1 from detailed analysis in the Rail Alignment EIS. DOE then determined whether Bonnie Claire 2 and Bonnie Claire 3 would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and

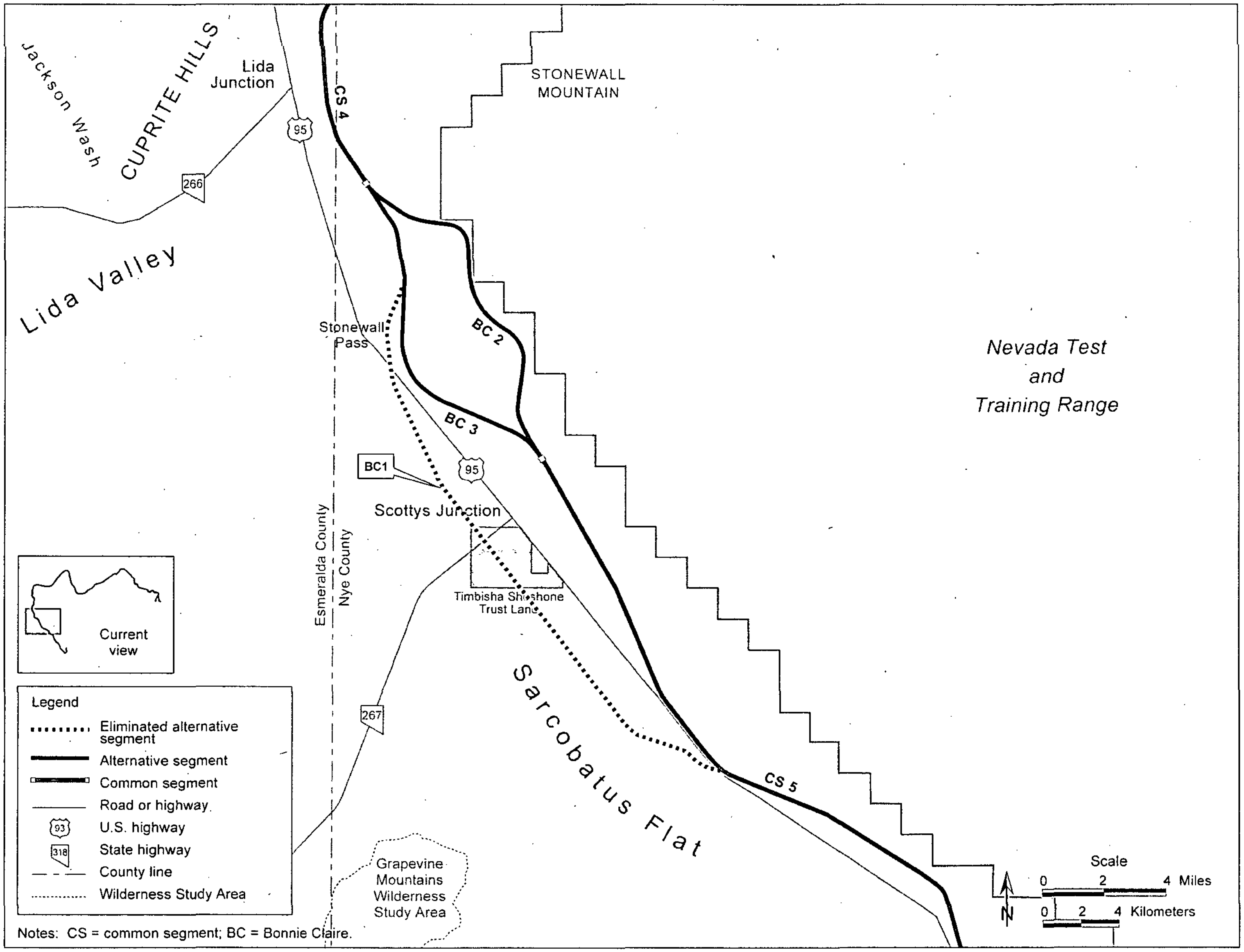


Figure C-12. Eliminated segments within Caliente map area F.

considered the environmental and land-use features associated with each. Based on this analysis, neither alternative segment was eliminated from detailed analysis in the Rail Alignment EIS. Table C-8 provides a comparison of the key factors DOE used in this determination.

Table C-8. Comparison of possible alternative segments in the Bonnie Claire area.a

Attribute	**Bonnie Claire 1**	Bonnie Claire 2	Bonnie Claire 3
Length (kilometers)[b]	Alternative segment not evaluated because it would cross Timbisha Shoshone Trust Lands.	20	20
Construction cost ($ millions)		96.9	74.9
Engineering factors		Meets engineering design criteria	Meets engineering design criteria
Key environmental and land-use features		Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segment are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

Bonnie Claire alternative segments 2 and 3 would have various construction and design complexities. Both alternative segments would require bridges and near maximum allowable grade that would increase construction costs. In addition, absent consideration of mitigation, both alternative segments would have the potential to impact various environmental resources, such as access to mining operations. However, each alternative segment appears to be feasible from a technical and economic standpoint.

C.4.1.8 Oasis Valley Alternative Segments

DOE identified three alternative segments in the Oasis Valley area, Oasis Valley 1, Oasis Valley 2, and Oasis Valley 3 (Figure C-13). The Notice of Intent identified Oasis Valley 1 and Oasis Valley 2. Oasis Valley 1 would cross less private land, but Oasis Valley 2 would be further from springs in the vicinity. In response to public scoping comments to avoid or minimize intrusion on certain parcels of land, DOE added Oasis Valley 3 for consideration. The Department then determined whether these three alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. Oasis Valley alternative segments 1, 2, and 3 appear to be feasible from a technical and economic standpoint. Oasis Valley 1 and 2 are immediately adjacent to one another and their engineering and construction factors would be similar. Both have similar land-use constraints, which do not warrant elimination of the alternative segments from detailed analysis. Because Oasis Valley 1 and Oasis Valley 2 have such similarities, DOE eliminated Oasis Valley 2 from detailed analysis. Table C-9 provides a comparison of the key factors DOE used in this determination.

Table C-9. Comparison of possible alternative segments in the Oasis Valley area.[a]

Attribute	Oasis Valley 1	**Oasis Valley 2**	Oasis Valley 3
Length (kilometers)[b]	10	Alternative segment not evaluated because engineering factors and environmental and land-use features similar to Oasis Valley 1	14
Construction cost ($ millions)	43.2		58.6
Engineering factors	Meets engineering design criteria		Meets engineering design criteria
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination		Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segment are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

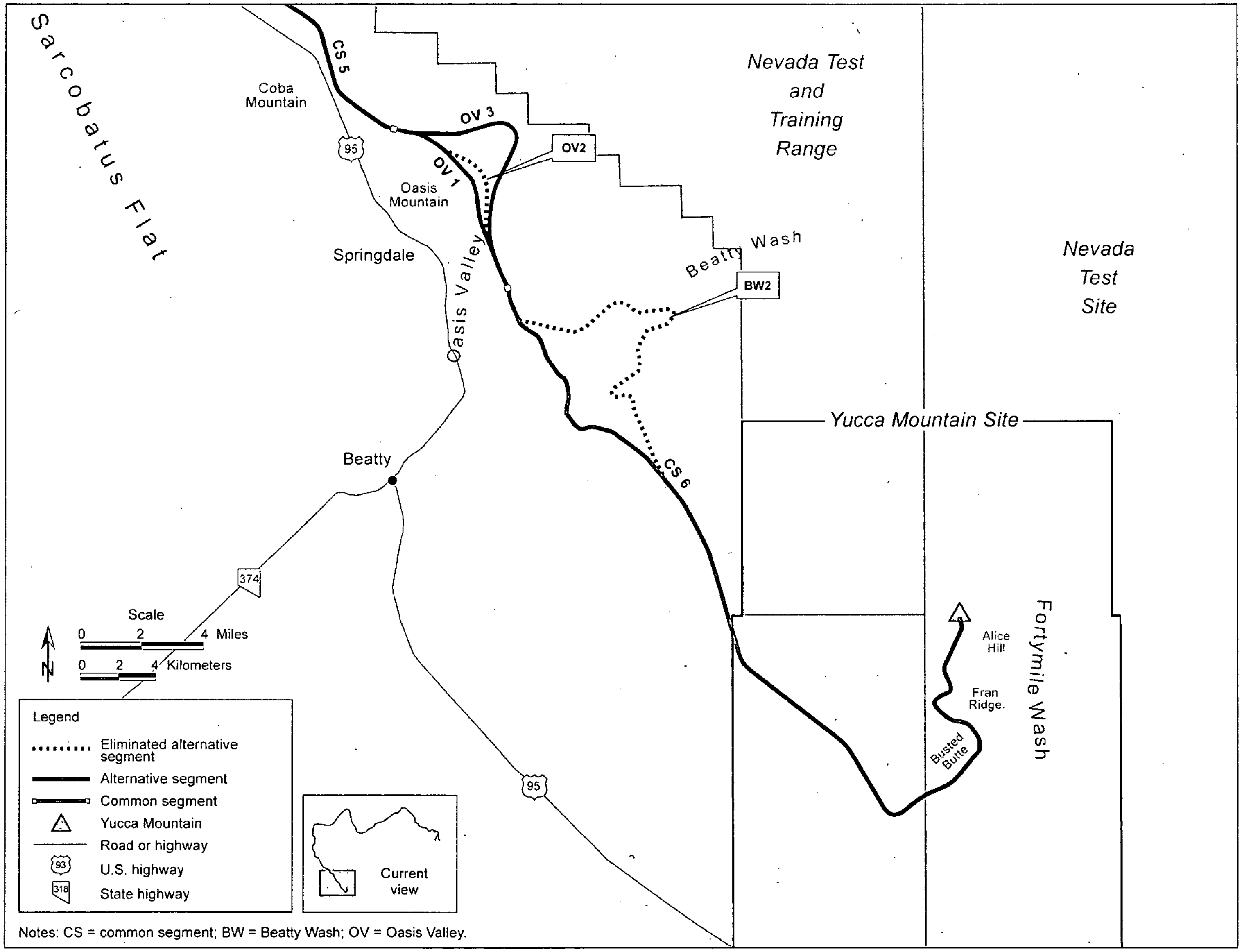


Figure C-13. Eliminated segments within Caliente map area G.

C.4.1.9 Beatty Wash Alternative Segments

In the Notice of Intent to prepare the Rail Alignment EIS (69 *FR* 18565, April 8, 2004), DOE identified two alternative segments in the Beatty Wash area, Beatty Wash 1 and Beatty Wash 2 (Figure C-13). DOE determined whether these two alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. Beatty Wash 2 would exceed design criteria for horizontal and vertical curvature. Therefore, DOE eliminated Beatty Wash 2 from detailed analysis in the Rail Alignment EIS. Table C-10 provides a comparison of the key factors DOE used in this determination. Eliminating Beatty Wash 2 resulted in only one Beatty Wash alternative segment for detailed analysis; thus, Beatty Wash 1 became an addition to common segment 6.

Table C-10. Comparison of possible alternative segments in the Beatty Wash area.[a]

Attribute	Beatty Wash 1	**Beatty Wash 2**
Length (kilometers)[b]	13	21
Construction cost ($ millions)	36	More than 60[c]
Engineering factors	Meets engineering design criteria	Exceeds design criteria for horizontal and vertical curvature
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segment are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.
c. Cost is listed as approximate because the computer based modeling system could not identify a viable alignment for construction estimating.

C.4.2 MINA RAIL ALIGNMENT ALTERNATIVE SEGMENTS ELIMINATED FROM DETAILED ANALYSIS

Figure C-14 shows the alternative segments DOE eliminated from consideration for the Mina rail corridor. Table C-11 identifies the alternative segments DOE identified in its Amended Notice of Intent (71 *FR* 60484, October 13, 2006) and alternative segments the Department added for consideration based on public comments. The table also summarizes the reasons DOE eliminated certain alternative segments from detailed analysis in the Rail Alignment EIS.

Table C-11. Mina rail alignment alternative segments identified and analyzed or eliminated from detailed analysis (page 1 of 2).

Map area	Alternative segments	Amended Notice of Intent	Scoping	Analyzed in detail or eliminated
Walker River Paiute Reservation area	Schurz 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Schurz 2	Alternative segment identified		Eliminated based on input from the Walker River Paiute Tribe.
	Schurz 3	Alternative segment identified		Eliminated based on input from the Walker River Paiute Tribe.

Table C-11. Mina rail alignment alternative segments identified and analyzed or eliminated from detailed analysis (page 2 of 2)

Map area	Alternative segments	Amended Notice of Intent	Scoping	Analyzed in detail or eliminated
Walker River Paiute Reservation area (continued)	Schurz 4		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	Schurz 5		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	Schurz 6		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
Montezuma Range area	Montezuma 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Montezuma 2	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Montezuma 3		Alternative segment identified	Analyzed in detail in the Rail Alignment EIS.
	Montezuma 4		Alternative segment identified	Eliminated because engineering criteria not met.
Bonnie Claire	Alternative segments and all factors are unchanged from Caliente analysis.			
Oasis Valley area	Oasis Valley 1	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Oasis Valley 3	Alternative segment identified		Analyzed in detail in the Rail Alignment EIS.
	Oasis Valley 4		Alternative segment identified	Eliminated because of land-use constraints and because engineering criteria not met.

C.4.2.1 Schurz Alternative Segments

The Amended Notice of Intent identified three alternative segments near Schurz, Schurz 1, Schurz 2, and Schurz 3 (Figure C-15). Feedback from the Walker River Paiute Tribe suggested that Schurz 2 and Schurz 3 not be considered viable alternatives to provide a bypass around Schurz, and DOE eliminated those alternative segments from detailed analysis in the Rail Alignment EIS. The Walker River Paiute Tribe identified several additional alternative segments where the rail line would cross Walker River Paiute Reservation lands. DOE determined whether the alternative segments would be technically feasible according to the design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. The results of these analyses indicated

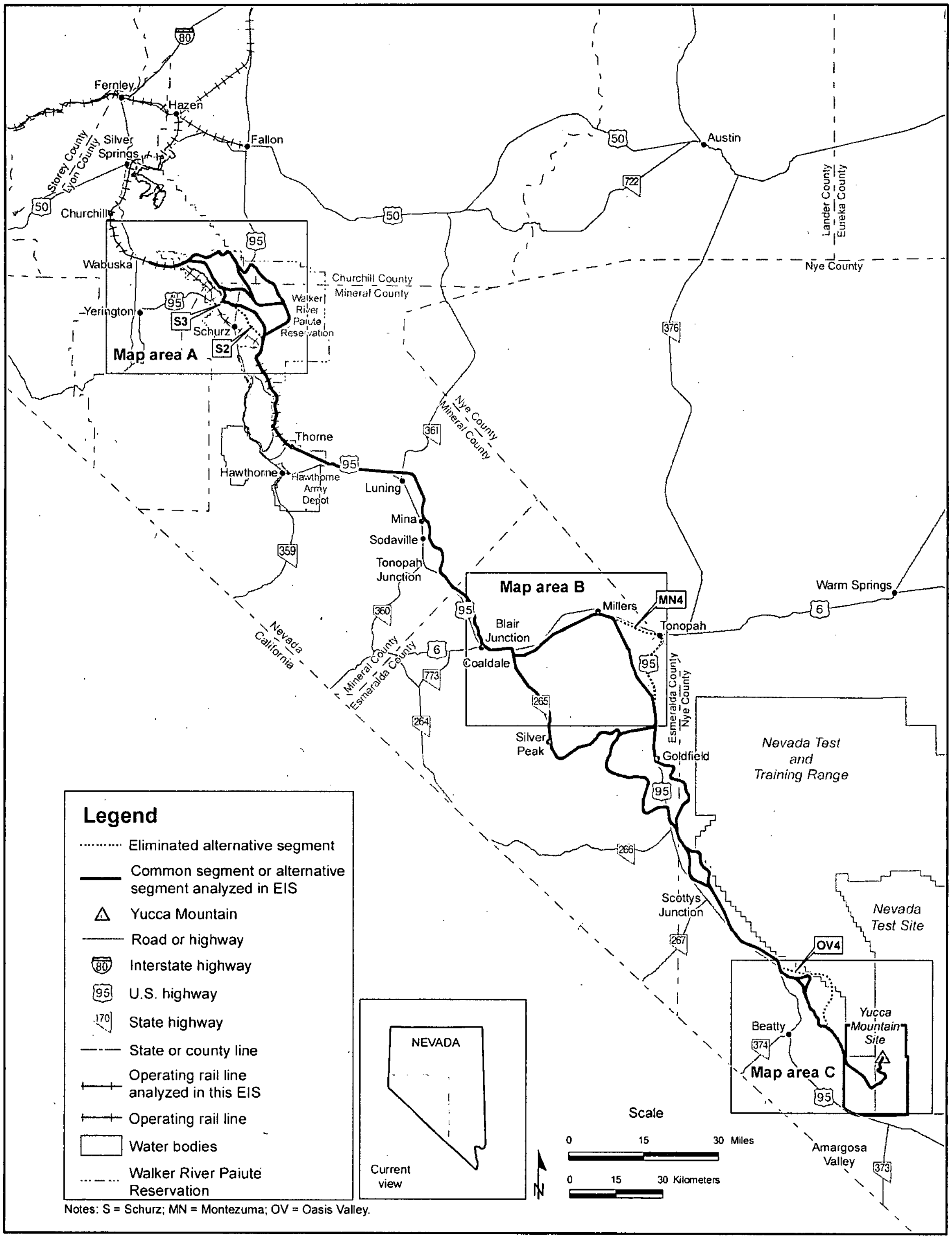


Figure C-14. Mina map key.

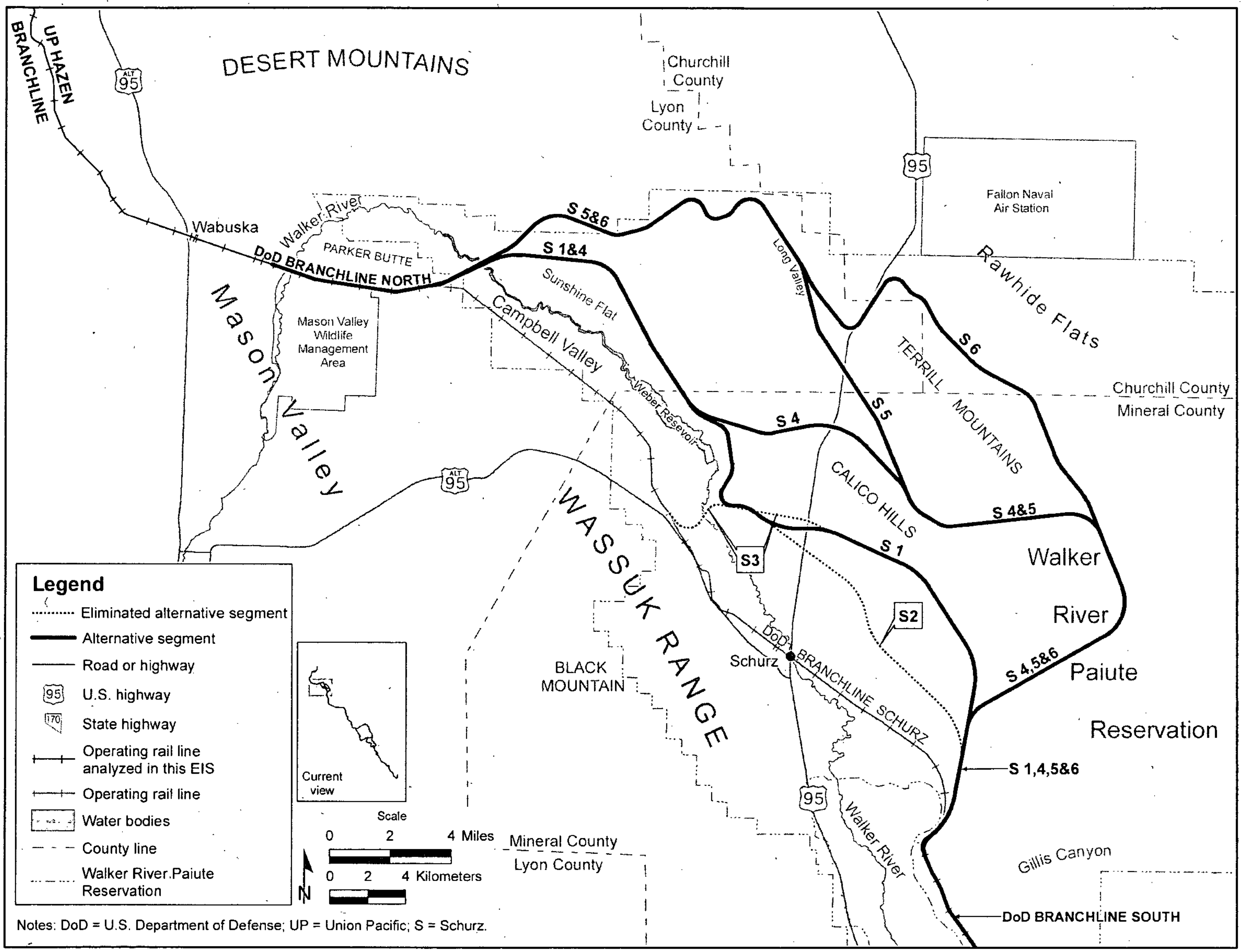


Figure C-15. Eliminated segments within Mina map area A.

that, while Schurz 4, Schurz 5, and Schurz 6 would each add additional length to the overall route and would present engineering challenges in several areas, each would meet engineering design criteria and present a viable alternative segment. Therefore, DOE added Schurz 4, 5, and 6 to the suite of alternative segments to be considered for detailed analysis in the EIS. Table C-12 lists the alternative segments considered.

Table C-12. Comparison of possible alternative segments in the Schurz area.[a]

Attribute	Schurz 1	**Schurz 2**	**Schurz 3**	Schurz 4	Schurz 5	Schurz 6
Length (kilometers)[b]	51.8	48.4	49.7	63.6	69	70.5
Construction cost (millions of $)	168	137	168	238	335	347
Engineering factors	Meets engineering design criteria	Eliminated due to input from the Walker River Paiute Tribe		Meets engineering design criteria	Meets engineering design criteria	Meets engineering design criteria
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination			No notable environmental or land-use constraints	No notable environmental or land-use constraints	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segments are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

C.4.2.2 Montezuma Alternative Segments

DOE considered four alternative segments in the Montezuma area (Figure C-16). The Amended Notice of Intent identified two alternative segments in the Montezuma Range area, Montezuma 1 and 2. Based on a public scoping comment to avoid communities along the Mina rail alignment, DOE added Montezuma alternative segment 3, which would avoid the communities of Goldfield and Silver Peak. Additionally, based on a comment received during public scoping, DOE examined Montezuma 4 as an alternative to constructing Montezuma 2. DOE determined whether the alternative segments would be technically feasible according to the engineering design criteria, estimated the cost of each alternative segment, and considered the environmental and land-use features associated with each. DOE determined that Montezuma 4 would impact private lands and that an alternative segment that meets the intent of the public scoping comment while meeting engineering and environmental criteria could not be derived. Therefore, DOE eliminated Montezuma 4 from detailed analysis in the Rail Alignment EIS. Table C-13 displays a comparison of the alternative segments considered.

Table C-13. Comparison of possible alternative segments in the Montezuma area.[a]

Attribute	Montezuma 1	Montezuma 2	Montezuma 3	**Montezuma 4**
Length (kilometers)[b]	118	119	140	145
Construction cost (in millions of $)	485	383	475	Not calculated because eliminated from consideration
Engineering factors	Meets engineering design criteria	Meets engineering design criteria, utilizes existing rail roadbed	Meets engineering design criteria, utilizes existing rail roadbed	Exceeds grade criteria
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination

a. Eliminated alternative segment are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

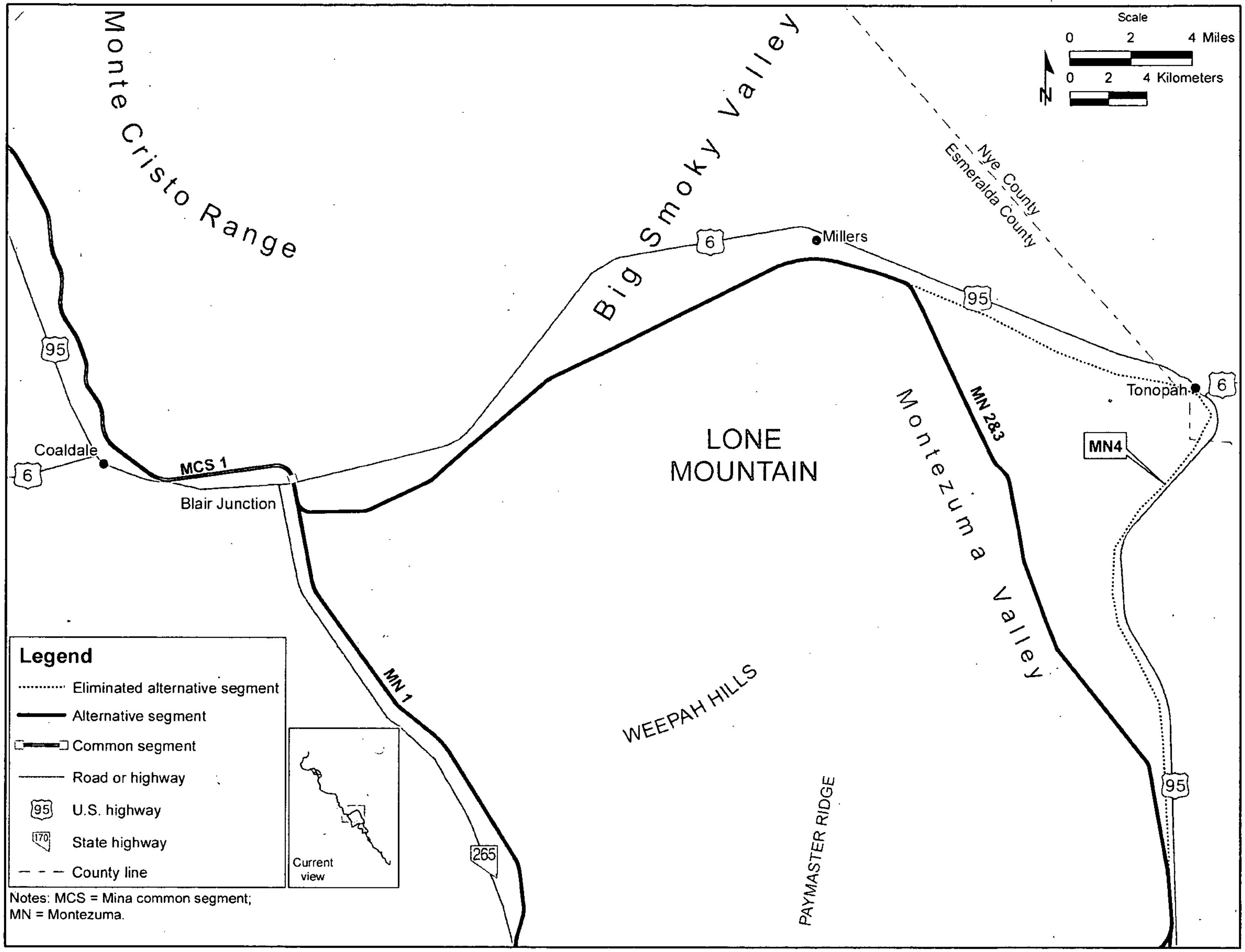


Figure C-16. Eliminated segments within Mina map area B.

C.4.2.3 Oasis Valley Alternative Segments

In total, DOE considered four alternative segments in Oasis Valley (Figure C-17). DOE identified Oasis Valley 1 and Oasis Valley 2 in its Notice of Intent. As discussed in Section C.5.1.8, during the Caliente rail alignment scoping process, DOE added Oasis Valley 3 to and eliminated Oasis Valley 2 from detailed analysis in the Rail Alignment EIS. The Amended Notice of Intent incorporated Oasis Valley 1 and Oasis Valley 3 by reference. Then, during scoping for the Mina rail alignment, one commenter suggested that DOE create an alternative segment in Oasis Valley to avoid private lands and eliminate perceived noise and vibration impacts. Based on this comment, DOE attempted to identify a feasible alternative segment, but could not without crossing onto the Nevada Test and Training Range. Table C-14 compares the Oasis Valley alternative segments DOE considered.

Table C-14. Comparison of possible alternative segments in the Oasis Valley area.[a]

Alternative segment	Oasis Valley 1	Oasis Valley 3	**Oasis Valley 4**
Length (kilometers)[b]	17.4	20.9	Alternative segment not included in the Rail Alignment EIS as it would enter the Nevada Test and Training Range
Construction cost (millions of $)	43.2	58.6	
Engineering factors	Meets engineering design criteria	Meets engineering design criteria	
Key environmental and land-use features	Environmental and land-use constraints do not warrant elimination	Environmental and land-use constraints do not warrant elimination	

a. Eliminated alternative segment are shown in **bold**.
b. To convert kilometers to miles, multiply by 0.62137.

C.5 Rail Alignment Refinement Process

DOE continued with development of alternative segments and common segments that were identified for detailed analysis, as described above. DOE used Caliente- and Mina-specific information from the computer models to refine and adjust common segment and alternative segment geometry to reflect rail design and engineering criteria. The Department transferred the information developed by the computer modeling system to a computer-aided-design (commonly called CAD) platform, and to alignment-specialty software. DOE used the CAD platform to create engineered drawings and used the software to develop each segment's horizontal and vertical geometry and estimate earthwork volumes such as cuts and fills. In developing this geometry, DOE considered U.S. Geological Survey topographic information, specific location information, cross-section templates, and engineering criteria (DIRS 176584-Nevada Rail Partners 2006, all).

DOE reviewed the alternative segments and common segments generated by software to identify the potential for further refinements. Further refinements were undertaken to improve operational functionality using industry standard practices recommended by the American Railway Engineering and Maintenance-of-Way Association and the Association of American Railroads.

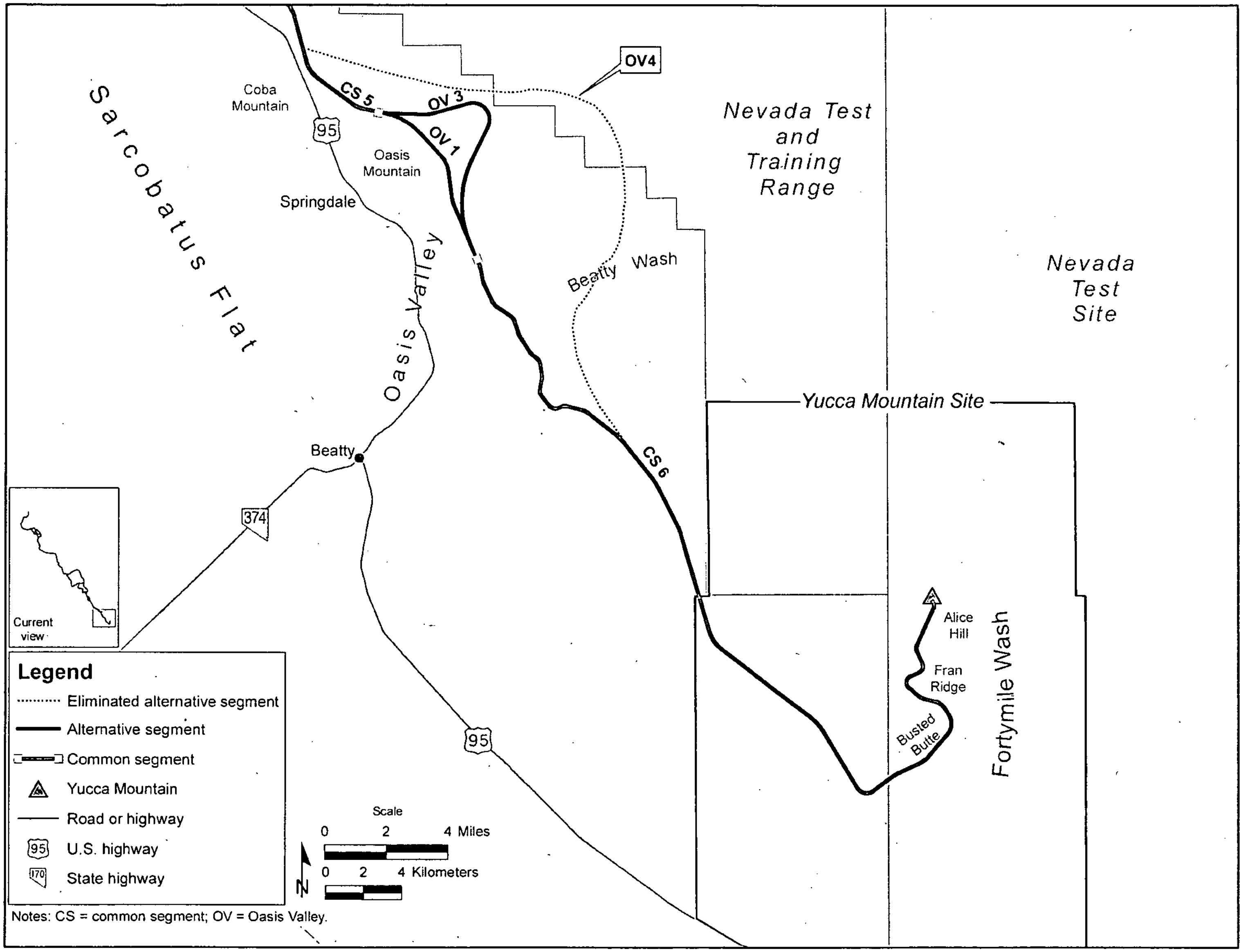


Figure C-17. Eliminated segments within Mina map area C.

C.5.1 CALIENTE RAIL ALIGNMENT REFINEMENT PROCESS

Caliente rail alignment refinements were limited in geographic extent and mostly consisted of shifting the track centerline. Figures C-18 and C-19 illustrate the alternative segment DOE refined the most, Oasis Valley 3. Figure C-18 illustrates the alternative segment before the conceptual design process, and Figure C-19 illustrates the results of this initial process. Figure C-20 shows the resulting conceptual alternative segments and common segments.

Following receipt of new aerial mapping and terrain models for the Caliente rail alignment, DOE again used computer-based modeling software to evaluate and refine the alternative segments and common segments in light of the new topographic data. The second refinement, called the Revision 1 alignment, typically altered the centerline location (compare to Revision 0) by several hundred feet, and occasionally a greater distance if environmental impacts would be reduced, thereby improving the feasibility of the rail alignment.

Water availability is the major issue determining the location and design of the rail alignment. It simultaneously affects engineering design, environmental effects, permitting constraints, and project costs. The principal factor affecting water demand is earthwork. Ninety percent of the water DOE would need for the project would be used to provide for compaction of embankment fill materials, and to control dust during excavation and other earth-moving activities. In the first refinement (Revision 0), DOE prepared the track profile with the objective of trying to balance earthwork quantities (that is, keeping the total excavation [cut] approximately equal to the placement of embankment [fill]). However, the conceptual design approach used during Revision 1 was to adjust the profile so that cut and fill would be reduced. By reducing fill, the water demand for embankment compaction would also be reduced (DIRS 176584-Nevada Rail Partners 2006, all).

DOE considered additional environmental and land-use factors in deriving the alternative segments and common segments that make up the Caliente rail alignment. This information included the identification of known areas of potential cultural resources impacts based on cultural resources surveys, and DOE adjusted the alternative segments and common segments to decrease or eliminate impacts in these areas.

C.5.2 MINA RAIL ALIGNMENT REFINEMENT PROCESS

DOE developed a conceptual Mina rail alignment and refined it using the modeling program and the process described in Section C.5. Figure C-21 shows the resulting conceptual alternative segments and common segments that make up the Mina rail alignment.

Following the receipt of new aerial mapping and terrain models, DOE again used software to evaluate the Mina alternative segments and common segments in light of the new topographic data, utilizing the same process and factors described for the Caliente rail alignment refinement process in C.5.1.

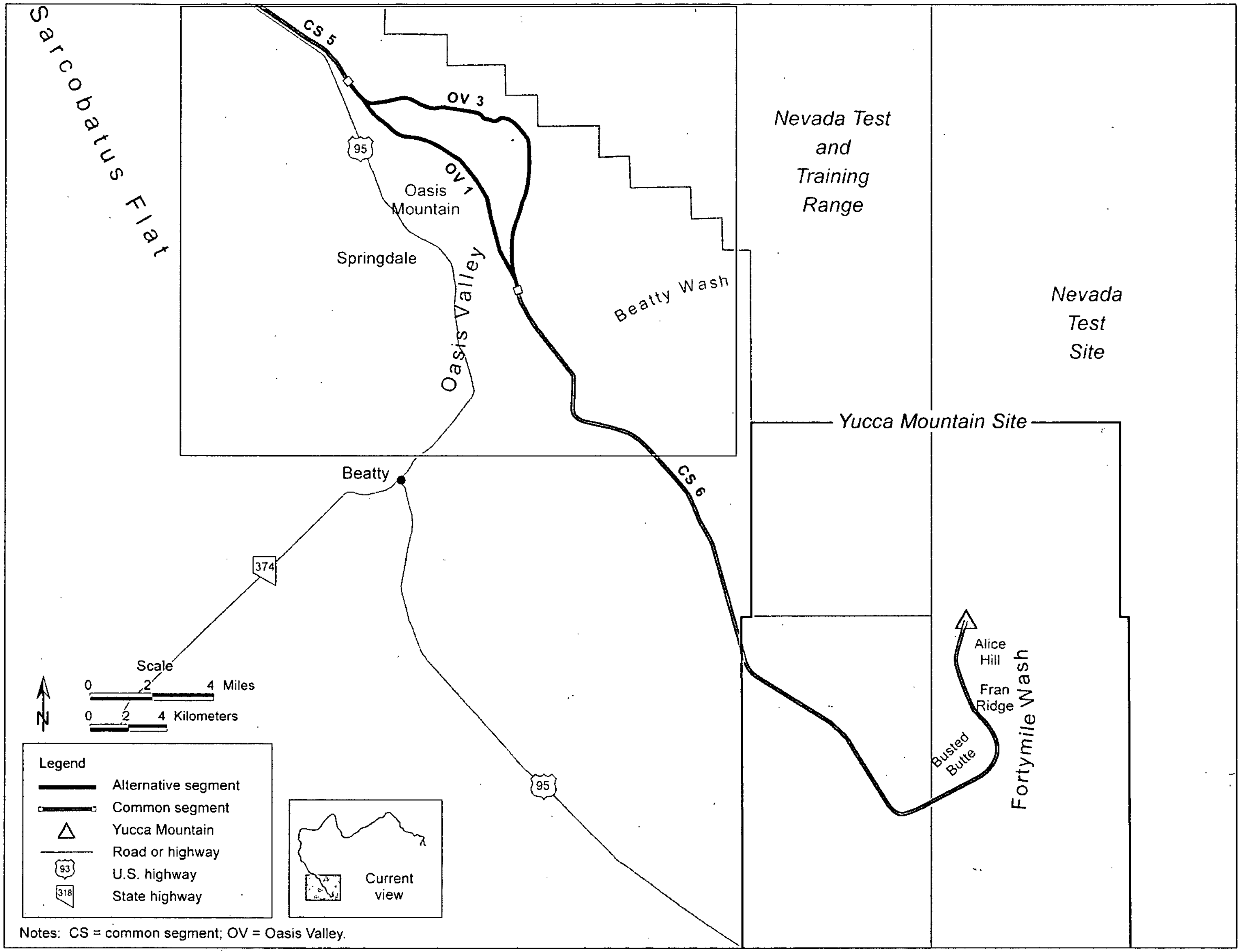


Figure C-18. The Oasis Valley alternative segments before the conceptual design process.

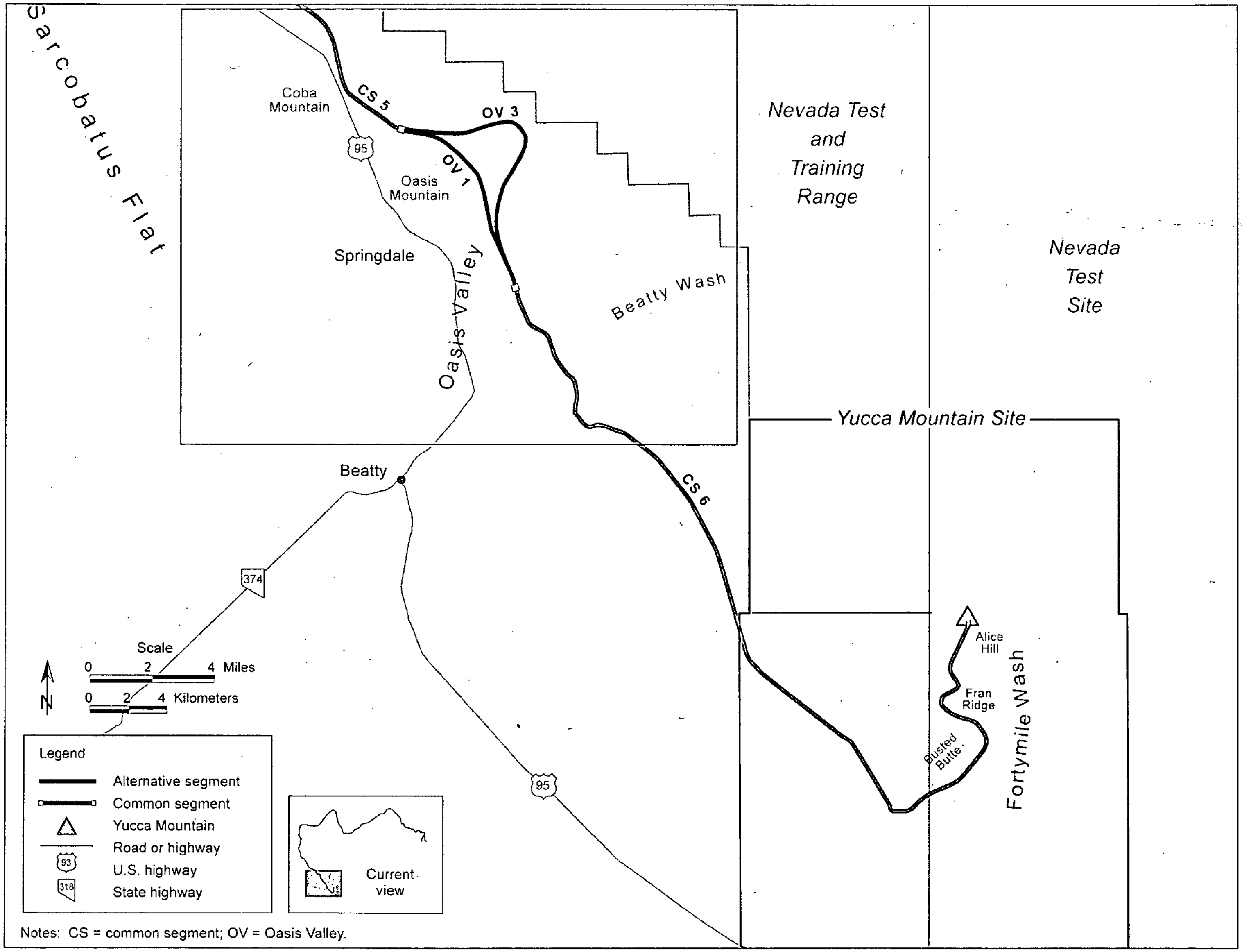


Figure C-19. The Oasis Valley alternative segments refined as a result of the conceptual design process.

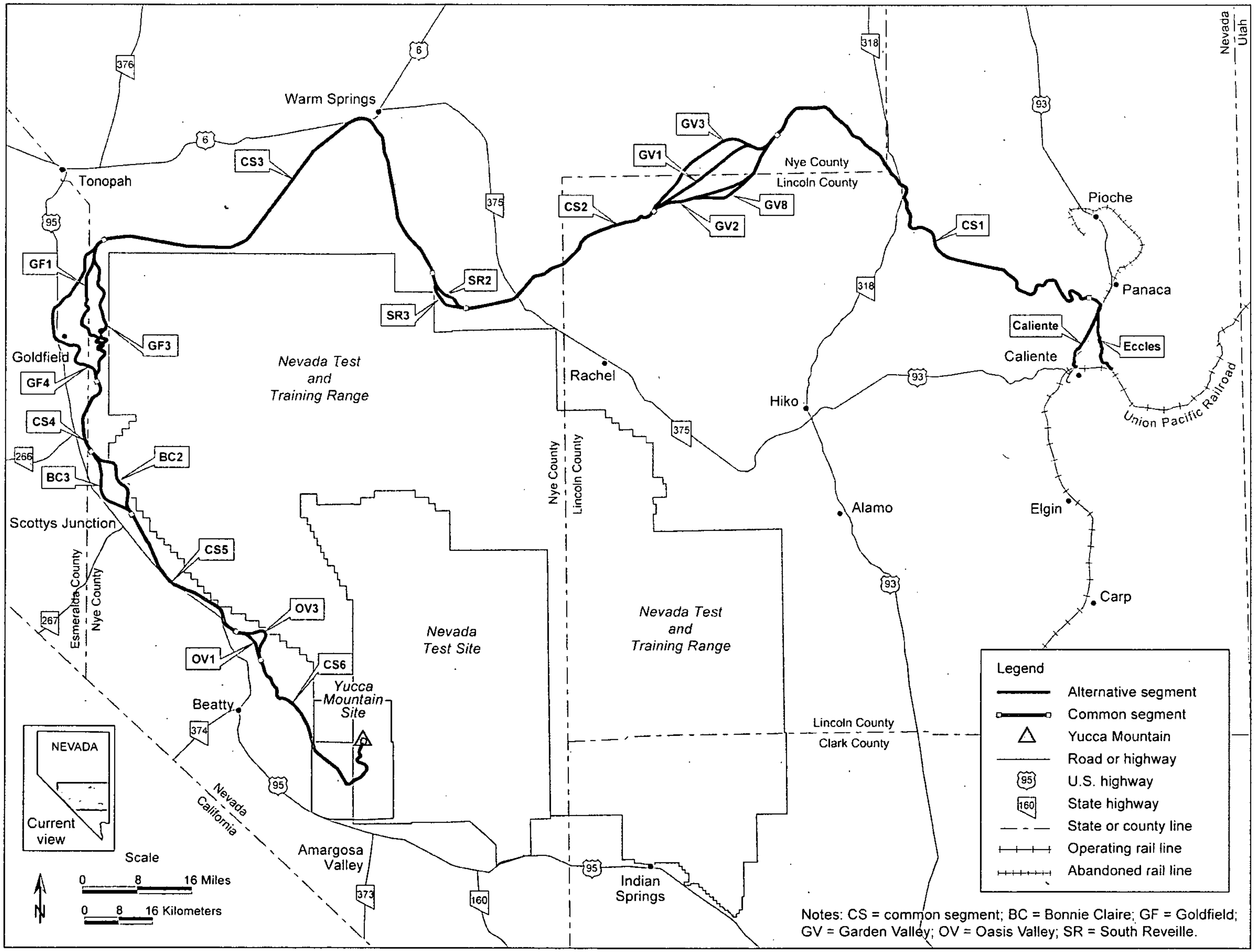


Figure C-20. Final alternative segments and common segments for analysis in the Rail Alignment EIS – Caliente rail alignment.

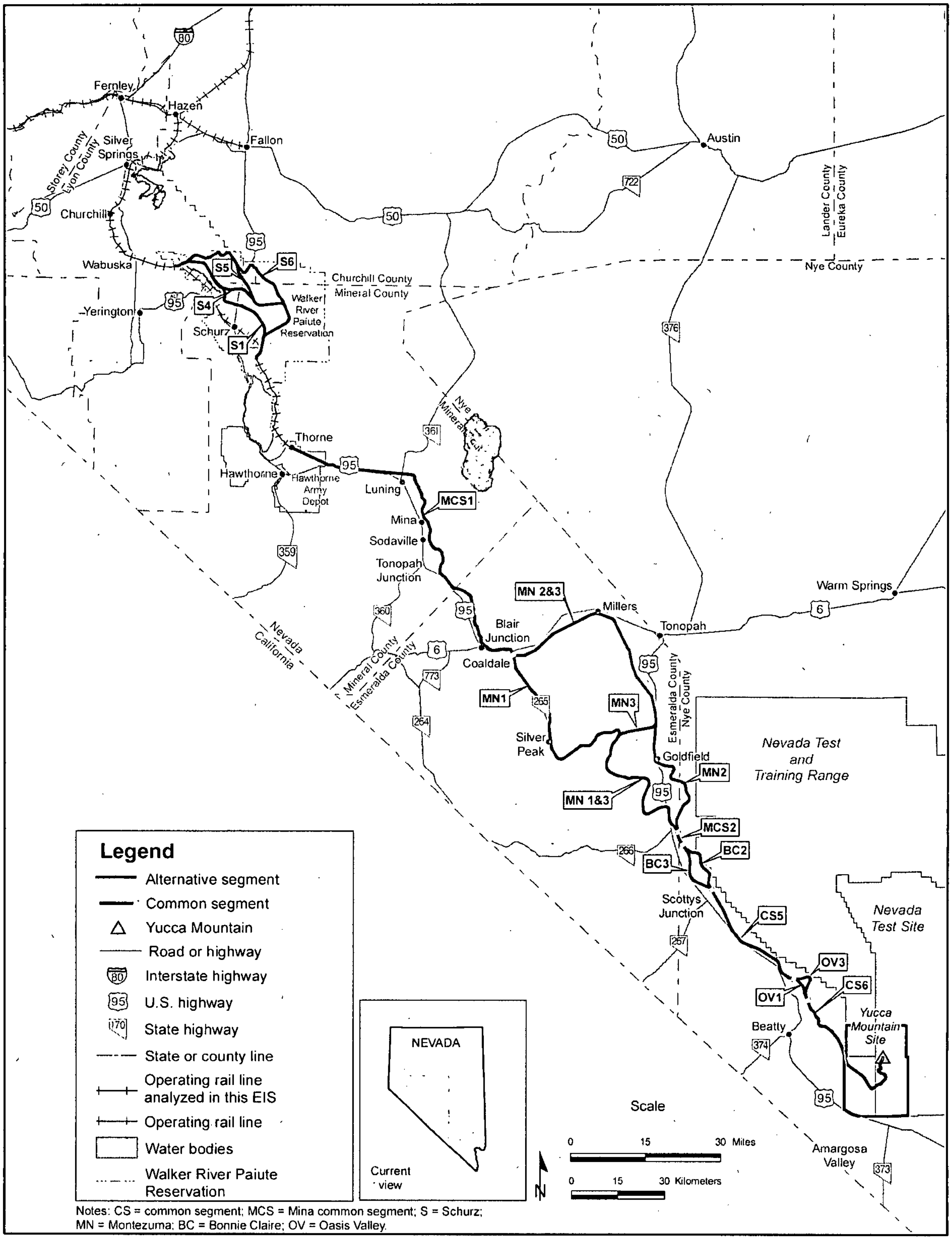


Figure C-21. Final alternative segments and common segments for analysis in the Rail Alignment EIS – Mina rail alignment.

C.6 Glossary

accessible environment	For this ***environmental impact statement*** (EIS), all points on Earth outside the surface and subsurface area controlled over the long term for the ***repository***, including the atmosphere above the controlled area.
accident	An unplanned sequence of events that results in undesirable consequences. Examples in this Rail Alignment EIS include an inadvertent release of radiation from the casks or hazardous materials from their containers; train derailments; vehicular accidents; and construction-related accidents that could affect workers.
air quality	A measure of the concentrations of pollutants, measured individually in the air.
alpha particle	A positively charged particle ejected spontaneously from the nuclei of some ***radioactive*** elements. It is identical to a helium nucleus and has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). See ***ionizing radiation.***
alternative	One of two or more actions, processes, or propositions, from which a decisionmaker will determine the course to be followed. The National Environmental Policy Act, as amended, states that in preparing an EIS, an agency "shall ... (s)tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources" [42 U.S.C. 4321, Title I, Section 102(E)]. The regulations of the Council on Environmental Quality that implement the National Environmental Policy Act indicate that the alternatives section is "the heart of the environmental impact statement (40 CFR 1502.14), and include rules for presentation of the alternatives, including no action, and their estimated impacts. The Rail Alignment EIS analyzes one alternative to the ***Proposed Action*** – the ***No-Action Alternative*** – and two implementing alternatives under the Proposed Action – the Caliente Implementing Alternative and the Mina Implementing Alternative – for constructing, operating, and possibly abandoning a ***railroad*** for the shipment of ***spent nuclear fuel*** and ***high-level radioactive waste*** for long-term ***disposal*** in a ***geologic repository*** at Yucca Mountain. Under the No-Action Alternative, the DOE would not construct the proposed railroad along the Caliente ***rail alignment*** or the Mina rail alignment.
alternative segment	Geographic region of the ***rail alignment*** for which multiple routes for the ***rail line*** have been identified. In the Rail Alignment EIS, there are different alignments identified within the Caliente ***rail corridor*** and the Mina rail corridor that could minimize or avoid environmental ***impacts*** and reduce construction complexities.

atomic mass	The mass of a neutral atom, based on a relative scale, usually expressed in atomic mass units. See ***atomic weight.***
atomic nucleus	See ***nucleus***.
atomic number	The number of ***protons*** in an atom's ***nucleus***.
atomic weight	The relative mass of an atom based on a scale in which a specific carbon atom (carbon-12) is assigned a mass value of 12. Also known as relative ***atomic mass***.
ballast	The coarse rock that is placed under the ***railroad*** tracks to support the railroad ties and improve drainage along the ***rail line***.
beta particle	A negatively charged ***electron*** or positively charged positron emitted from a ***nucleus*** during ***decay***. Beta decay usually refers to a radioactive transformation of a ***nuclide*** by electron emission, in which the ***atomic number*** increases by 1 and the mass number remains unchanged. In positron emission, the atomic number decreases by 1 and the mass number remains unchanged. See ***ionizing radiation.***
boiling-water reactor (BWR)	A ***nuclear reactor*** that uses boiling water to produce steam to drive a turbine.
common segment	Geographic region of the ***rail alignments*** for which a single route for the ***rail line*** has been identified.
cut	Cutting away from the top of a slope to fill in at the bottom, thereby providing a suitable grade for the rail ***roadbed***. See ***fill***.
decay (radioactive)	The process in which one ***radionuclide*** spontaneously transforms into one or more different radionuclides called decay products.
disposal (of spent nuclear fuel and high-level radioactive waste)	The ***emplacement*** in a ***repository*** of ***spent nuclear fuel***, ***high-level radioactive waste***, or other highly ***radioactive*** material with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste, and the ***isolation*** of such waste from the ***accessible environment***.
dose (radioactive)	The amount of ***radioactive*** energy taken into (absorbed by) living tissues. See ***effective dose equivalent***.
effective dose equivalent	Often referred to simply as ***dose***, it is an expression of the ***radiation*** dose received by an individual from external radiation and from ***radionuclides*** internally deposited in the body.
electron	A stable elementary particle that is the negatively charged constituent of ordinary matter.
emplacement	The placement and positioning of ***waste packages*** in the ***repository***.

environment	(1) Includes water, air, and land and all plants and humans and other animals living therein, and the interrelationship existing among these. (2) The sum of all external conditions affecting the life, development, and survival of an organism.
environmental impact statement (EIS)	A detailed written statement that describes: "...the environmental impact of the ***proposed action***; any adverse environmental effects which cannot be avoided should the proposal be implemented; ***alternatives*** to the proposed action; the relationship between local short-term uses of man's ***environment*** and the maintenance and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Preparation of an EIS requires a public process that includes public meetings, reviews, and comments, as well as agency responses to the public comments.
exposure (to radiation)	The condition of being subject to the effects of or potentially acquiring a ***dose*** of ***radiation***. The incidence of radiation on living or inanimate material by ***accident*** or intent. Background exposure is the exposure to natural ionizing radiation. Occupational exposure is the exposure to ionizing radiation that occurs during a person's working hours. Population exposure is the exposure to a number of persons who inhabit an area.
fill	The material used to fill the bottom of a slope with material cut away from the top of a slope, thereby providing a suitable grade for the rail ***roadbed***. (See ***cut***.)
fission products	***Radioactive*** or nonradioactive atoms produced by the ***fission*** of heavy atoms, such as uranium.
fuel assembly	A number of fuel elements held together by structural materials, used in a ***nuclear reactor***; sometimes called a fuel bundle.
gamma ray	The most penetrating type of radiant nuclear energy. It does not contain particles and can be stopped by dense materials such as concrete or lead. See ***ionizing radiation.***
geologic repository	A system for the ***disposal*** of ***radioactive*** waste in excavated geologic media, including surface and subsurface areas of operation, and the adjacent part of the geologic setting that provides ***isolation*** of the radioactive waste in a controlled area.
high-level radioactive waste	The highly ***radioactive*** material that resulted from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing, and any solid material derived from such liquid waste that contains ***fission products*** in sufficient concentrations.

impact	For an EIS, the positive or negative effect of an action (past, present, or future) on the natural ***environment*** (land use, ***air quality***, water resources, geological resources, ecological resources, aesthetic and scenic resources) and the human environment (***infrastructure***, economics, social, and cultural).
infrastructure	Basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communication systems.
ionizing radiation	(1) ***Alpha particles***, ***beta particles***, ***gamma rays***, ***X-rays***, ***neutrons***, high-speed ***electrons***, high-speed ***protons***, and other particles capable of producing ions. (2) Any ***radiation*** capable of displacing electrons from an atom or molecule, thereby producing ions.
irradiation	***Exposure*** to ***radiation***.
isolation	Inhibiting the transport of ***radioactive*** material so that the amounts and concentrations of this material entering the ***accessible environment*** stay within prescribed limits.
neutron	An atomic particle with no charge and an ***atomic mass*** of 1; a component of all atoms except hydrogen; frequently released as ***radiation***.
No-Action Alternative	Under the No-Action Alternative in the Rail Alignment EIS, DOE would not implement the ***Proposed Action*** in the Caliente rail corridor or the Mina rail corridor.
nuclear reactor	A device in which a nuclear fission chain reaction can be initiated, sustained, and controlled to generate heat or to produce useful ***radiation***.
nucleus	The central, positively charged, dense portion of an atom. Also known as ***atomic nucleus***.
nuclide	An atomic ***nucleus*** specified by its ***atomic weight***, ***atomic number***, and energy state; a ***radionuclide*** is a ***radioactive*** nuclide.
pressurized-water reactor (PWR)	A nuclear power ***reactor*** that uses water under pressure as a coolant. The water boiled to generate steam is in a separate system.
Proposed Action	The activity proposed to accomplish a federal agency's purpose and need. An EIS analyzes the environmental ***impacts*** of a proposed action, which includes the project and its related support activities. The Proposed Action in the Rail Alignment EIS, is to determine an alignment (within a corridor) and construct, operate, and potentially abandon a railroad in Nevada to transport spent nuclear fuel, high-level radioactive waste, and other Yucca Mountain project materials to a repository at Yucca Mountain.

proton	An elementary particle that is the positively charged component of ordinary matter and, together with the ***neutron***, is a building block of all atomic ***nuclei***.
radiation	Energy traveling through space. Radiation can be non-ionizing, like radio waves, ultraviolet radiation, or visible light, or ionizing, depending on its effect on atomic matter. As used in this Rail Alignment EIS "radiation" refers to ***ionizing radiation***. Ionizing radiation has enough energy to ionize atoms or molecules while non-ionizing radiation does not. Radioactive material is a physical material that emits ionizing radiation.
radioactive	Emitting ***radioactivity***.
radioactivity	(1) The spontaneous transformation of unstable atomic ***nuclei***, usually accompanied by the emission of ionizing ***radiation*** (e.g., such as ***alpha***, ***beta***, ***or gamma rays***). (2) The property of unstable nuclei in certain atoms (of elements such as uranium) to spontaneously emit ionizing radiation during nuclear transformations.
radionuclide	See ***nuclide***.
rail alignment	(1). A strip of land less than 400 meters (0.25 mile) wide through which the location of a rail line would be identified. (2) In this Rail Alignment EIS, the location of a ***rail line*** within a ***rail corridor***.
rail corridor	As used in this Rail Alignment EIS, a strip of land, 400 meters (0.25 mile) wide through which DOE would identify an alignment (***rail alignment***) for the construction of a ***rail line*** in Nevada to a ***geologic repository*** at Yucca Mountain.
rail line	An engineered feature incorporating the track, ties, ***ballast***, and ***subballast*** at a specific location.
railroad	A transportation system incorporating the rail line, operations support facilities, railcars, locomotives, and other related property and infrastructure.
reactor	See ***nuclear reactor***.
repository	See ***geologic repository***.
roadbed	The earthwork foundation upon which the track, ties, ***ballast***, and ***subballast*** of a ***rail line*** are lain.

spent nuclear fuel

Fuel that has been withdrawn from a ***nuclear reactor*** following ***irradiation***, the component elements of which have not been separated by reprocessing. For this project, this refers to (1) intact, nondefective ***fuel assemblies***, (2) failed fuel assemblies in ***canisters***, (3) fuel assemblies in canisters, (4) consolidated fuel rods in canisters, (5) nonfuel assembly hardware inserted in ***pressurized-water reactor*** fuel assemblies, (6) fuel channels attached to ***boiling-water reactor*** fuel assemblies, and (7) nonfuel assembly hardware and structural parts of assemblies resulting from consolidation in canisters.

subballast

A layer of crushed gravel that is used to separate the ***ballast*** and ***roadbed*** for the purpose of load distribution and drainage.

waste packages

Two thick metal cylinders, one nested within the other. The inner cylinder would be made of stainless steel to provide structural strength. The outer cylinder would be made of a nickel alloy that is highly resistant to corrosion.

withdrawal

Related to land use: Withholding an area of federal land from settlement, sale, location, or surface entry, under some or all of the general land laws, for the purpose of limiting activities under those laws to maintain other public values in the area or reserving the area for a particular public purpose or program.

Related to water resources: Water diverted from the ground or diverted from a surface-water source for use.

X-rays

Penetrating electromagnetic ***radiation*** having a wavelength much shorter than that of visible light. X-rays are identical to ***gamma rays*** but originate outside the ***nucleus***, either when the inner orbital ***electrons*** of an excited atom return to their normal state or when a metal target is bombarded with high-speed electrons.

C.7 References

180222	BSC 2006	BSC (Bechtel SAIC Company) 2006. Mina Rail Route Feasibility Study. Rev. 01. Las Vegas, Nevada: Bechtel SAIC Company. ACC: MOL.20070108.0027.
176584	Nevada Rail Partners 2006	Nevada Rail Partners 2006. Alignment Development Report Caliente Rail Corridor, Task 6: Route Alignment Definition, REV. 01A. Document No. NRP-R-SYSW-DA-0001-01A. Las Vegas, Nevada: Nevada Rail Partners. ACC: ENG.20060302.0017.

APPENDIX D

AESTHETIC RESOURCES

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APPENDIX D

AESTHETIC RESOURCES

This appendix supports the DOE analyses of potential impacts to aesthetic resources described in Sections 4.2.3 and 4.3.3 of the Rail Alignment EIS.

The U.S. Department of Energy (DOE) used U.S. Department of the Interior, Bureau of Land Management (BLM) methodologies to evaluate visual values along the Caliente and Mina rail alignments. The BLM considers visual resources when addressing aesthetic issues during BLM planning. These resources include natural or manmade physical features that give a landscape its character and value as an environmental factor. The BLM uses a visual resource management system to classify the aesthetic value of its lands and to set management objectives (DIRS 173052-BLM 1984, all).

Scenic quality is a measure of the visual appeal of a tract of land. Areas are rated based on key factors including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications (DIRS 101505-BLM 1986, Section II).

Sensitivity levels are a measure of public concern for scenic quality. Areas are ranked high, medium, or low based on types of users, amount of use, public interest, adjacent land uses, and whether they are special areas (DIRS 101505-BLM 1986, Section III).

The BLM classification of visual resource value, the visual resource inventory, involves assessing visual resources and assigning them to one of four visual resource management classes based on three factors: ***scenic quality***, visual sensitivity (***sensitivity levels***), and distance from travel or observation points (DIRS 101505-BLM 1986, all). The BLM uses a combination of the ratings of these three factors to assign a visual resource inventory class to a piece of land, ranging from Class I to Class IV, with Class I representing the highest visual values. Each visual resource class is subsequently associated with a management objective, defining the way the land may be developed or used. Each BLM district assigns visual resource management classes to its lands during the resource management planning process. Table D-1 lists the BLM management objectives for visual resource classes.

The BLM uses visual resource contrast ratings to assess the visual impacts of proposed projects and activities on the existing landscape (DIRS 173053-BLM 1986, all). The Bureau looks at basic elements of design to determine levels of contrast created between a proposed project and the existing ***viewshed.*** Depending on the visual resource management objective for a particular location, varying levels of contrast are acceptable.

Contrast ratings are determined from locations called key observation points, which are usually along commonly traveled routes such as highways or frequently used county roads or in communities. To identify key observation points along the Caliente and Mina rail alignments, DOE considered the following factors: angle of observation, number of viewers, how long the project would be in view, relative project size, season of use, and light conditions. BLM guidance (DIRS 173053-BLM 1986, Section IIC) recommends that key observation points for linear projects, such as the proposed railroad, include the following:

- Most-critical viewpoints (for example, views from communities at road crossings)
- Typical views encountered in representative landscapes, if not covered by critical viewpoints
- Any special project or landscape features such as river crossings and substations

Table D-1. BLM visual resource management classes and objectives.[a]

Visual resource class	Objective	Acceptable changes to land
Class I	Preserve the existing character of the landscape.	Provides for natural ecological changes but does not preclude limited management activity. Changes to the land must be small and must not attract attention.
Class II	Retain the existing character of the landscape.	Management activities may be seen but should not attract the attention of the casual observer. Changes must repeat the basic elements of form, line, color, and texture of the predominant natural features of the characteristic landscape.
Class III	Partially retain the existing character of the landscape.	Management activities may attract attention but may not dominate the view of the casual observer. Changes should repeat the basic elements in the predominant natural features of the characteristic landscape.
Class IV	Provides for management activities that require major modifications of the existing character of the landscape.	Management activities may dominate the view and be the major focus of viewer attention. An attempt should be made to minimize the impact of activities through location, minimal disturbance, and repeating the basic elements.

a. Source: DIRS 101505-BLM 1986, Section V.B.

D.1 Caliente Rail Alignment

This section provides photographs taken from key observation points along the Caliente rail alignment. For some views, DOE has added simulations to the baseline photographs to show how track, trains, or facilities would appear. Figure D-1 shows the locations of the key observation points and the BLM visual resource management classifications of the lands in the viewsheds. Figures D-2 through D-83 are photographs along the Caliente rail alignment.

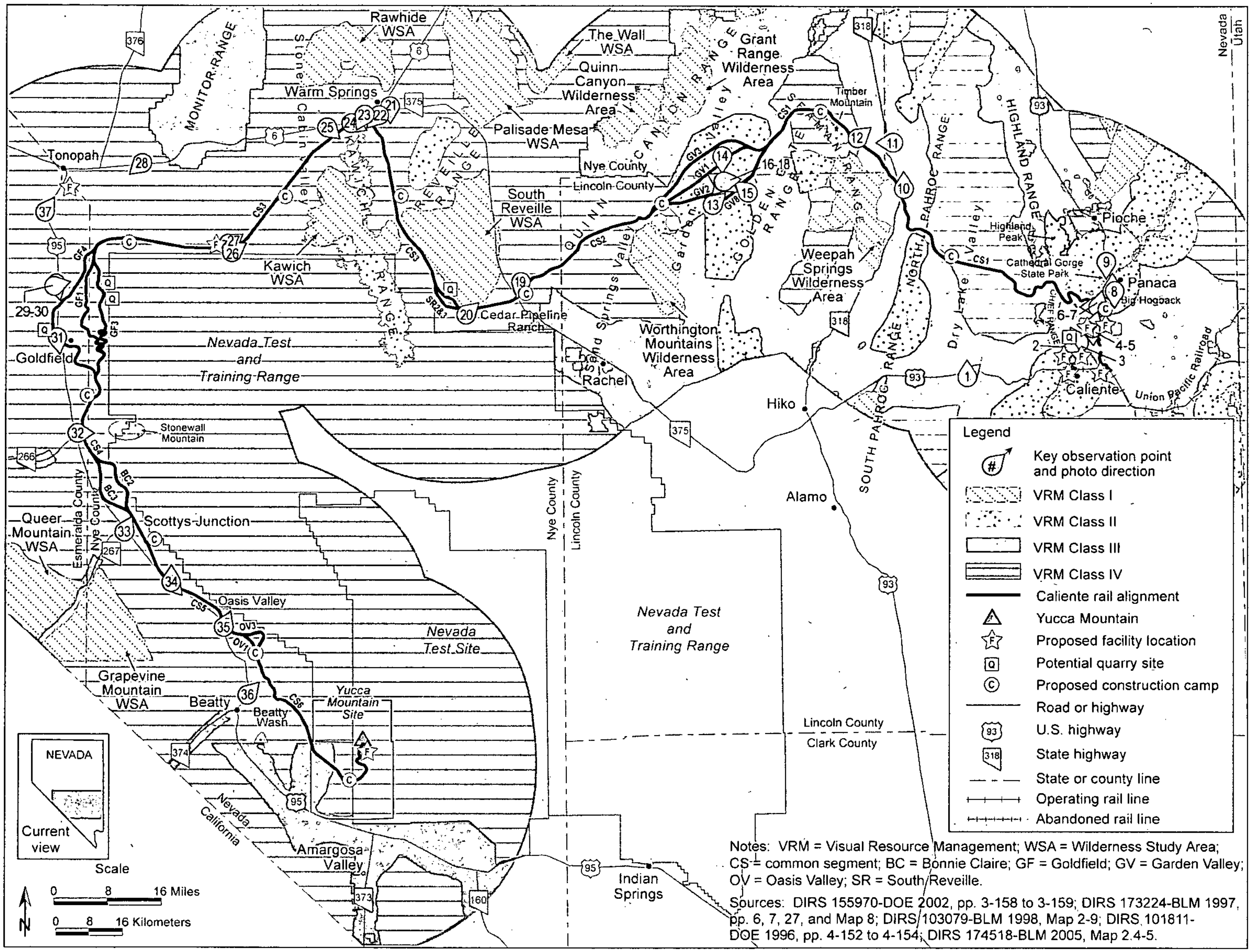


Figure D-1. Visual resource management classifications and key observation points along the Caliente rail alignment.

Figure D-2. View northeast from key observation point 1 at U.S. Highway 93 in Dry Lake Valley toward the Burnt Springs and Chief Ranges. Rail line would not be visible because it would be screened by Burnt Springs Range.

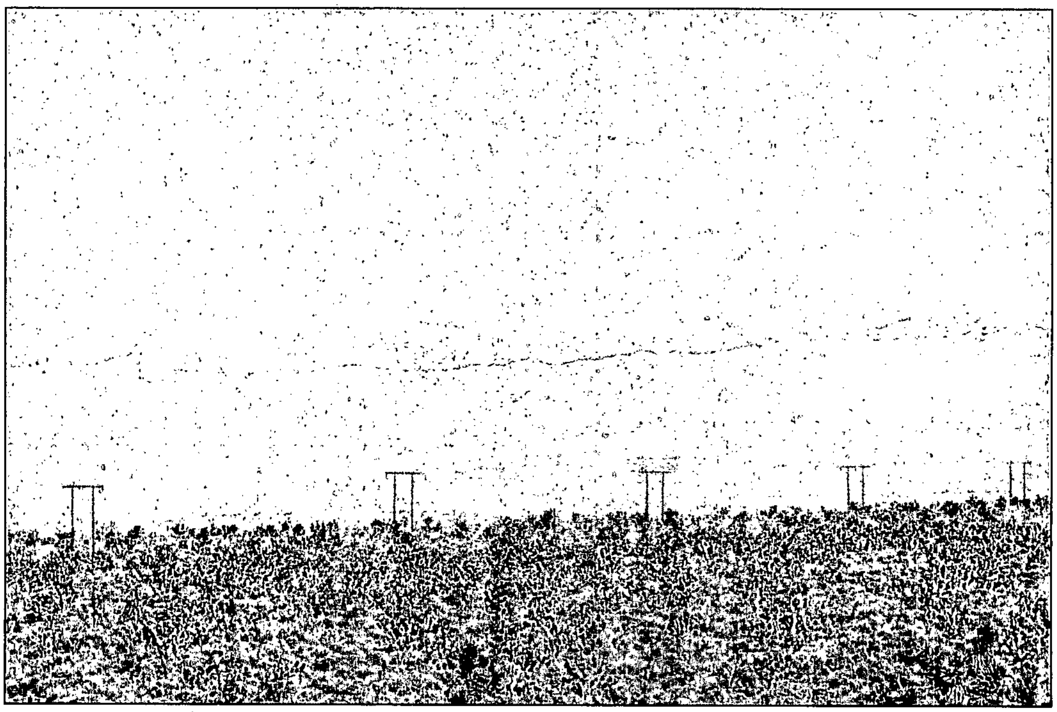


Figure D-3. View north from key observation point 1 on U.S. Highway 93 in Dry Lake Valley. Highland Range on right. Rail line would not be visible in valley because of distance.

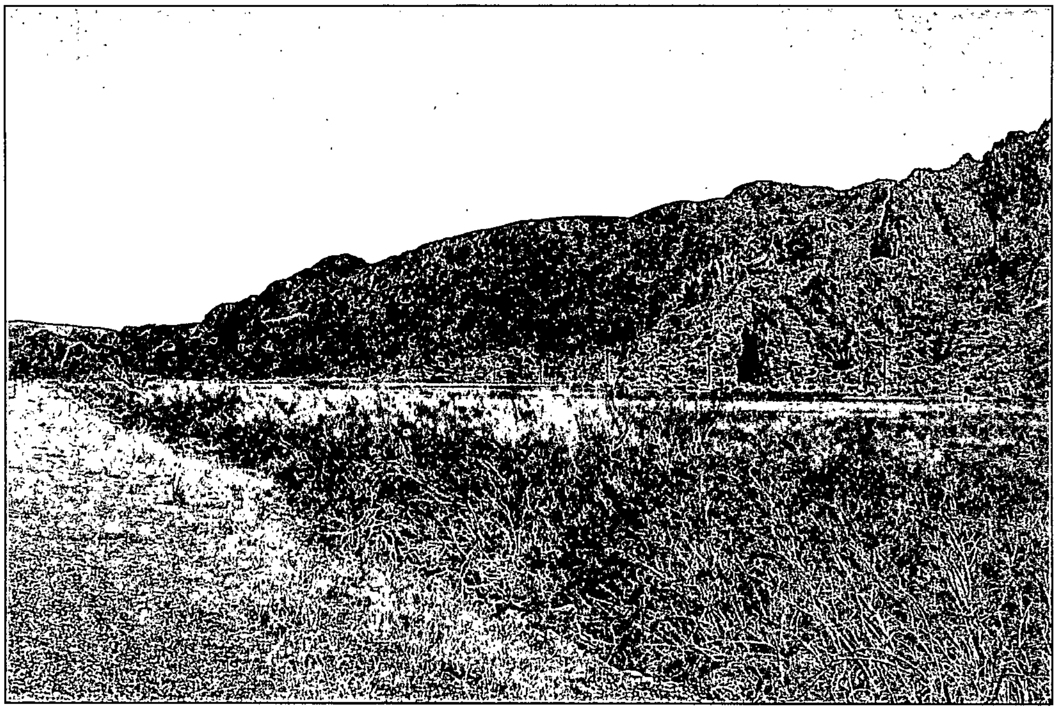


Figure D-4. View north from key observation point 2 on U.S. Highway 93 toward location of Staging Yard Caliente-Indian Cove option.

Figure D-5. Simulation of Staging Yard Caliente-Indian Cove option in view north from key observation point 2. Office buildings would be visible in background.

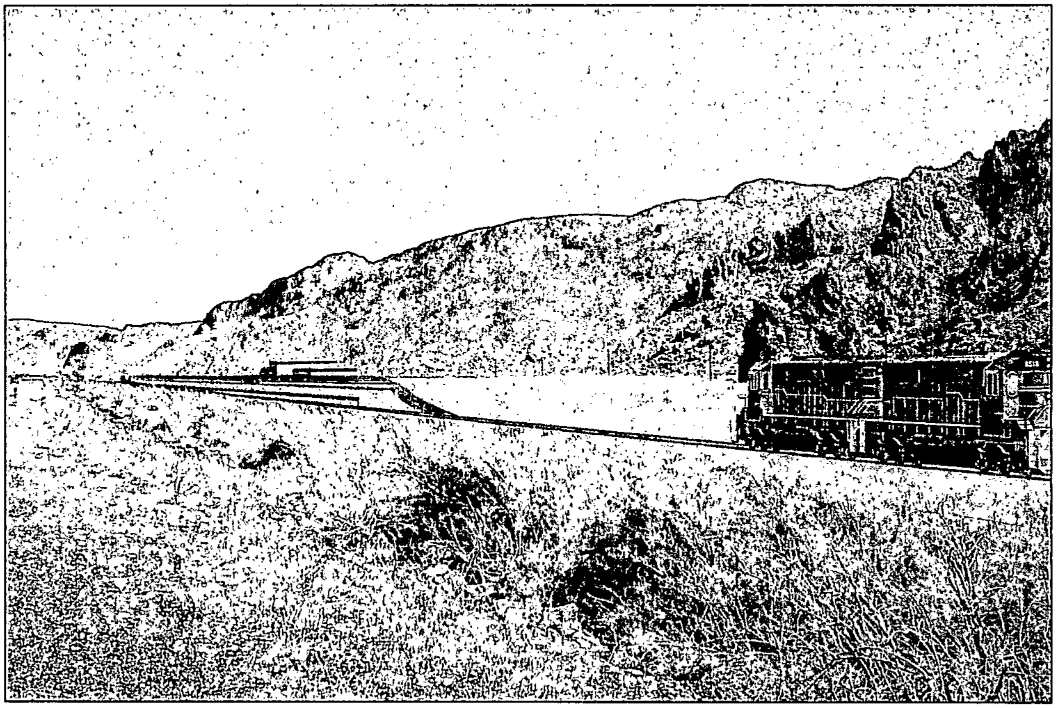


Figure D-6. Simulation of train approaching Staging Yard Caliente-Indian Cove option in view north from key observation point 2.

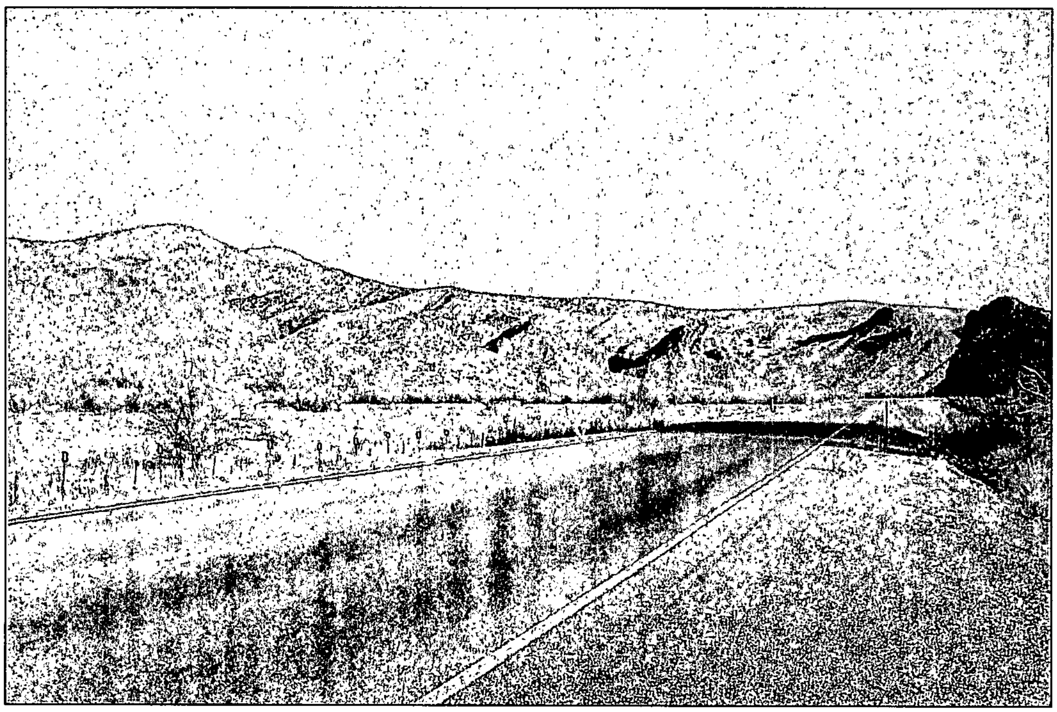


Figure D-7. View north-northwest from key observation point 3 on U.S. Highway 93. Rock conveyor to deliver ballast to Staging Yard Caliente-Indian Cove option would cross over highway here. (See Figure D-9 for a simulation of conveyor appearance.)

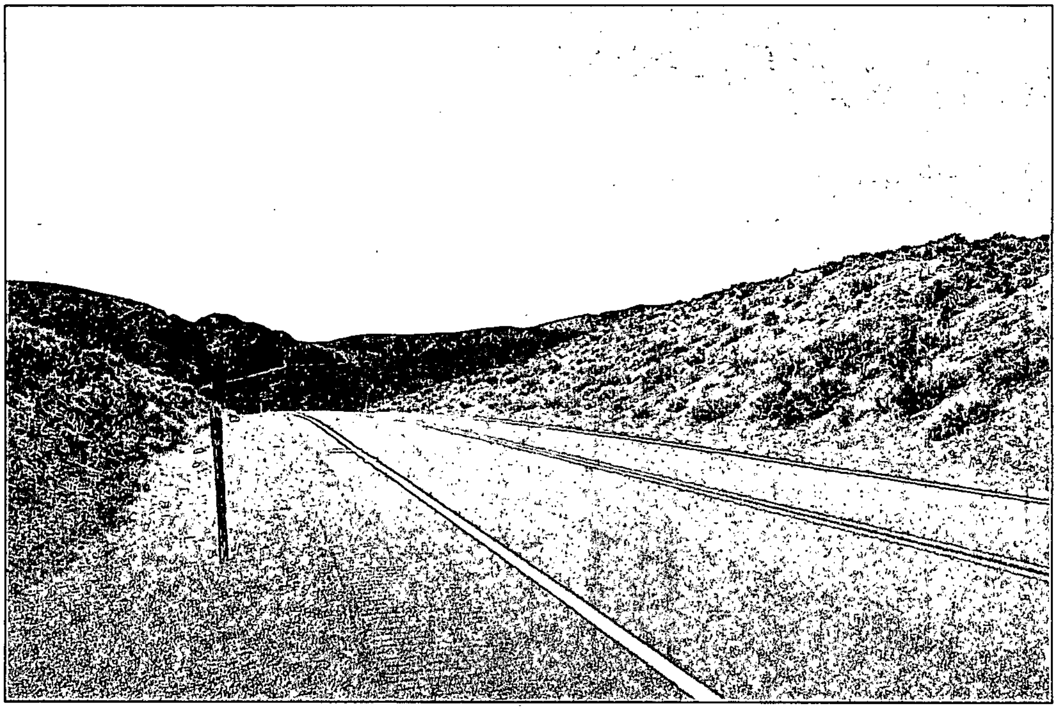


Figure D-8. View south-southwest from key observation point 4 on U.S. Highway 93. Rock conveyor to deliver ballast to Staging Yard Caliente-Upland option would cross over highway here.

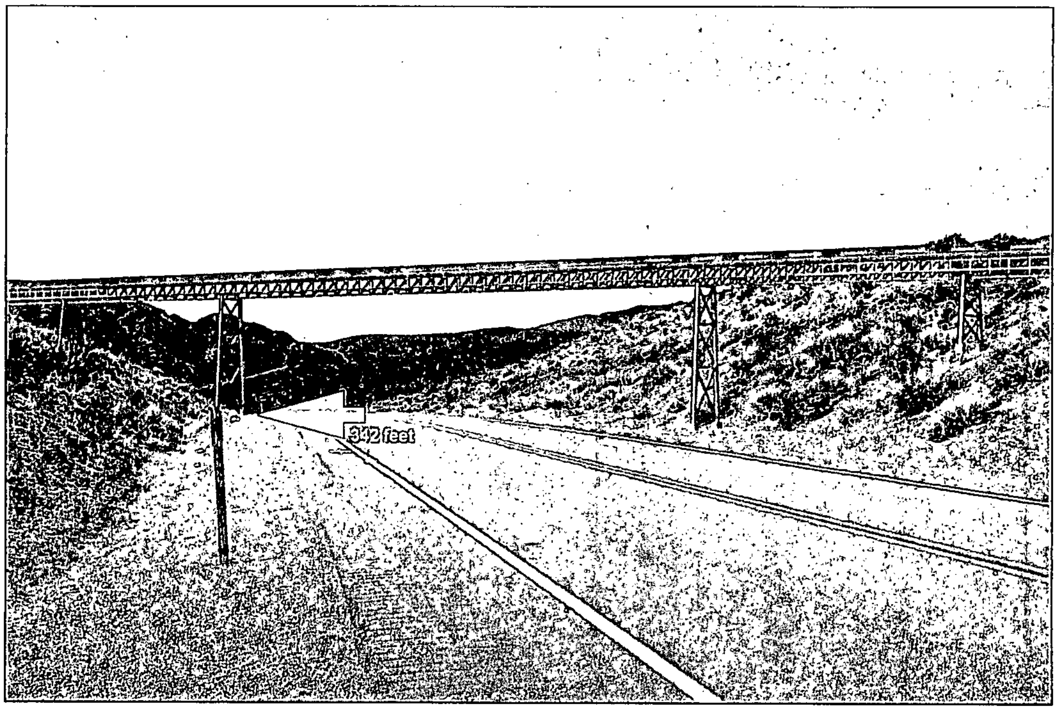


Figure D-9. Simulation of rock conveyor in view south-southwest from key observation point 4.

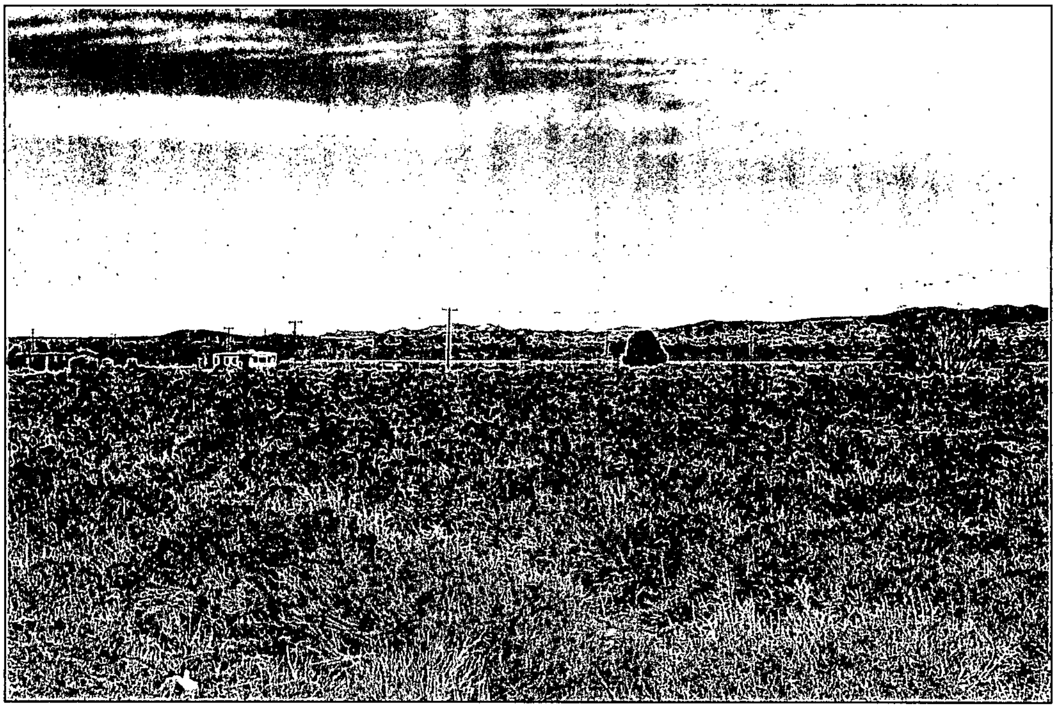


Figure D-10. View north-northeast from key observation point 5 on U.S. Highway 93 over location of Staging Yard Caliente-Upland option. Note existing buildings.

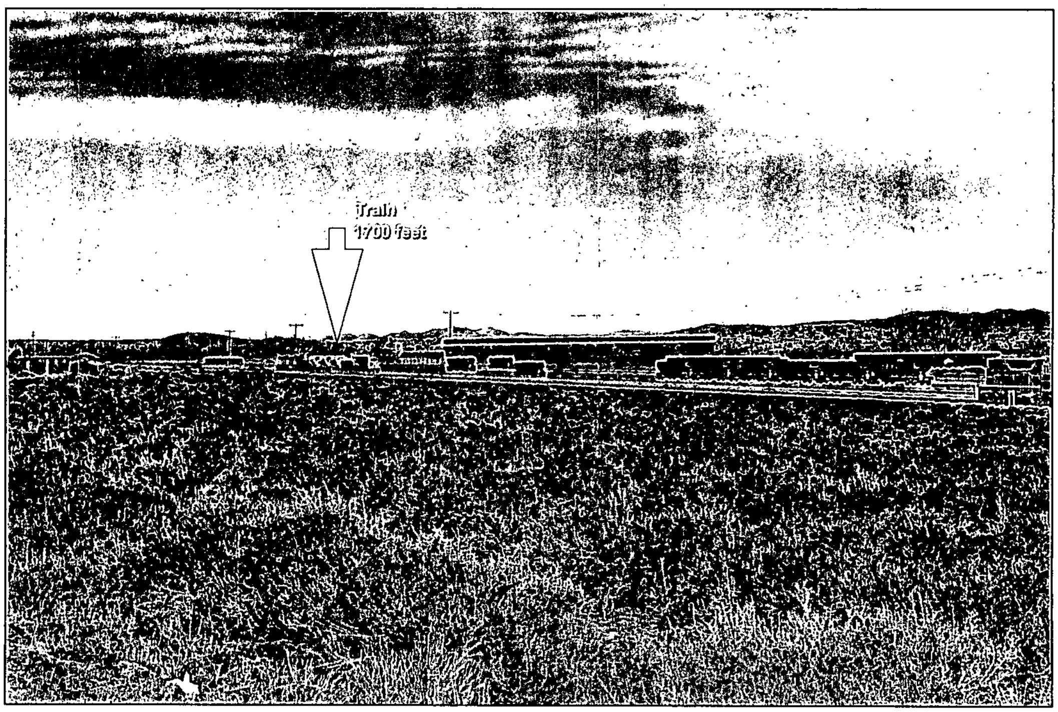


Figure D-11. Simulation of Staging Yard Caliente-Upland option in view north-northeast from key observation point 5.

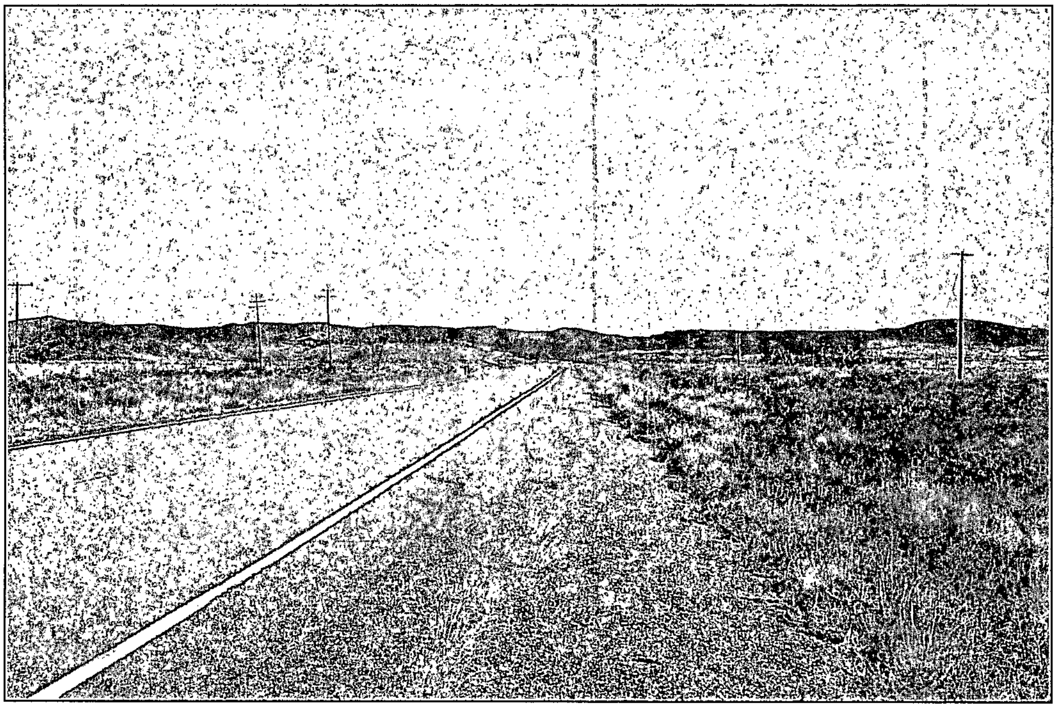


Figure D-12. View north-northeast from key observation point 6 on U.S. Highway 93 at location where rail line would cross highway.

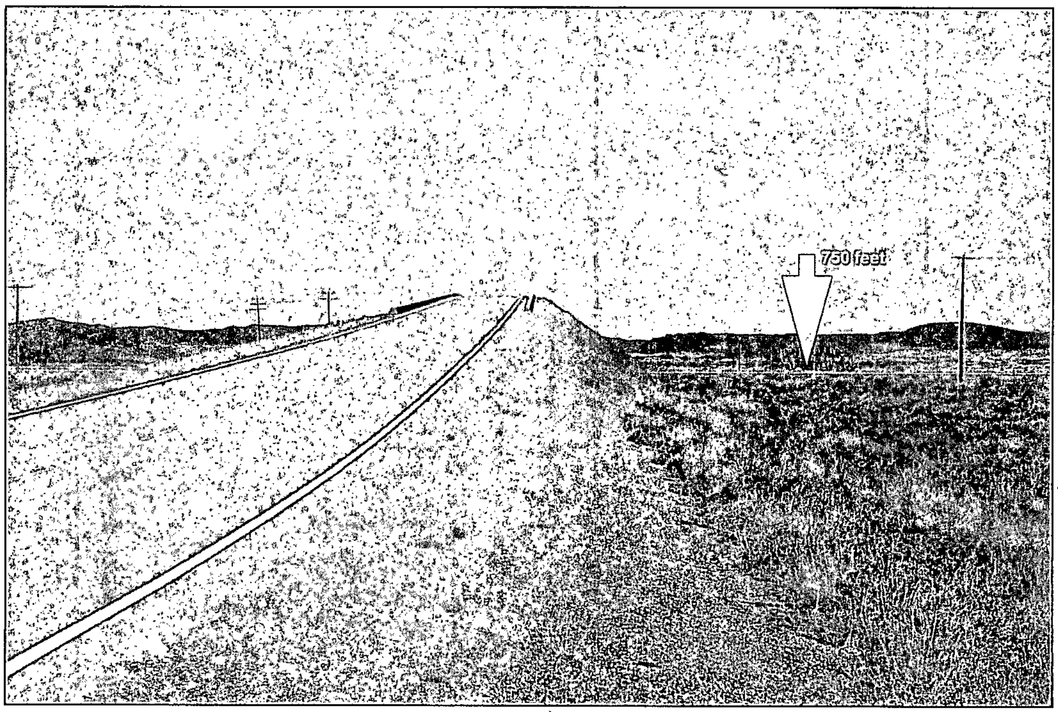


Figure D-13. Simulation of U.S. Highway 93 crossing over rail line in view north-northeast from key observation point 6.

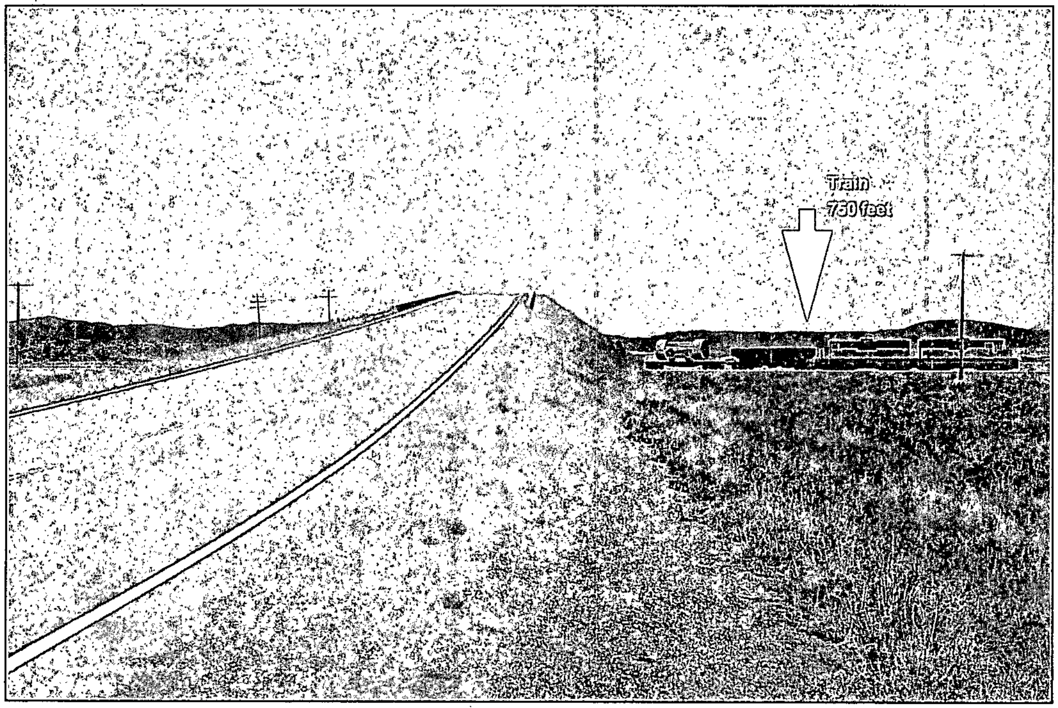


Figure D-14. Simulation of train on rail line at U.S. Highway 93 crossing over rail line in view north-northeast from key observation point 6.

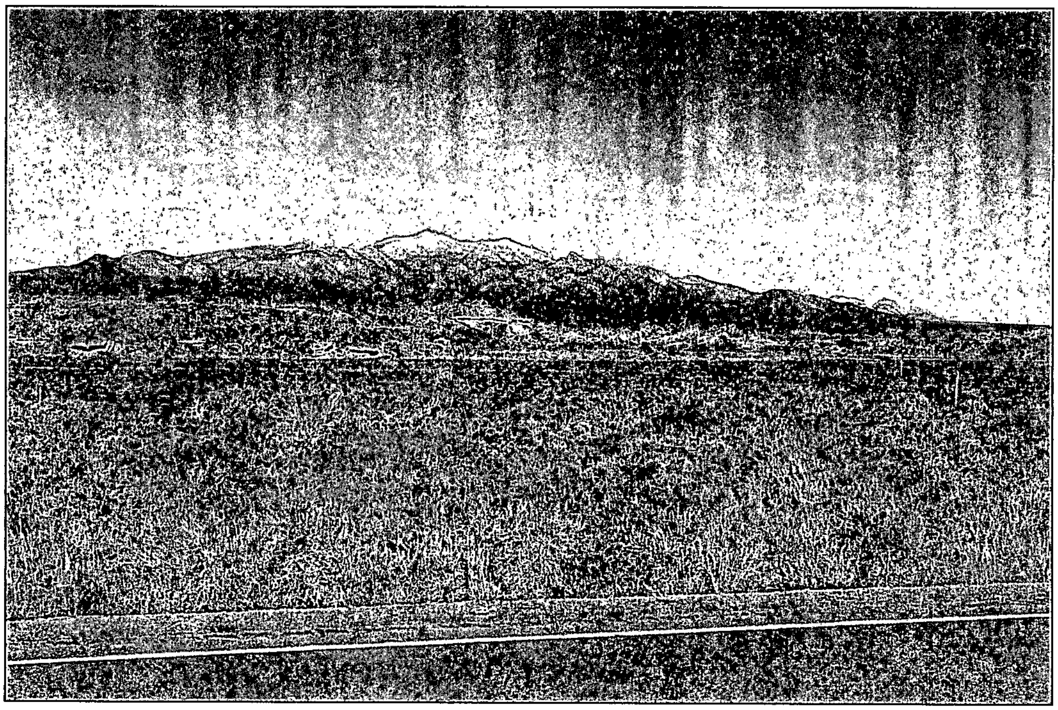


Figure D-15. View west from key observation point 7 on U.S. Highway 93 just north of rail line crossing, toward Highland Range and Bennett Pass.

Figure D-16. Simulation of track in view west from key observation point 7.

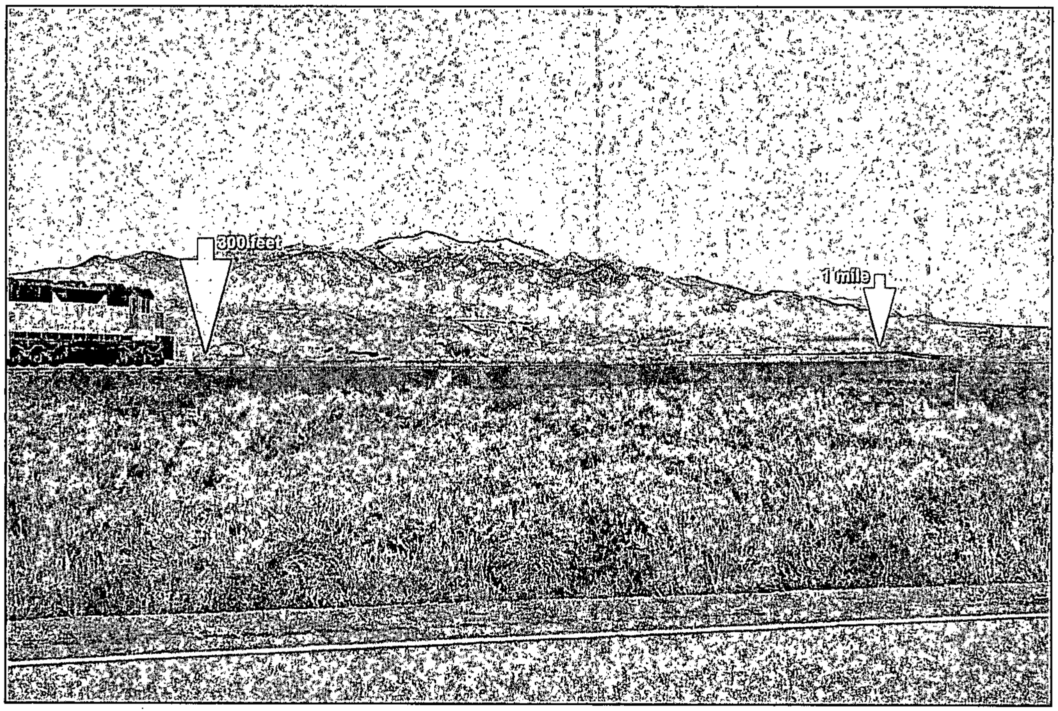


Figure D-17. Simulation of train close to U.S. Highway 93 in view west from key observation point 7.

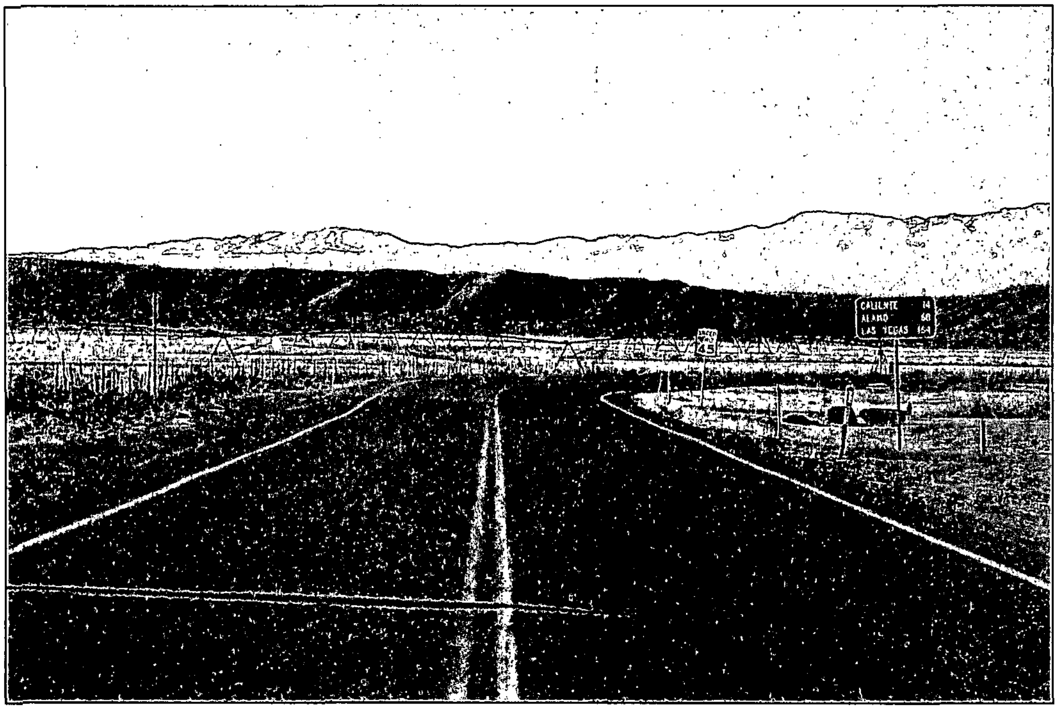


Figure D-18. View south from key observation point 8 along U.S. Highway 93 at intersection with State Route 319, toward Big Hogback. Rail line would not be visible in this view.

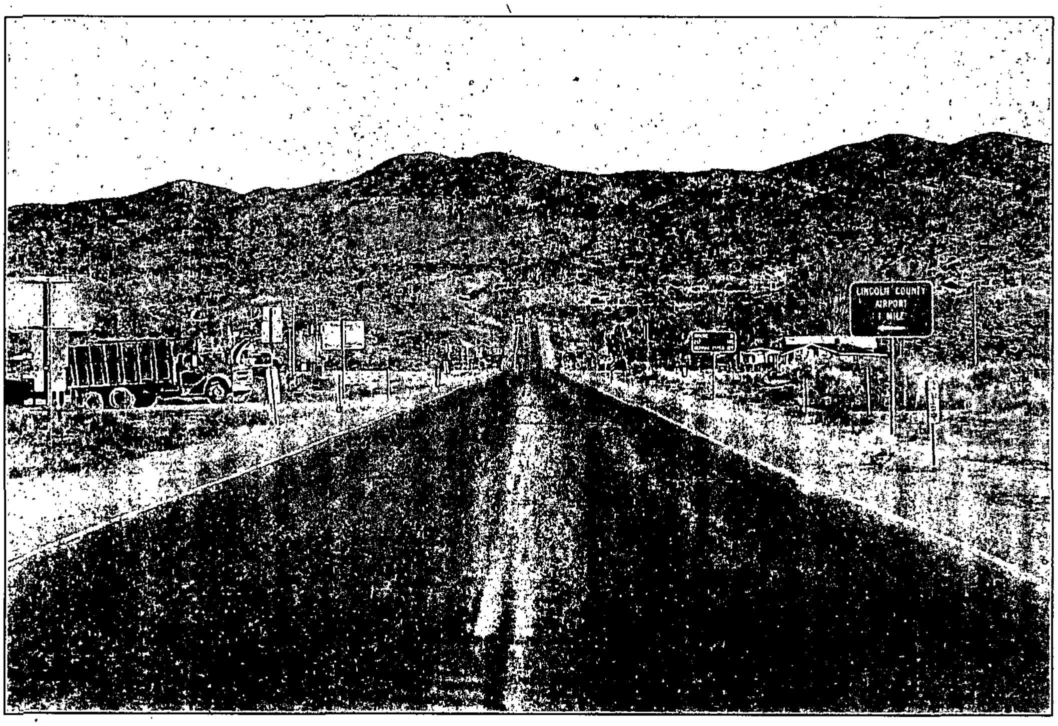


Figure D-19. View north from key observation point 8 along U.S. Highway 93 at intersection with State Route 319. Photograph taken to show that Cathedral Gorge is not visible from highway here.

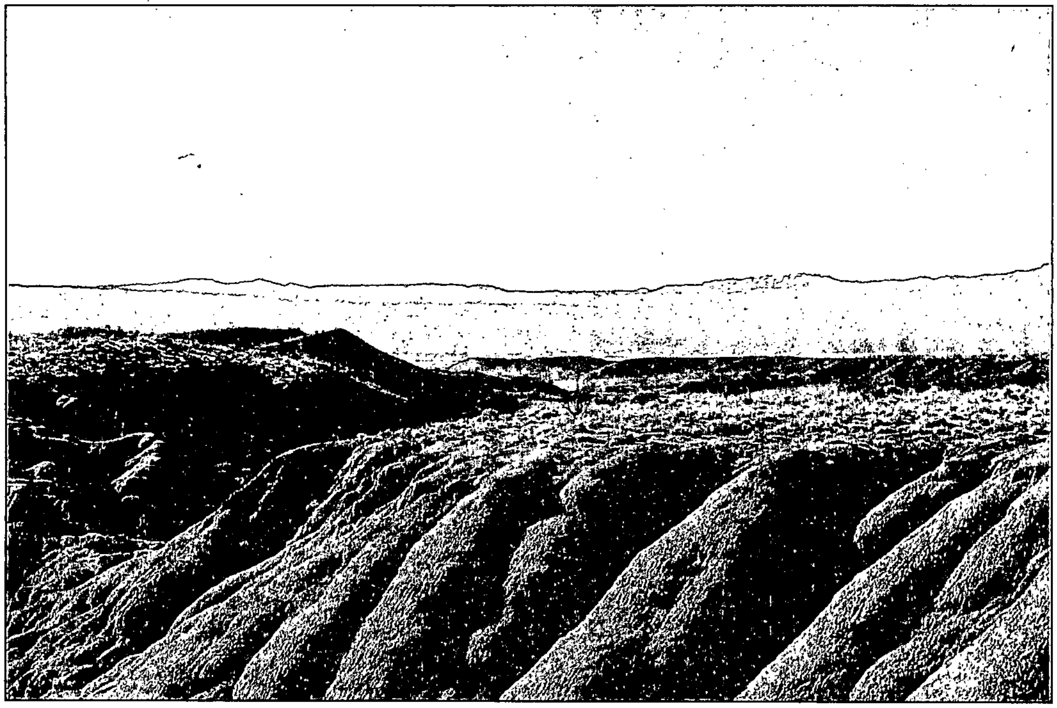


Figure D-20. View south from key observation point 9 at Miller Point in Cathedral Gorge Park toward rail alignment location. Rail line would be barely discernible, if visible at all.

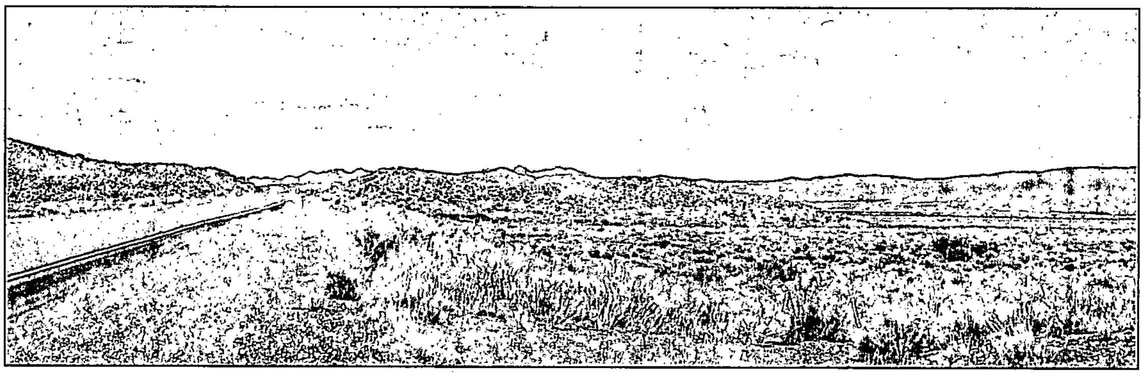


Figure D-21. Panorama from northwest to northeast from key observation point 10 on State Route 318, toward location of rail line crossing.

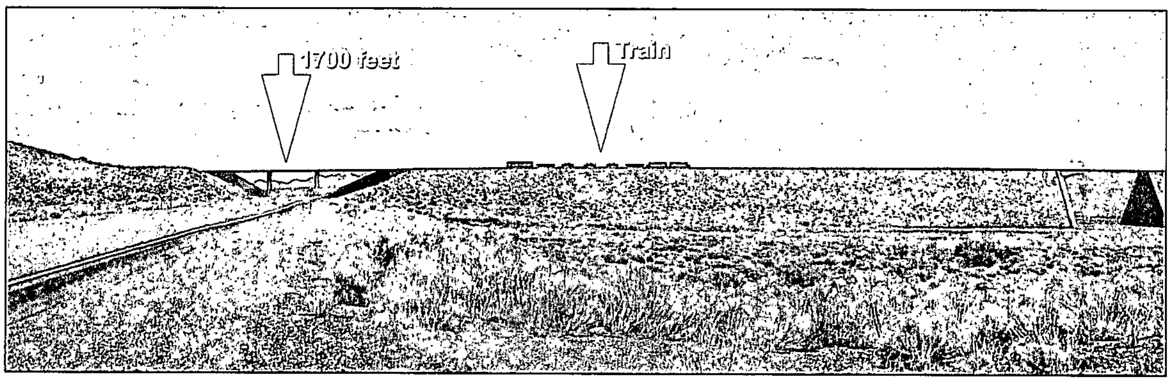


Figure D-22. Simulation of crossing structure and train on rail line in view northwest to northeast from key observation point 10.

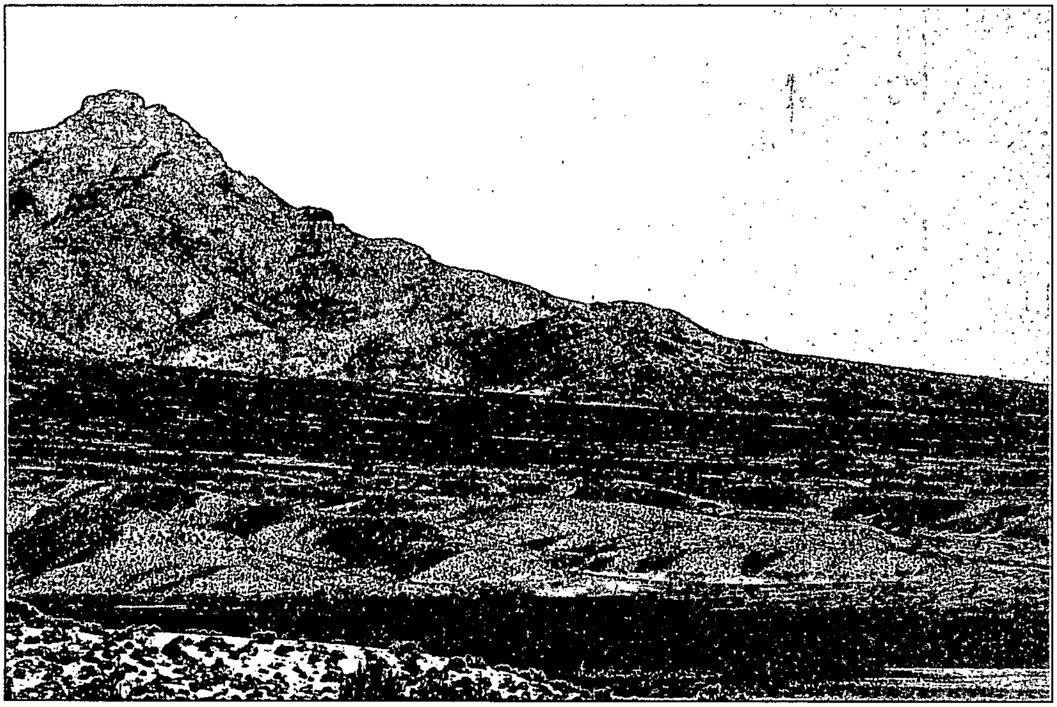


Figure D-23. View west toward Timber Mountain and northern Seaman Range from key observation point 11 off county road west of State Route 318 north of rail line crossing. White River visible in foreground.

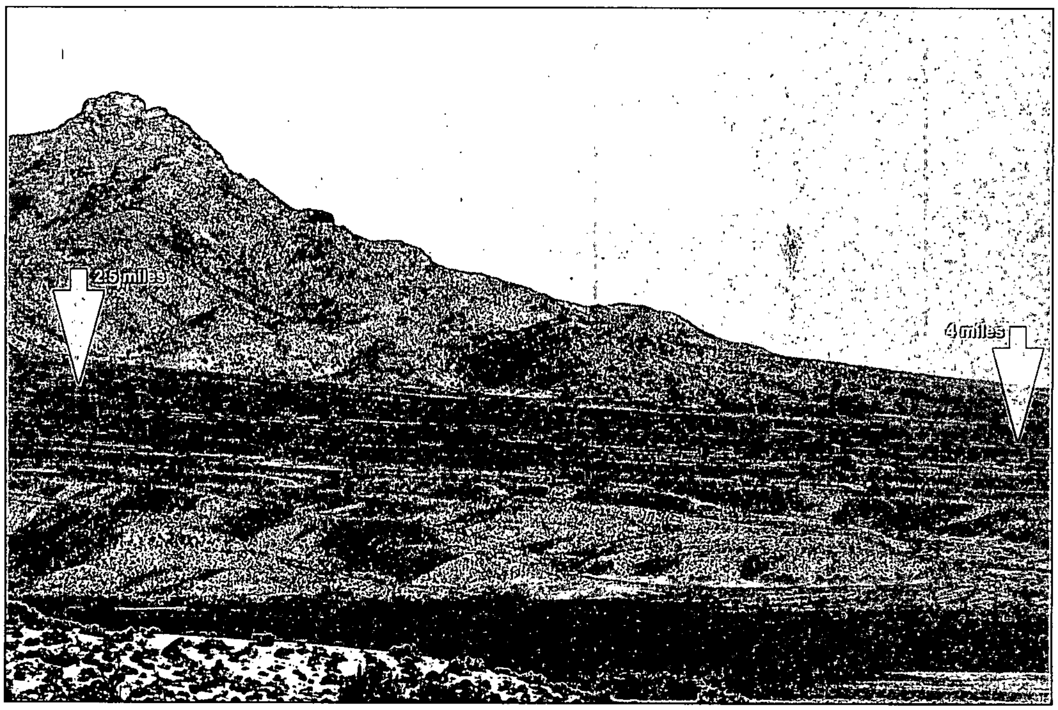


Figure D-24. Simulation of track in view west from key observation point 11.

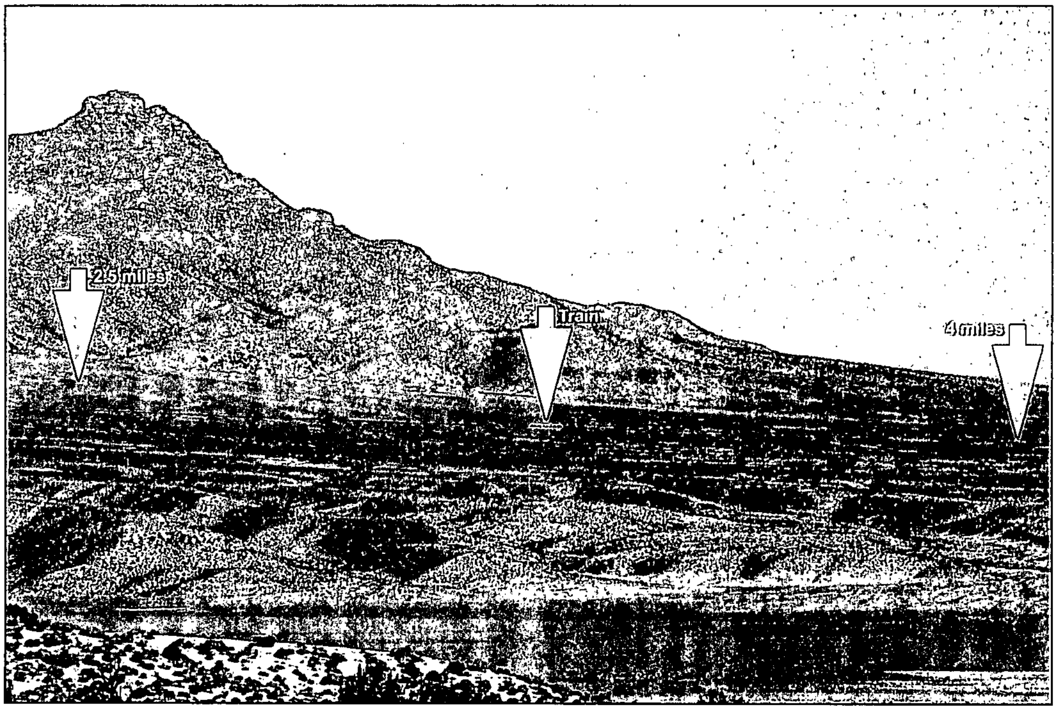


Figure D-25. Simulation of track and train in view west from key observation point 11.

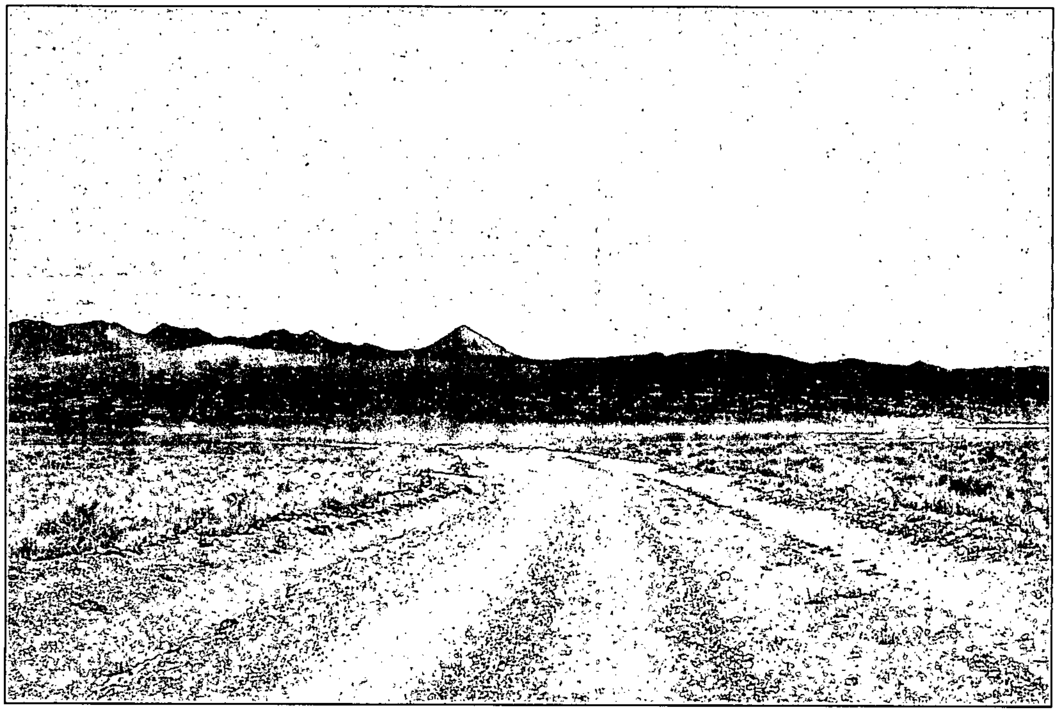


Figure D-26. View east-northeast from key observation point 12 on Timber Mountain Pass Road toward location of rail line crossing. White River visible in right midground.

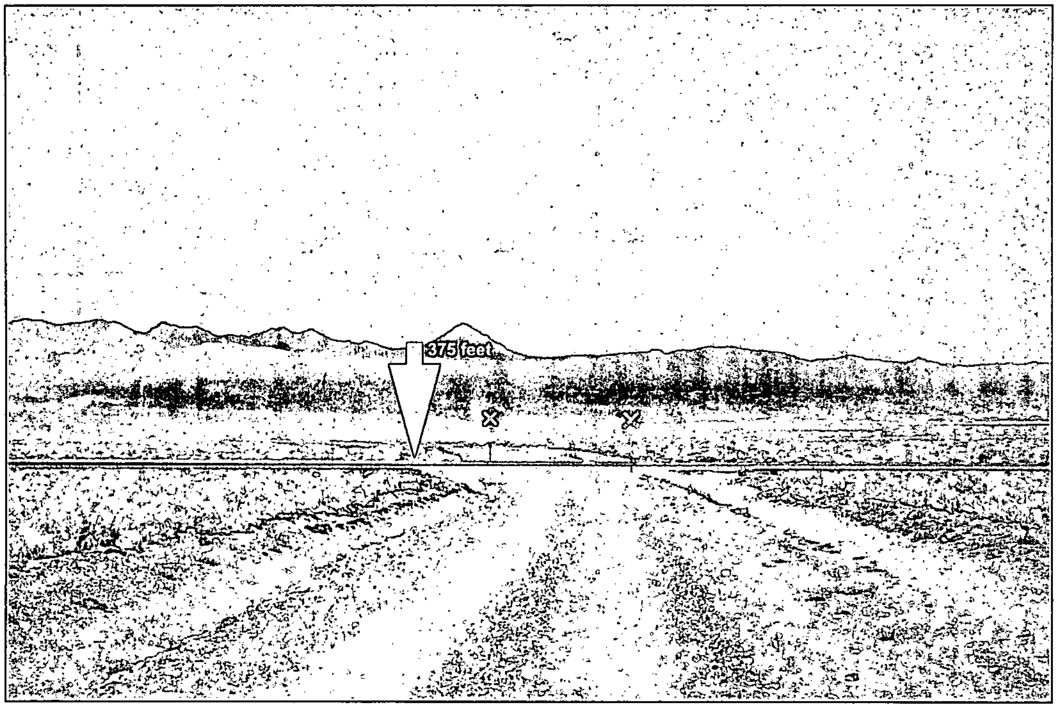


Figure D-27. Simulation of track and signals at rail line crossing of Timber Mountain Pass Road in view east-northeast from key observation point 12.

Figure D-28. Simulation of train at rail line crossing of Timber Mountain Pass Road in view east-northeast from key observation point 12.

Figure D-29. View northeast from key observation point 13 on a county road in south Garden Valley. Modifications associated with *City* sculpture visible as light band across midground, with trees on a ranch at right.

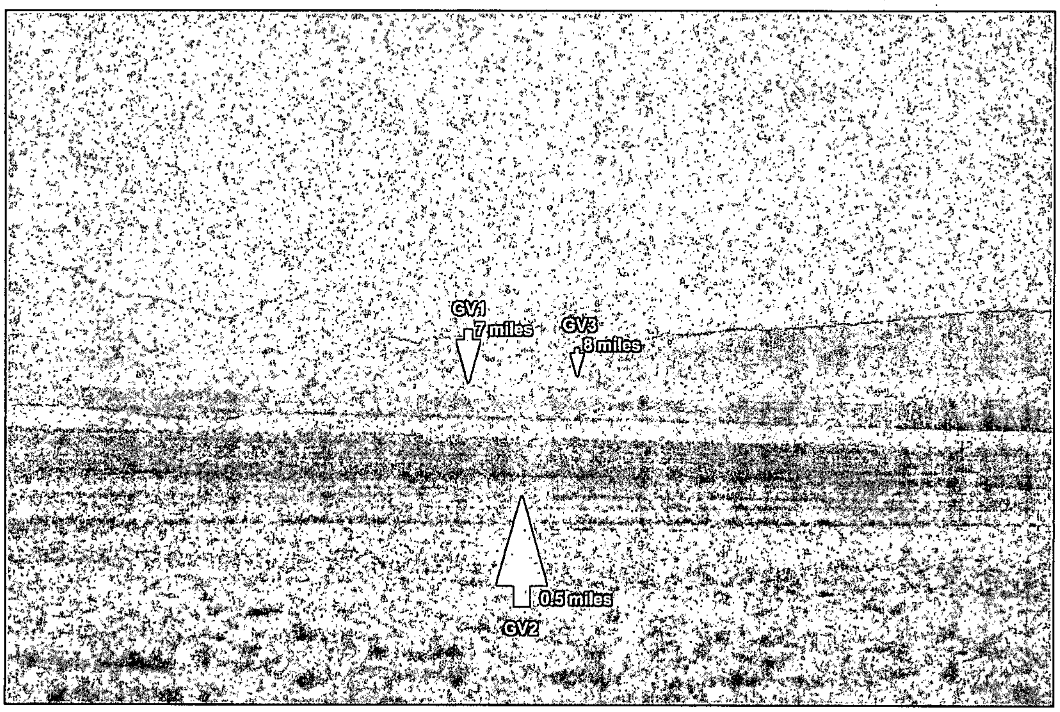


Figure D-30. Simulation from key observation point 13 of track on Garden Valley alternative segment 2 in foreground, Garden Valley alternative segments 1 and 3 in background, coming from east entry to valley. Note simulation of communications tower in right midground along Garden Valley alternative segment 2. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley alternative segment 2.

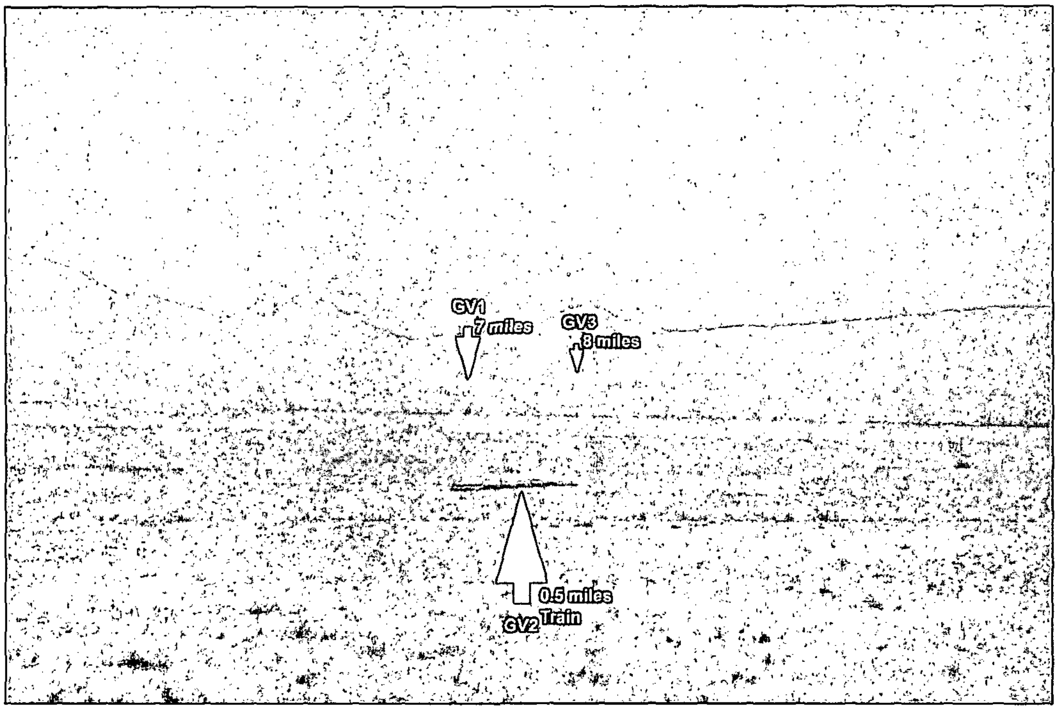


Figure D-31. Simulation of train on Garden Valley alternative segment 2 in view northeast from key observation point 13. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley alternative segment 2.

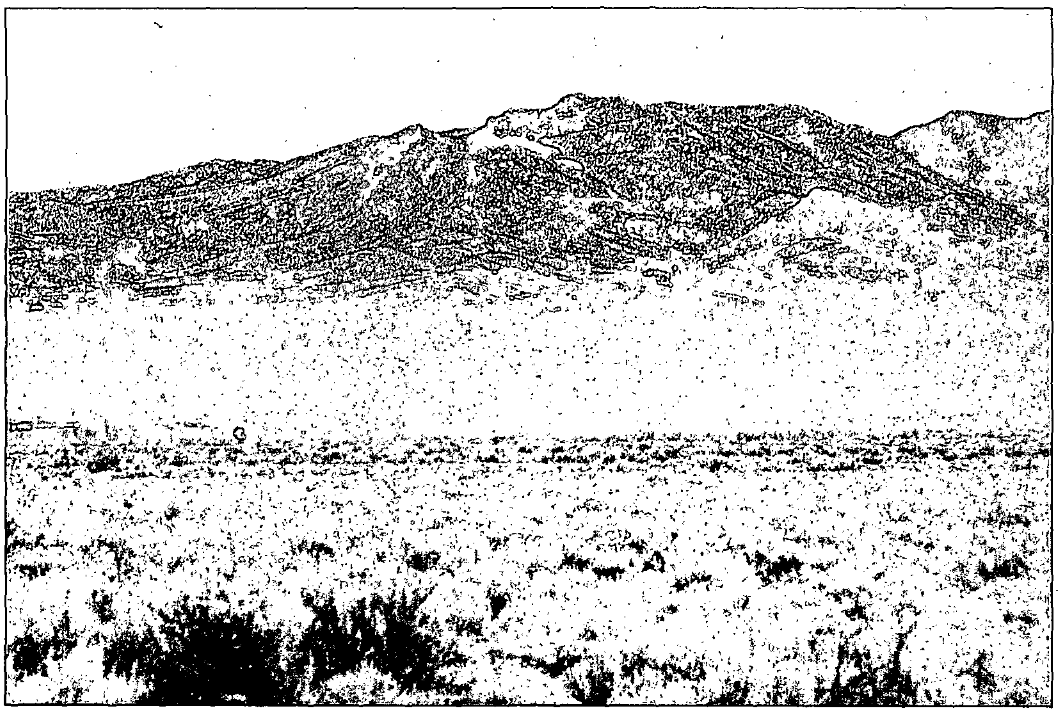


Figure D-32. View south from key observation point 14 on county road in middle of Garden Valley toward south end of the Golden Gate Range. Tops of some *City* sculpture mounds and ranch visible at left midground.

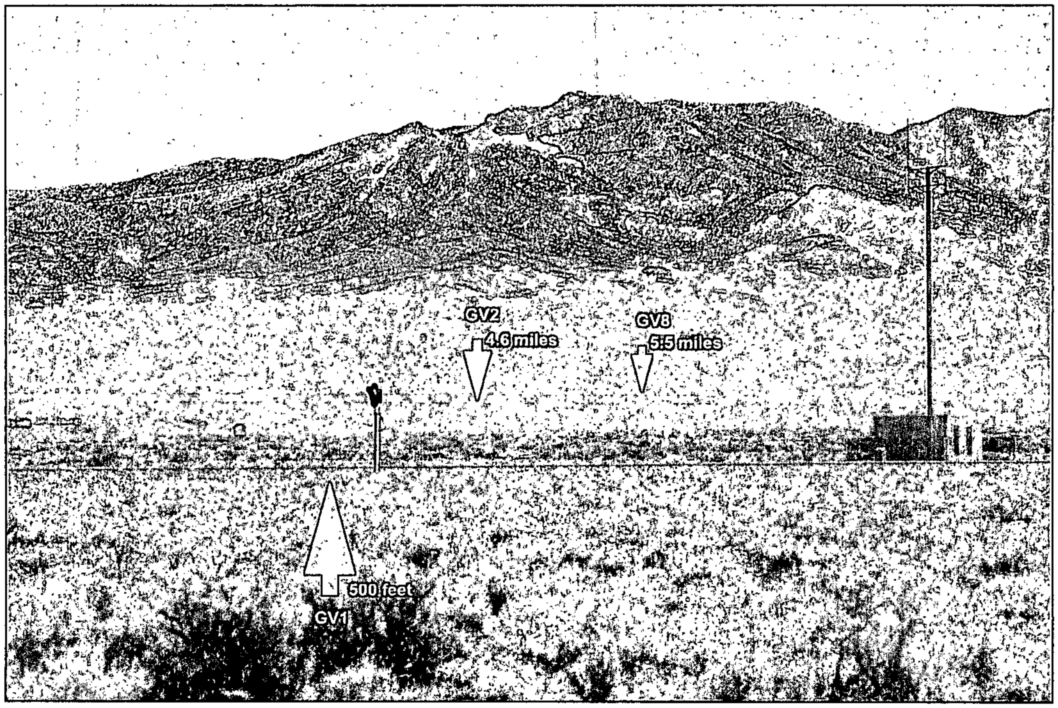


Figure D-33. Simulation from key observation point 14 of track on nearby Garden Valley alternative segment 1, distant Garden Valley alternative segment 2, and more distant Garden Valley alternative segment 8. Note simulation of signal and communication tower along Garden Valley alternative segment 1. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley 1.

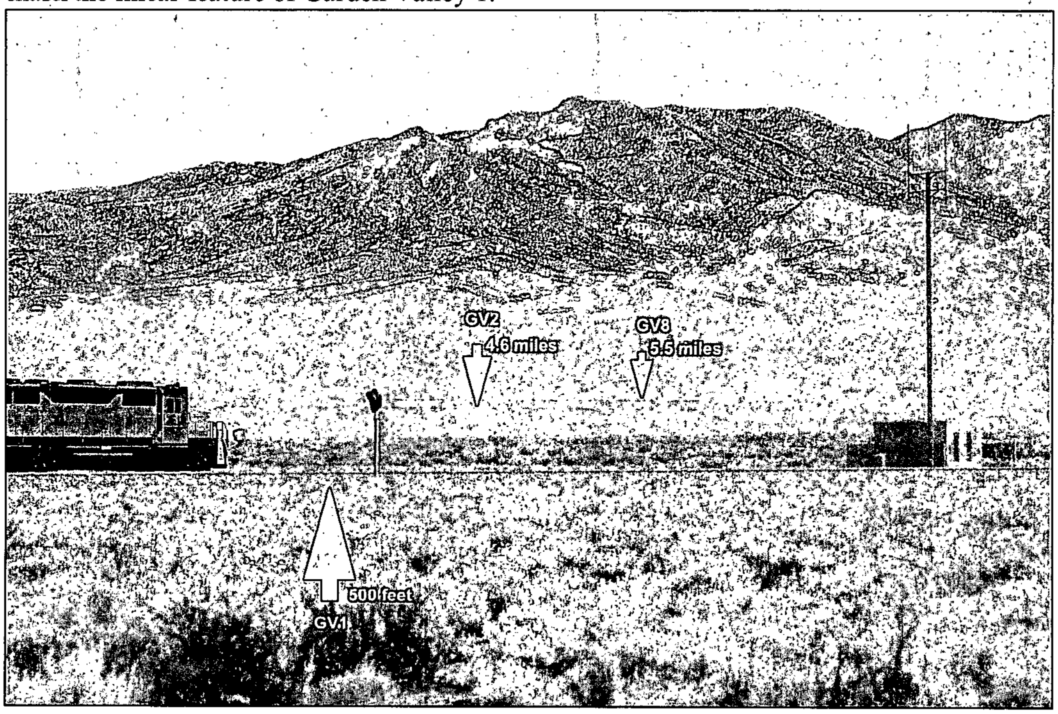


Figure D-34. Simulation of train on Garden Valley alternative segment 1 in view south from key observation point 14. Garden Valley alternative segment 2 and Garden Valley alternative segment 8 in distant midground. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley 1.

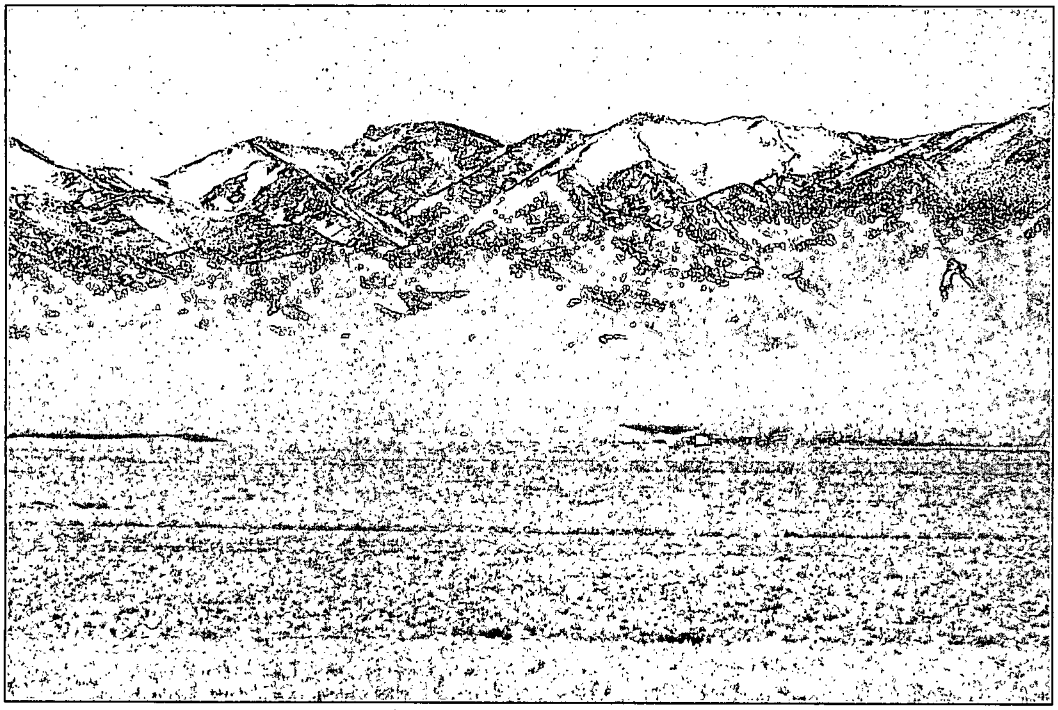


Figure D-35. View northwest toward Quinn Canyon Range from key observation point 15 on county road south of Garden Valley. Tops of some *City* sculpture mounds visible in midground, ranch in right midground.

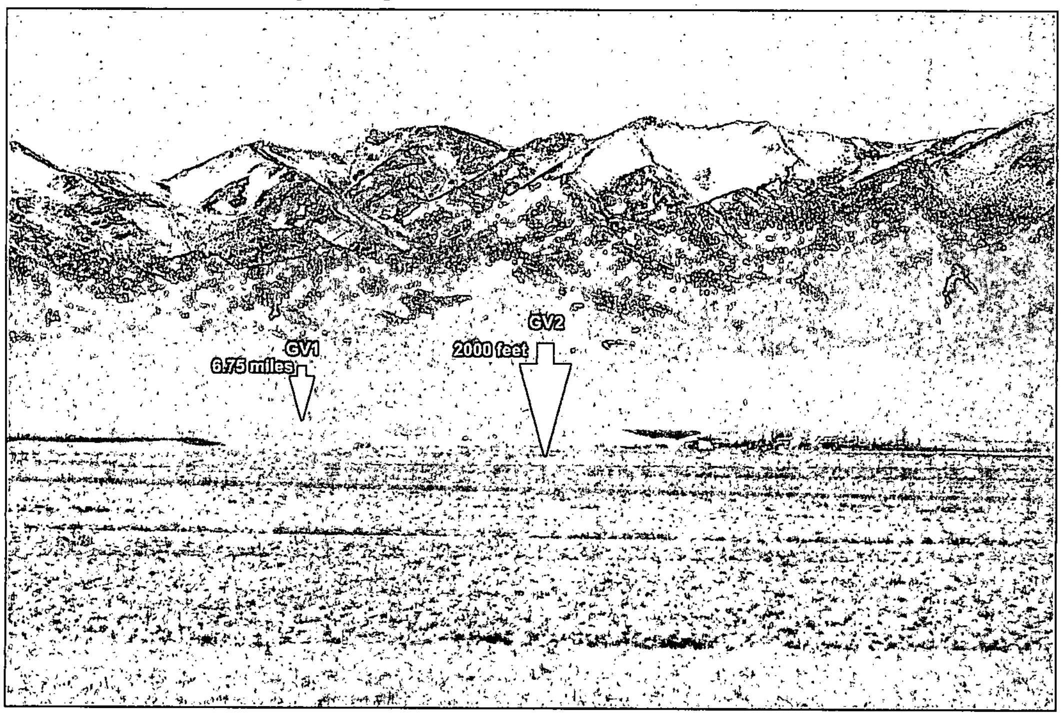


Figure D-36. Simulation of track on Garden Valley alternative segment 1 (background) and Garden Valley alternative segment 2 in view northwest from key observation point 15. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley 2.

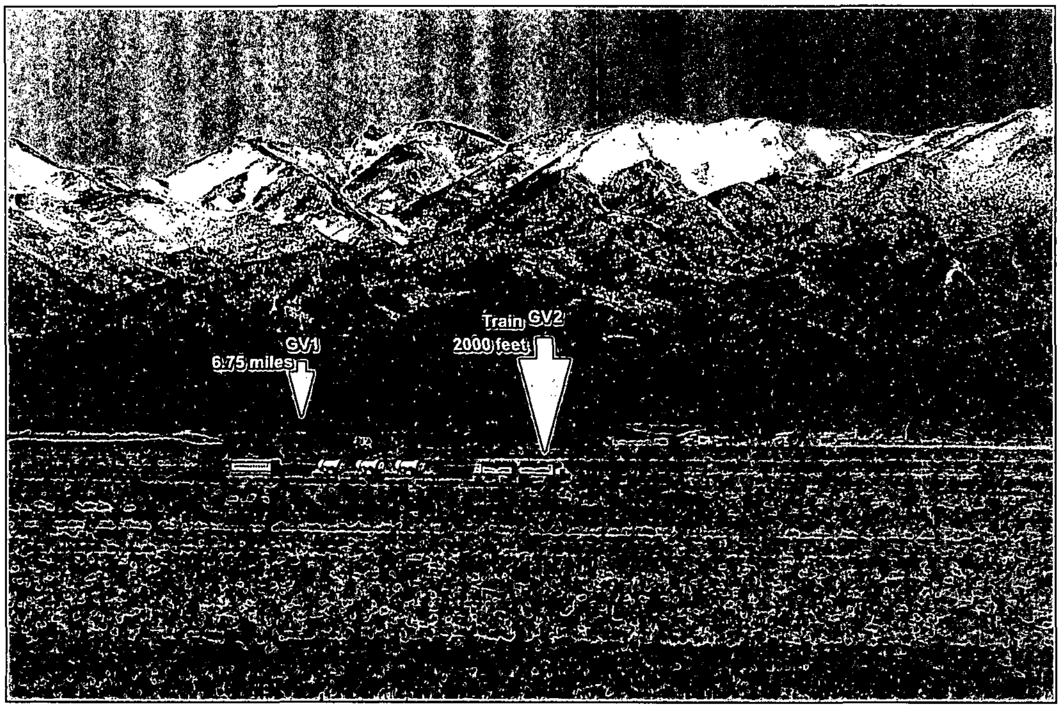


Figure D-37. Simulation of trains on Garden Valley alternative segment 2 (closest to viewer) and Garden Valley alternative segment 1 in view northwest from key observation point 15. Not in picture is an earthwork berm that would mask the linear feature of Garden Valley 2.

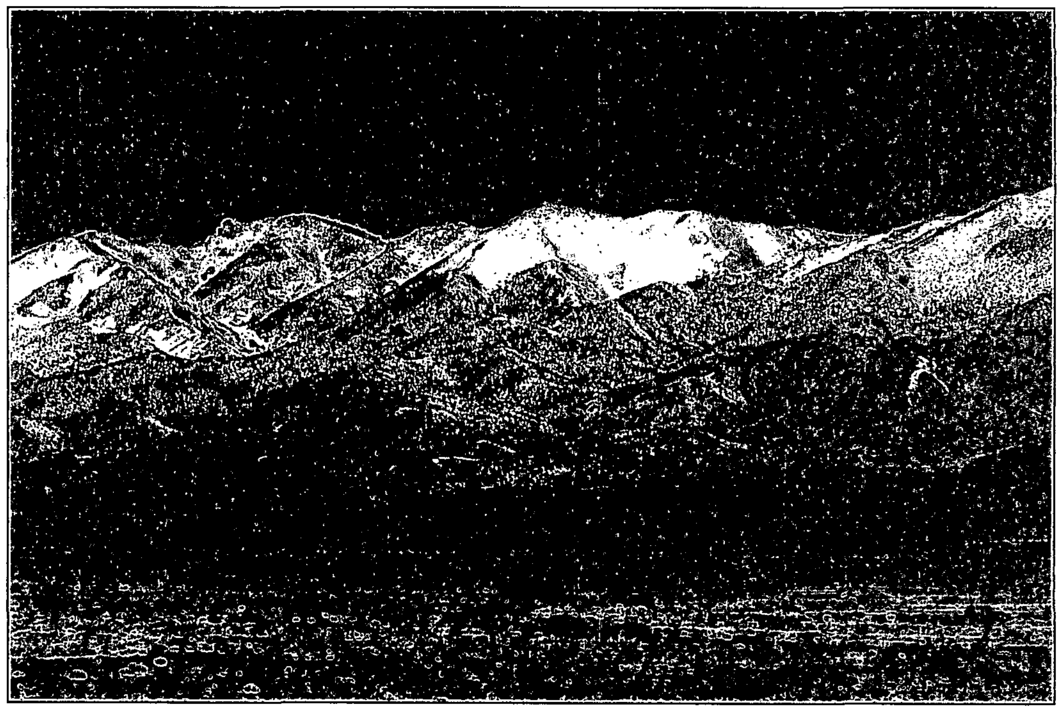


Figure D-38. View northwest toward the Quinn Canyon Range from key observation point 16 on top of a *City* mound.

Figure D-39. Simulation of track on Garden Valley alternative segment 1 (midground) and Garden Valley alternative segment 3 (background) in view northwest from key observation point 16.

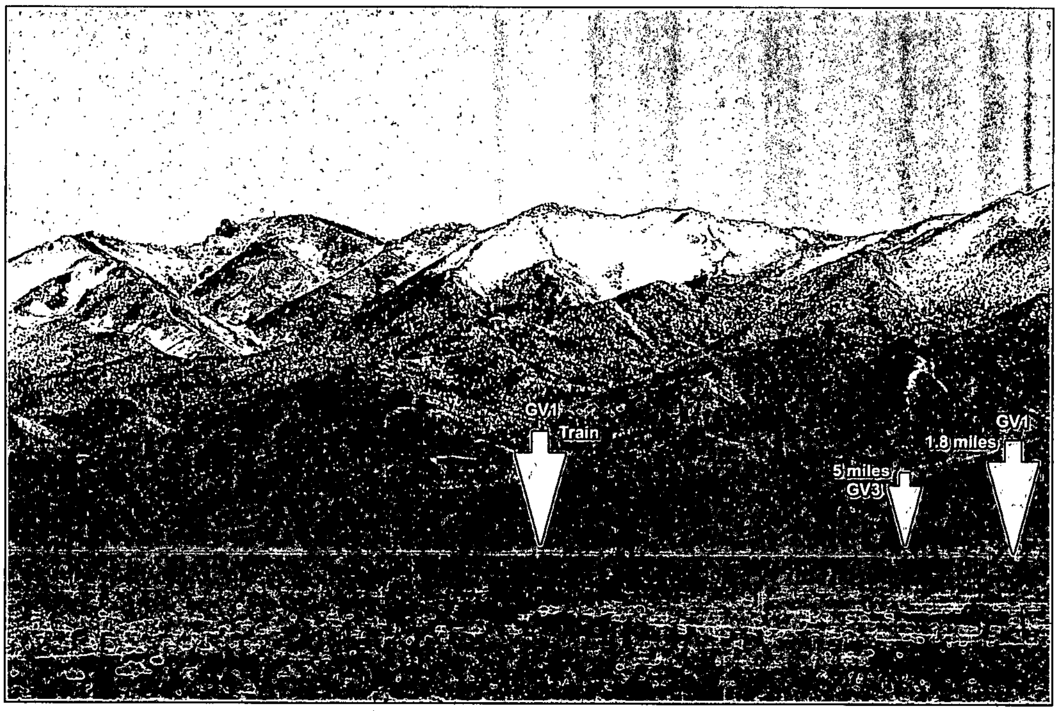


Figure D-40. Simulation of trains on Garden Valley alternative segment 1 and Garden Valley alternative segment 3 in view northwest from key observation point 16.

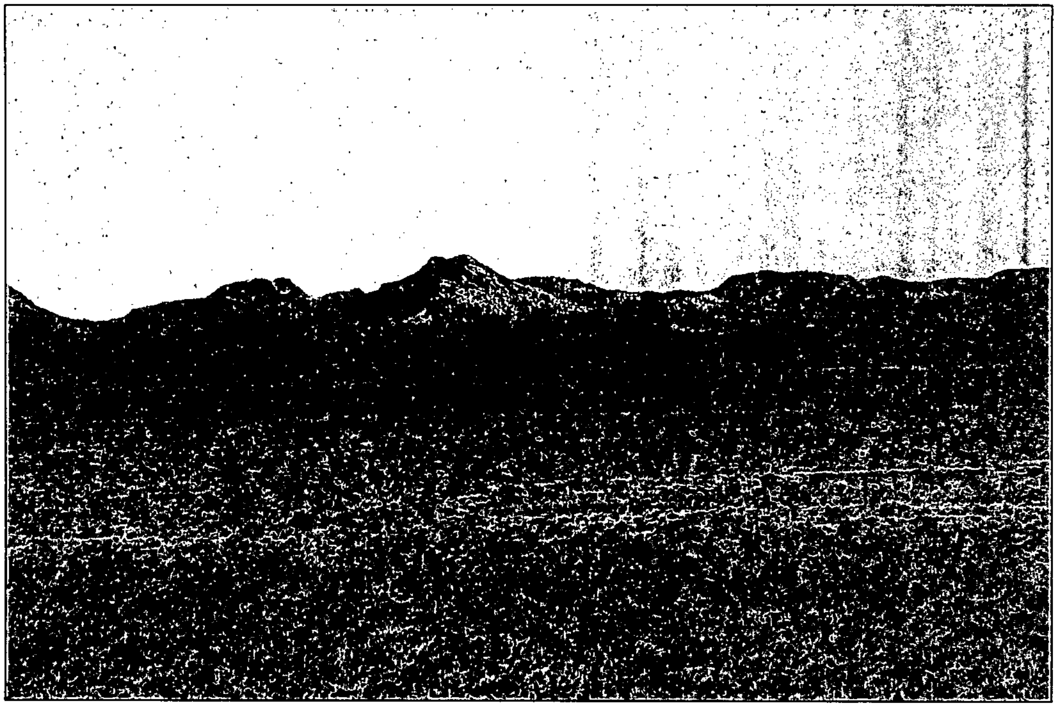


Figure D-41. View west-southwest from key observation point 16 on top of a *City* mound over Garden Valley between the Worthington and Quinn Canyon Ranges.

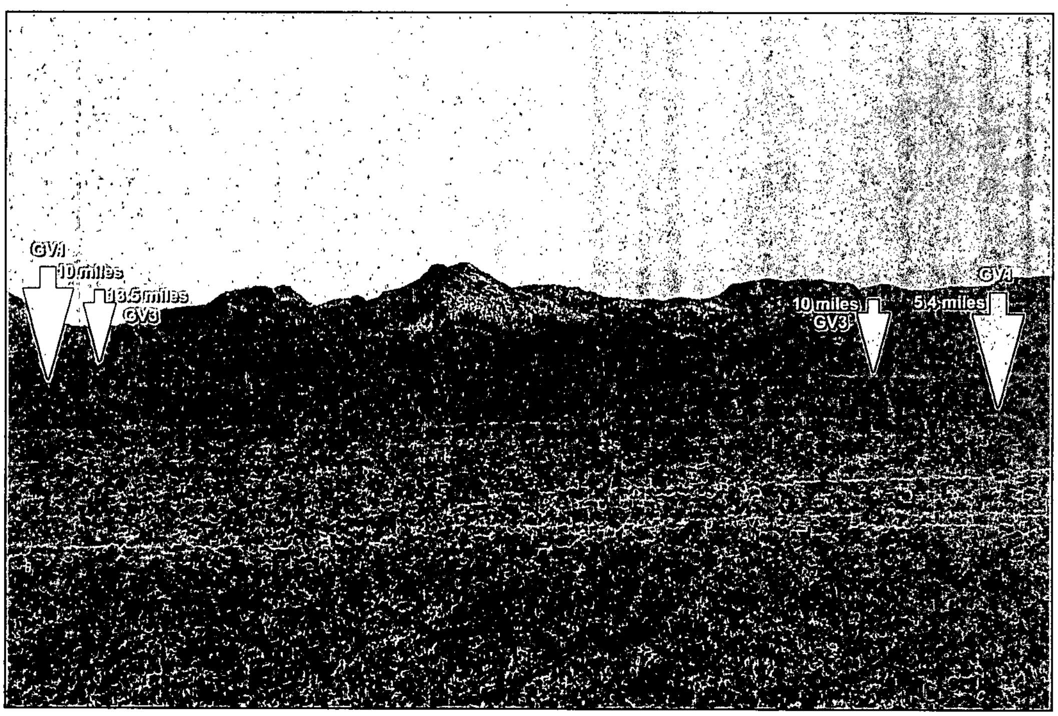


Figure D-42. Simulation of track on Garden Valley alternative segment 1 across midground of view, Garden Valley alternative segment 3 more distant, in view west-southwest from key observation point 16. Construction camp would be at greater distance from viewer, off photo on left.

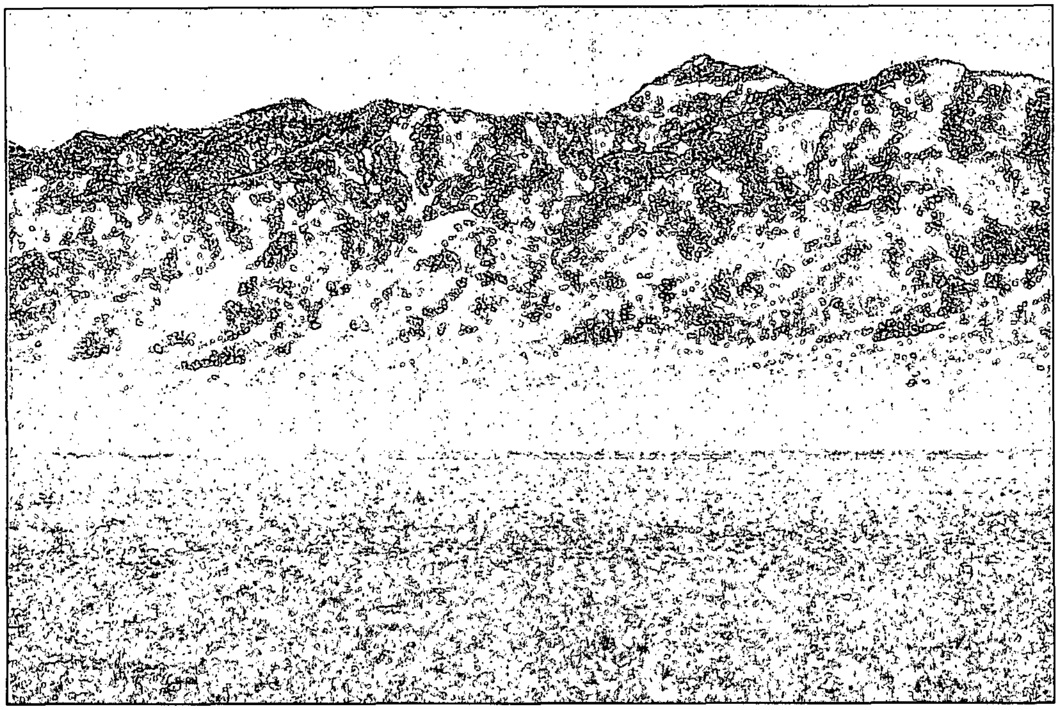


Figure D-43. View southwest toward the Worthington Range from key observation point 17 on top of a *City* mound.

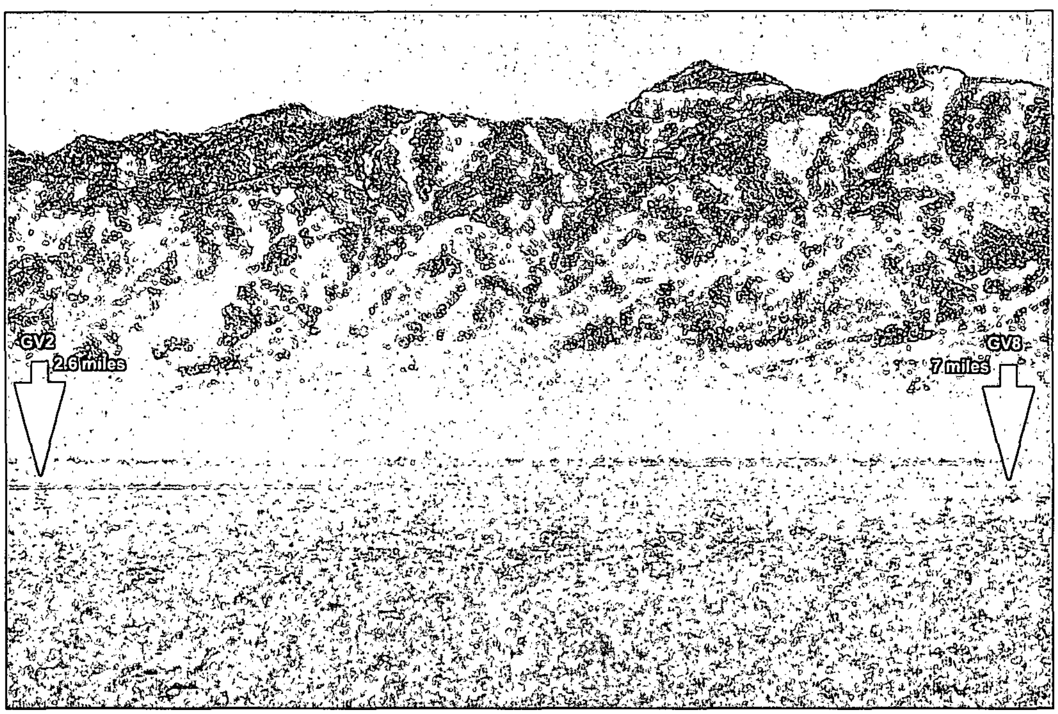


Figure D-44. Simulation of track on Garden Valley alternative segments 2 and 8 in view southwest from key observation point 17. On west side Garden Valley alternative segments 2 and 8 are approximately 1 mile apart; the two simulated tracks are not visible as distinct lines because of the distance and local topography. Instead, the visible line is slightly thicker than it would be if only one alternative segment were shown. The alternative segments merge into a single segment at about the center of the picture.

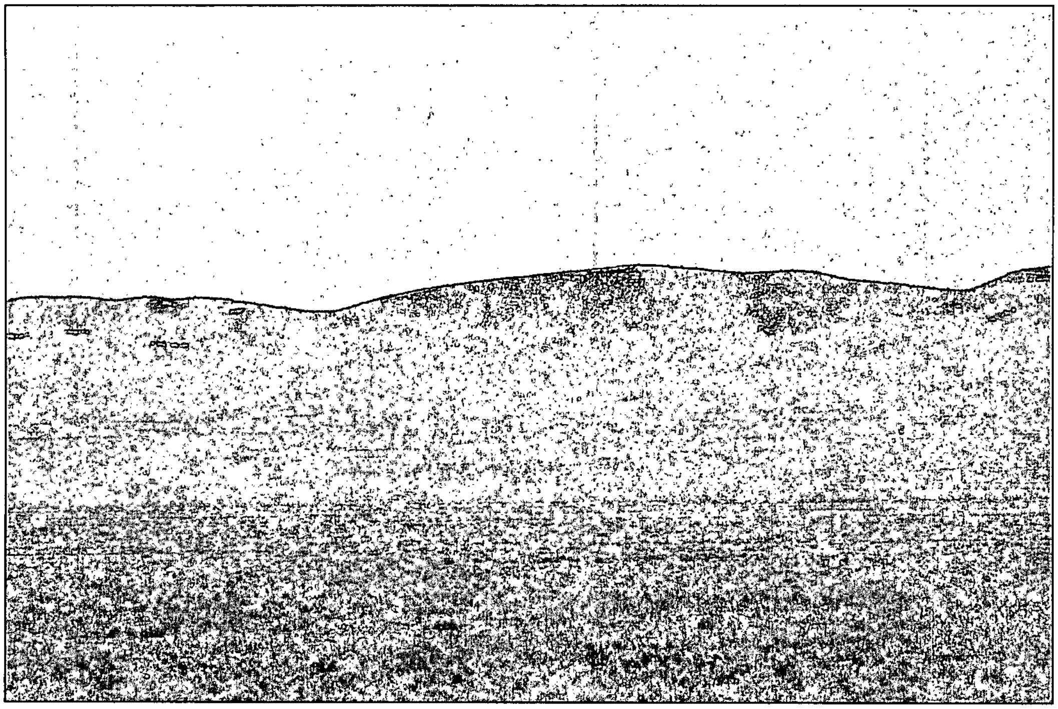


Figure D-45. View southeast from key observation point 18 on top of a *City* mound toward the Golden Gate Range.

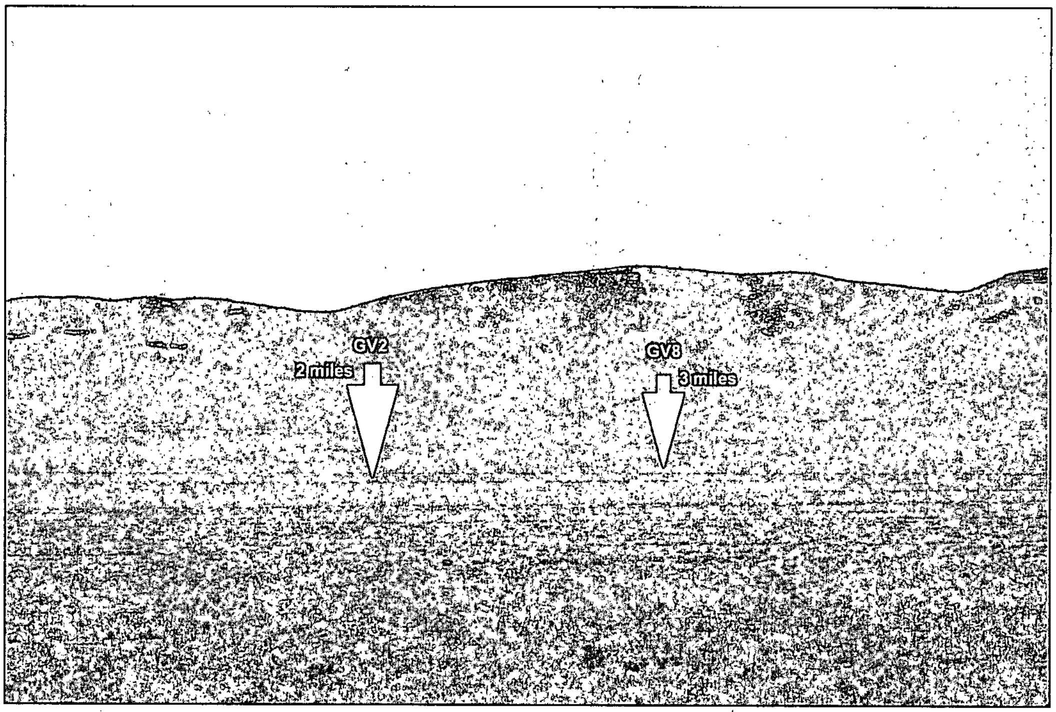


Figure D-46. Simulation of track on Garden Valley alternative segment 2 and Garden Valley alternative segment 8 (more distant) in view southeast from key observation point 18.

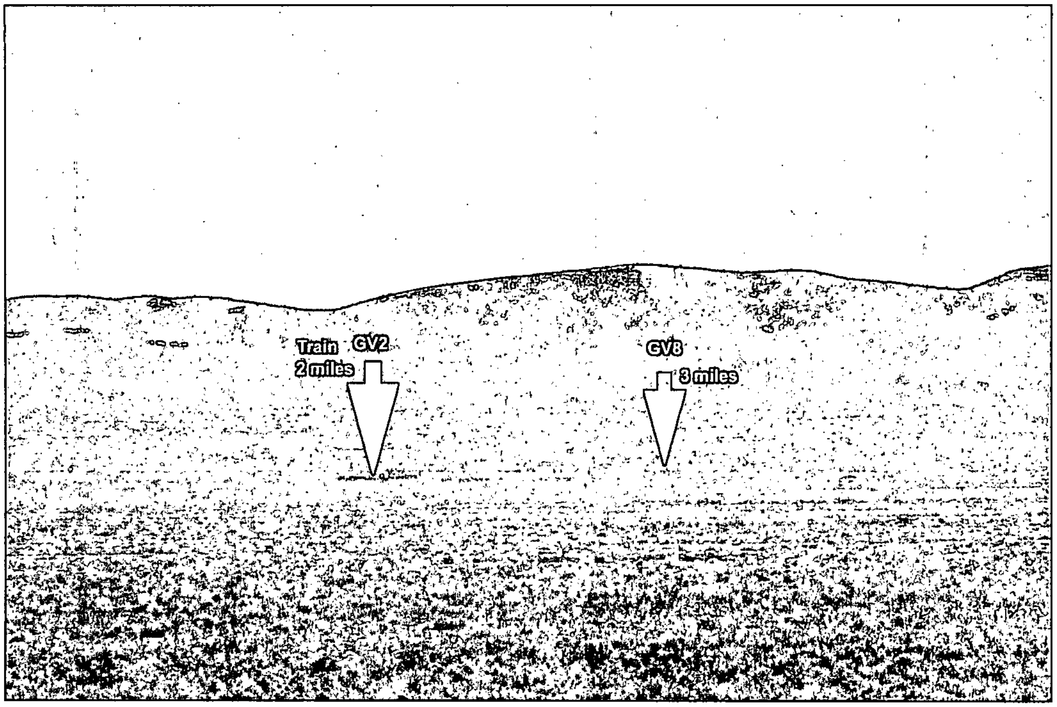


Figure D-47. Simulation of train on Garden Valley alternative segment 2 and track on Garden Valley alternative segment 8 (more distant), in view southeast from key observation point 18.

Figure D-48. View slightly north of east from key observation point 18 on top of a *City* mound, toward Water Gap. Note distant scar of Timber Mountain Pass Road over the Seaman Range in left midground.

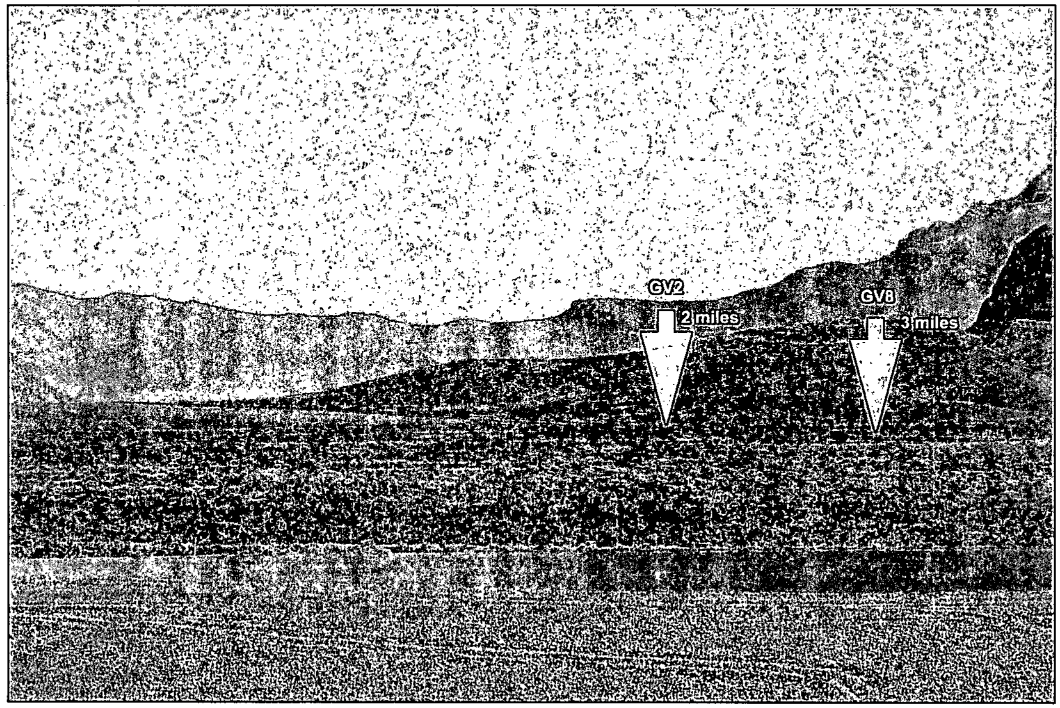


Figure D-49. Simulation of track on Garden Valley alternative segment 2 and Garden Valley alternative segment 8 (more distant) in view slightly north of east from key observation point 18.

Figure D-50. Simulation of train on Garden Valley alternative segment 2 and track on Garden Valley alternative segment 8 (more distant), in view slightly north of east from key observation point 18.

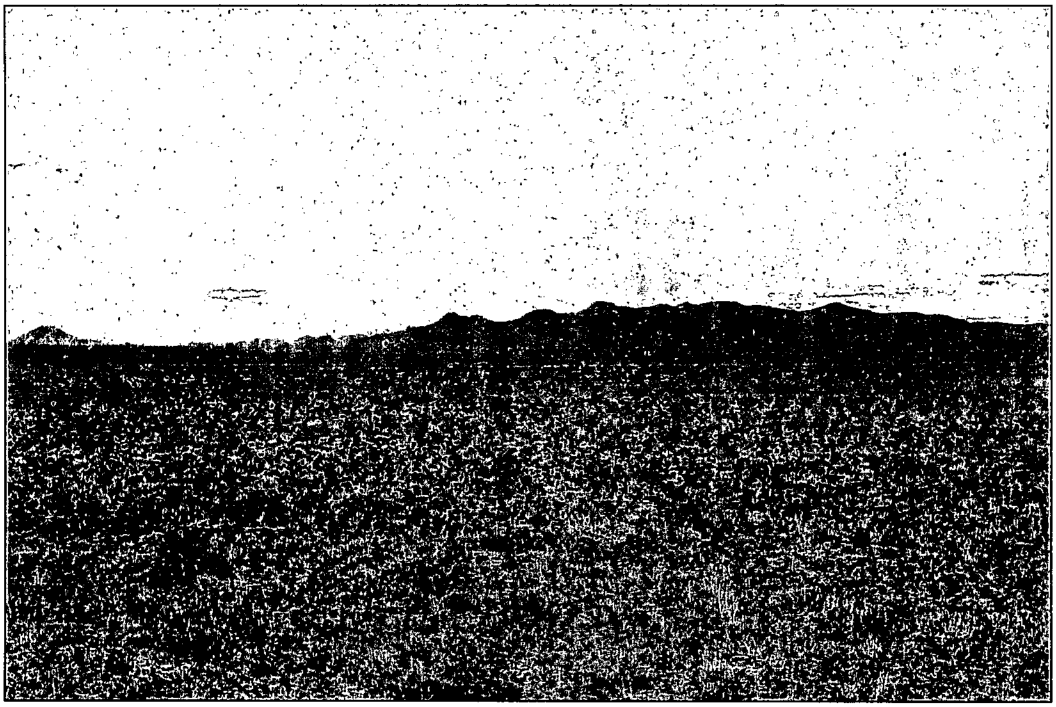


Figure D-51. View south-southwest from key observation point 19 on State Route 375 near rail line crossing.

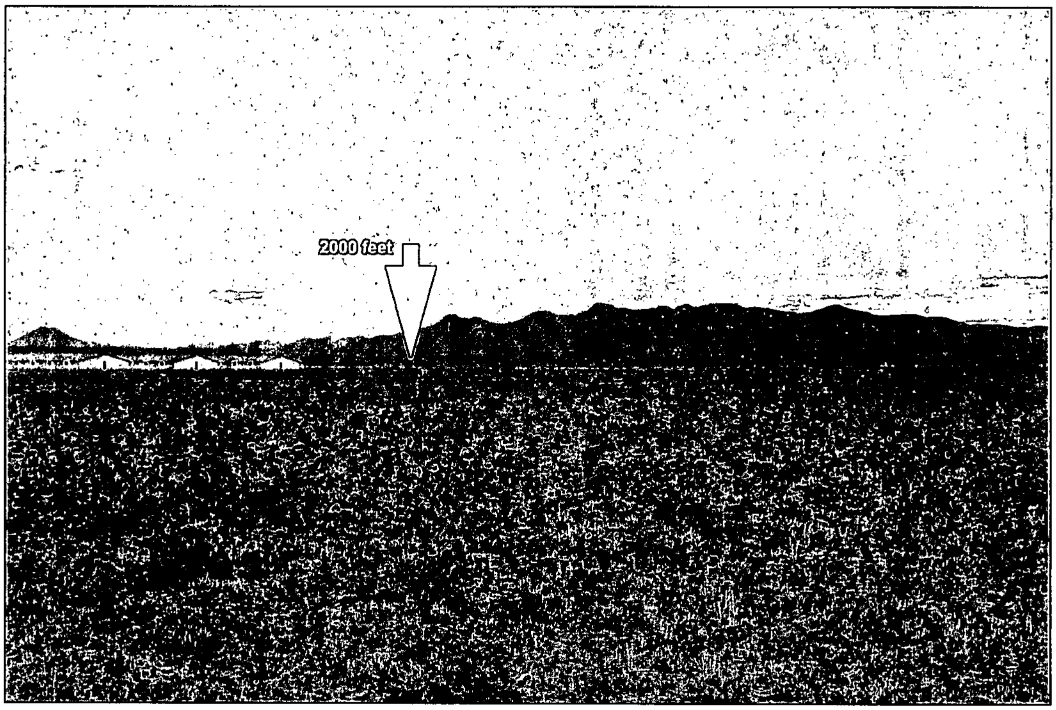


Figure D-52. Simulation of track and construction camp in view south-southwest from key observation point 19.

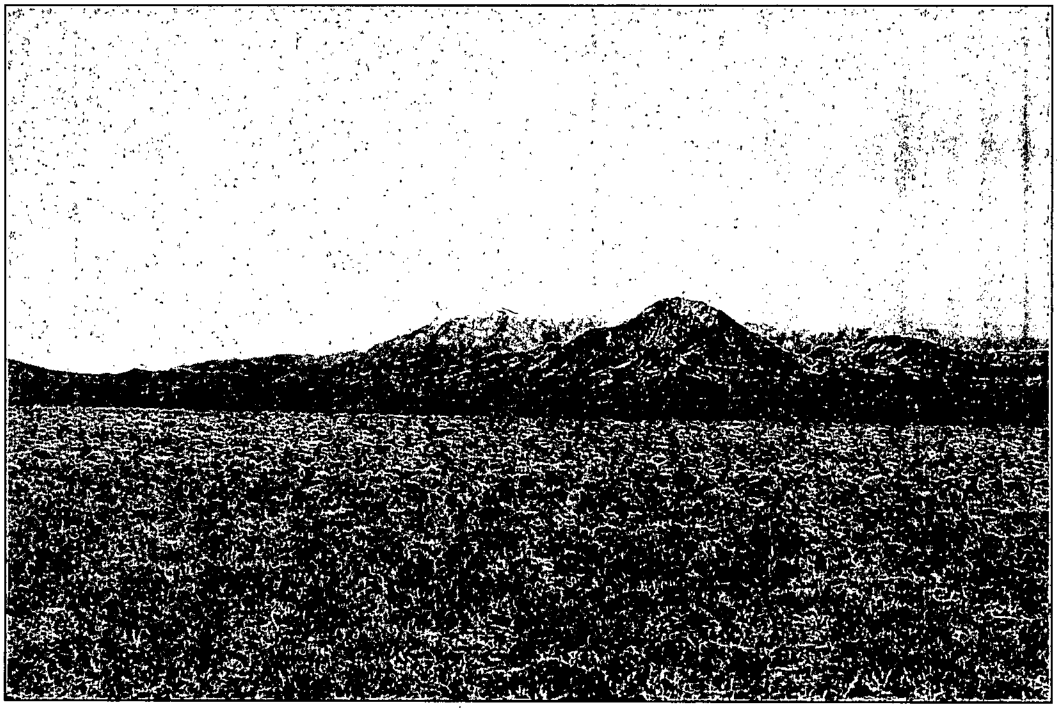


Figure D-53. View northeast from key observation point 20 at Cedar Pipeline Ranch. Quinn Canyon Range in center and right background; cone in center midground is Black Top.

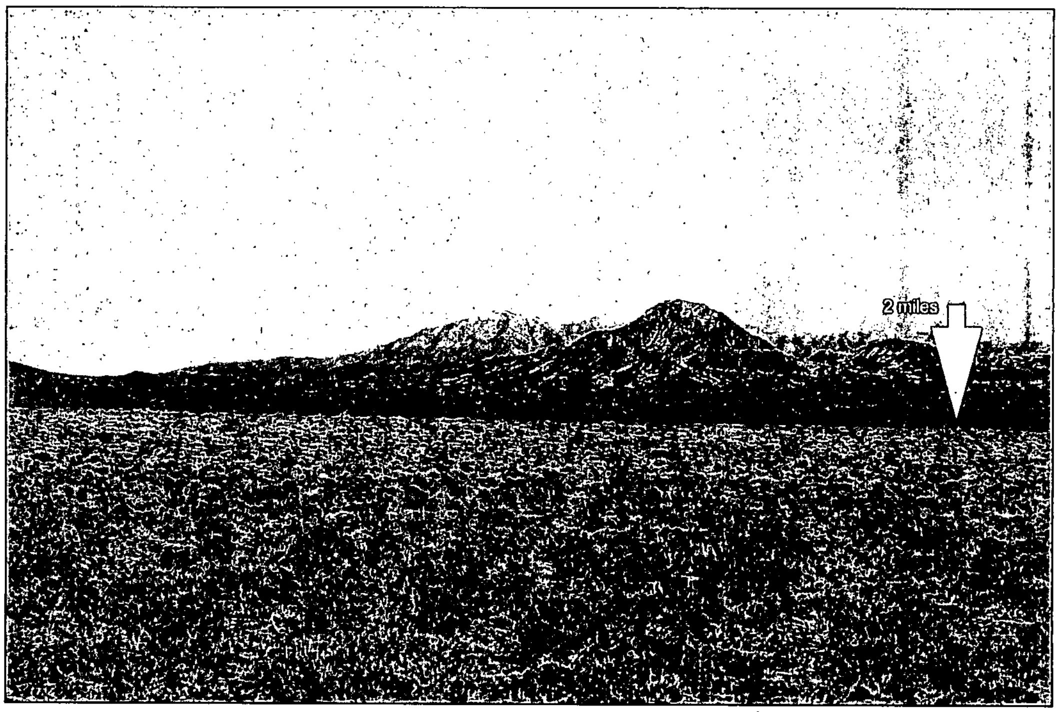


Figure D-54. Simulation of track in view northeast from key observation point 20.

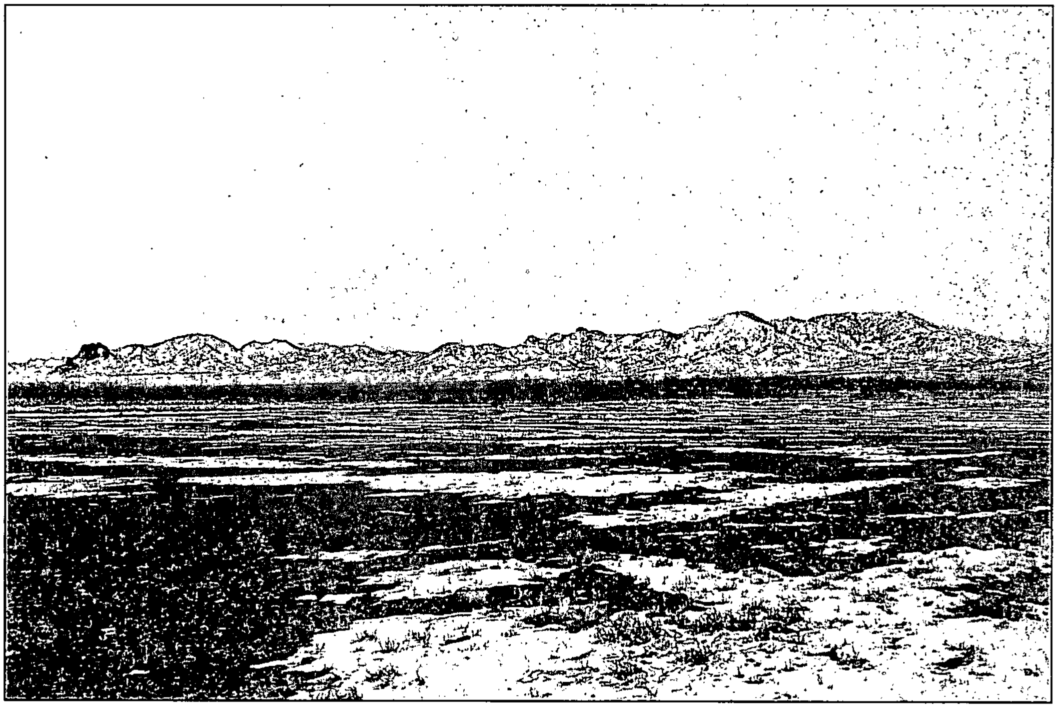


Figure D-55. View south from key observation point 21 on State Route 375 near intersection with U.S. Highway 6. View shows Reveille Valley with Kawich Range in middle ground. Rail line would be too distant to be seen in this view.

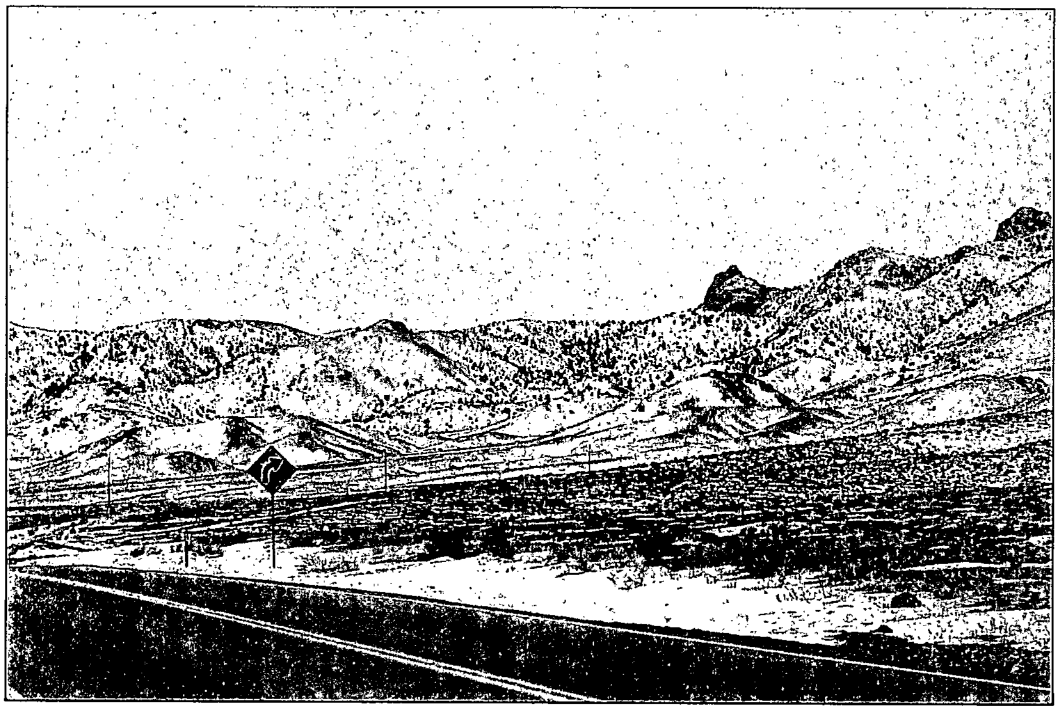


Figure D-56. View southwest from key observation point 22 on U.S. Highway 6 near intersection with State Route 375 toward the Kawich Range.

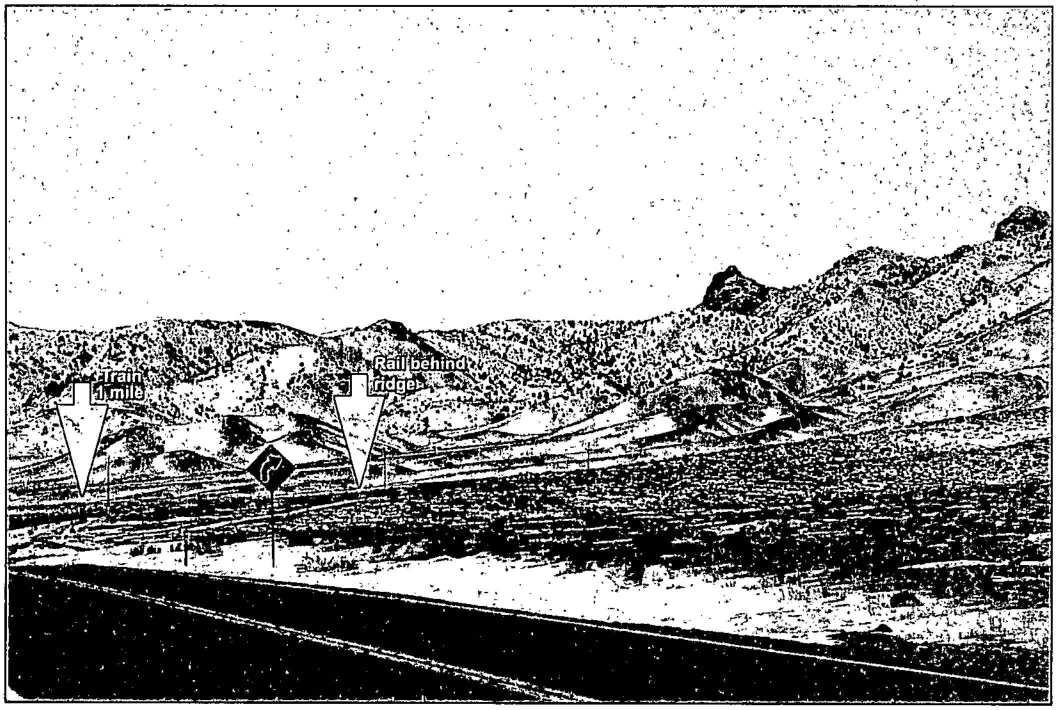


Figure D-57. Simulation of train in view from key observation point 22. As noted on photograph, much of the rail line would be obscured by topography from this viewpoint.

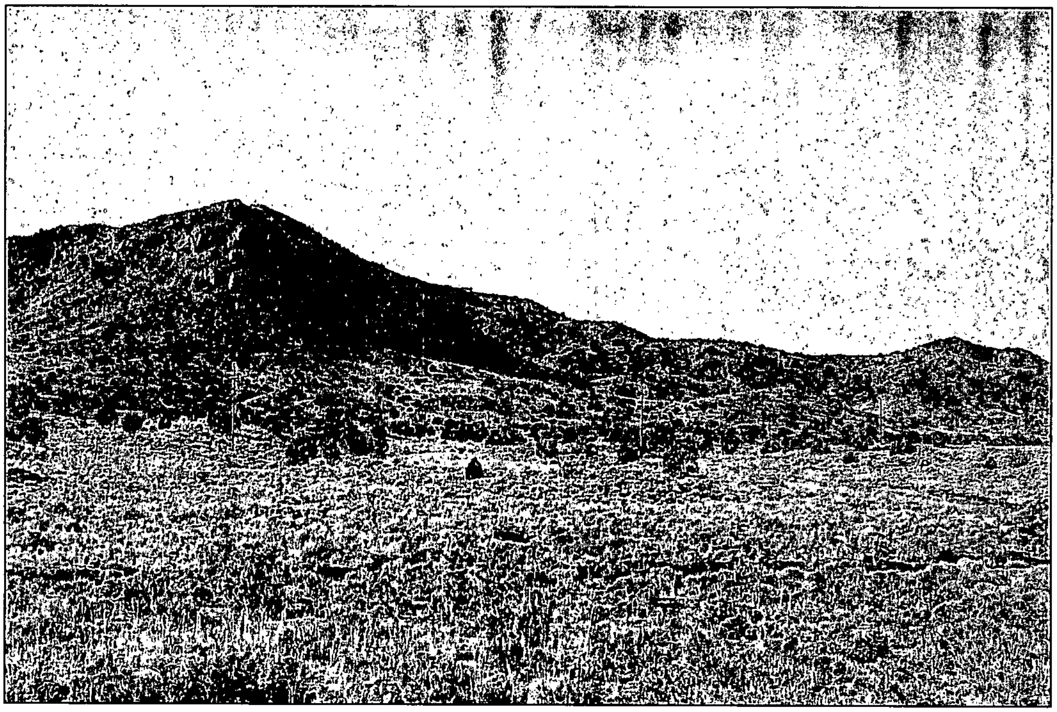


Figure D-58. View south-southwest from key observation point 23 on U.S. Highway 6 on east side of Warm Springs Summit.

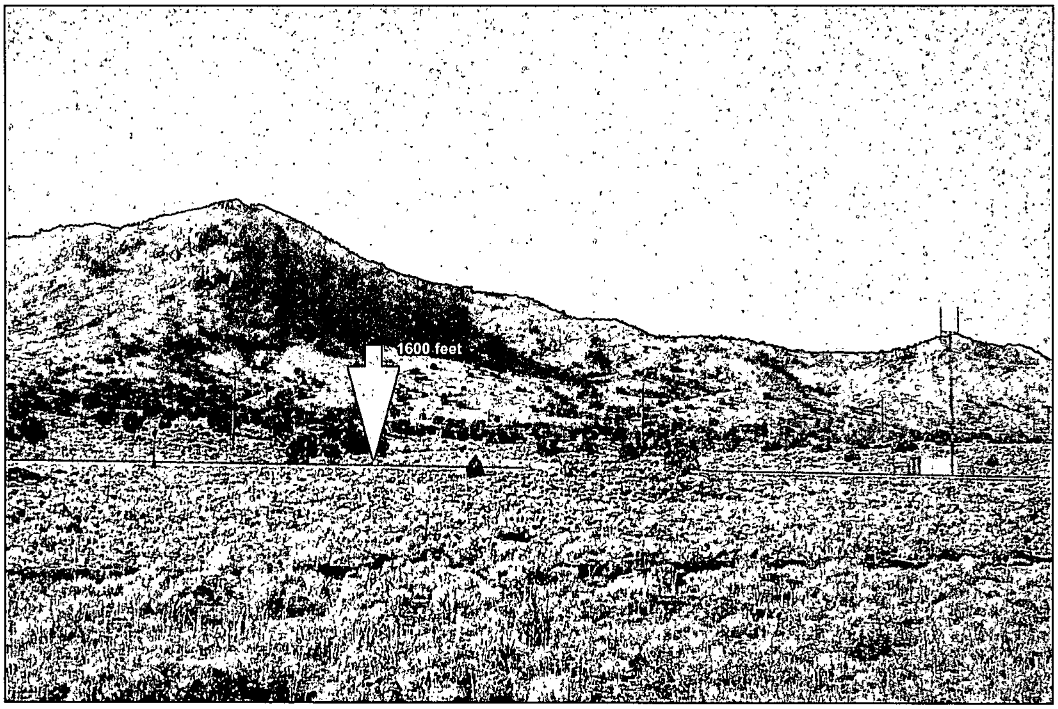


Figure D-59. Simulation of track in view south-southwest from key observation point 23. Note simulation of signal in left midground, communications tower in right midground. Power poles are not simulations.

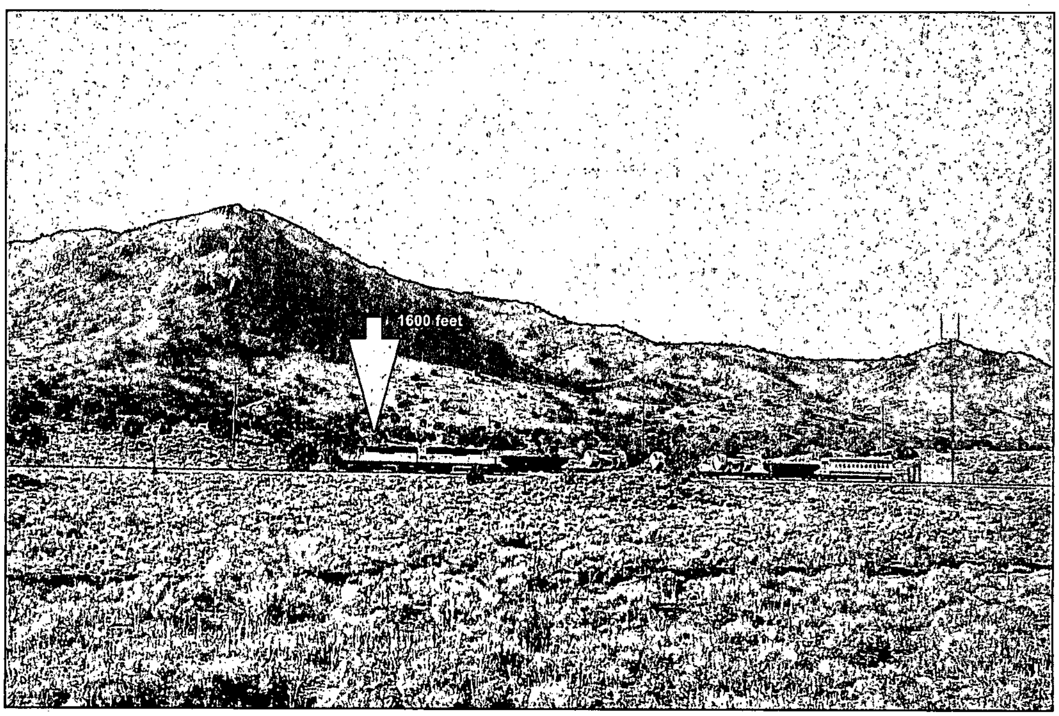


Figure D-60. Simulation of train in view south-southwest from key observation point 23. Note simulation of signal in left midground, communications tower in right midground. Power poles are not simulations.

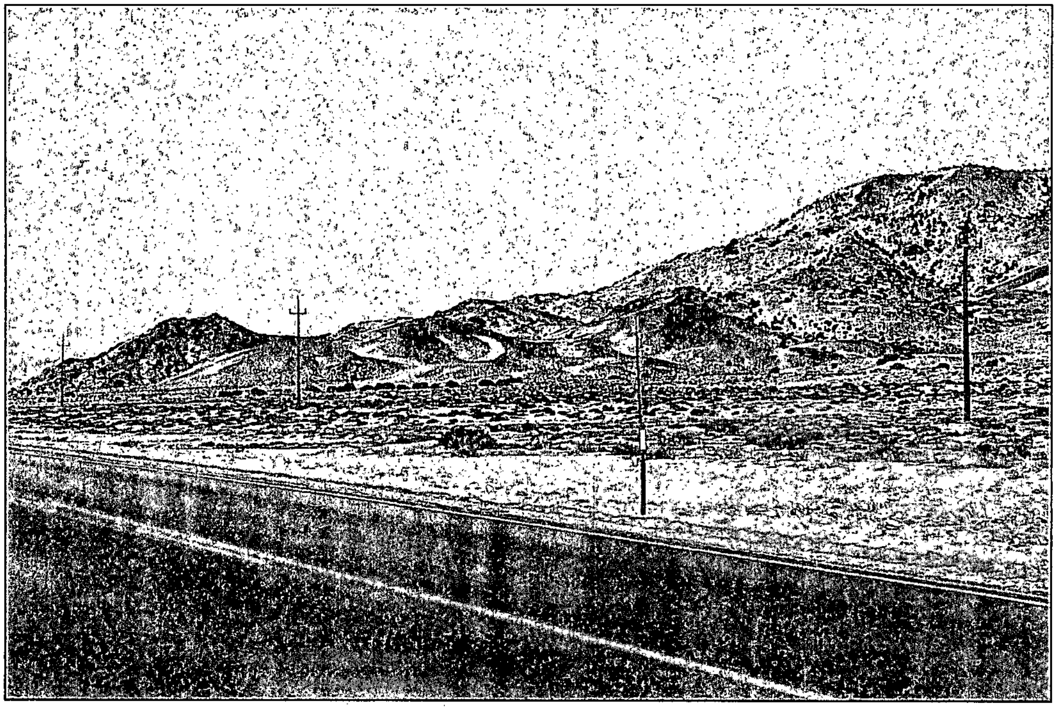


Figure D-61. View east-southeast from key observation point 24 on Highway 6 toward the Kawich Range at Warm Springs Summit.

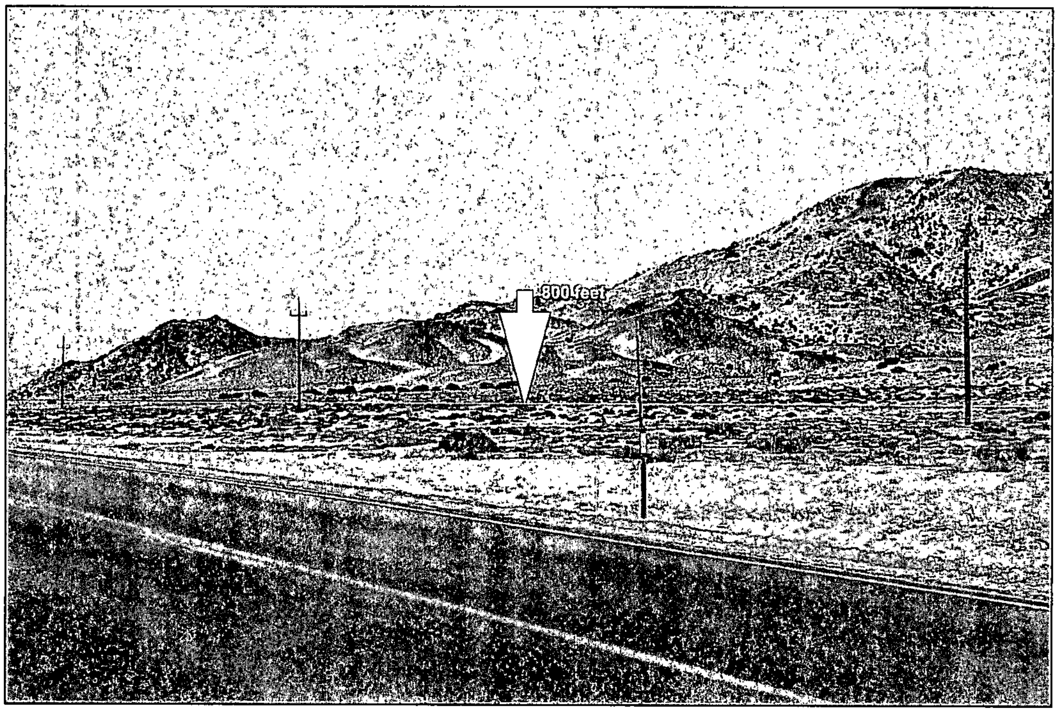


Figure D-62. Simulation of rail line in view east-southeast from key observation point 24. Track would be in a cut at this location so viewers would not see it, but the line of the cut would be discerned behind and roughly paralleling the power poles.

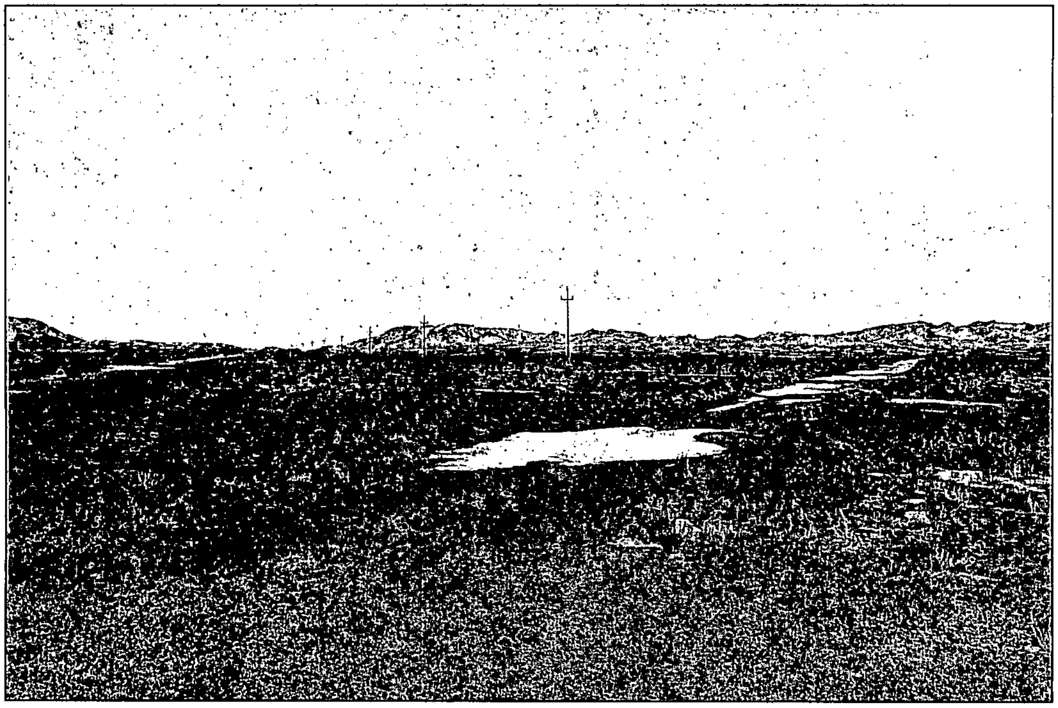


Figure D-63. View southeast from key observation point 25 on U.S. Highway 6 toward the Kawich Range. Highway visible on left, road to Clifford mine visible as snow track in center and right. Track would be in a cut at this location so viewers would not see it.

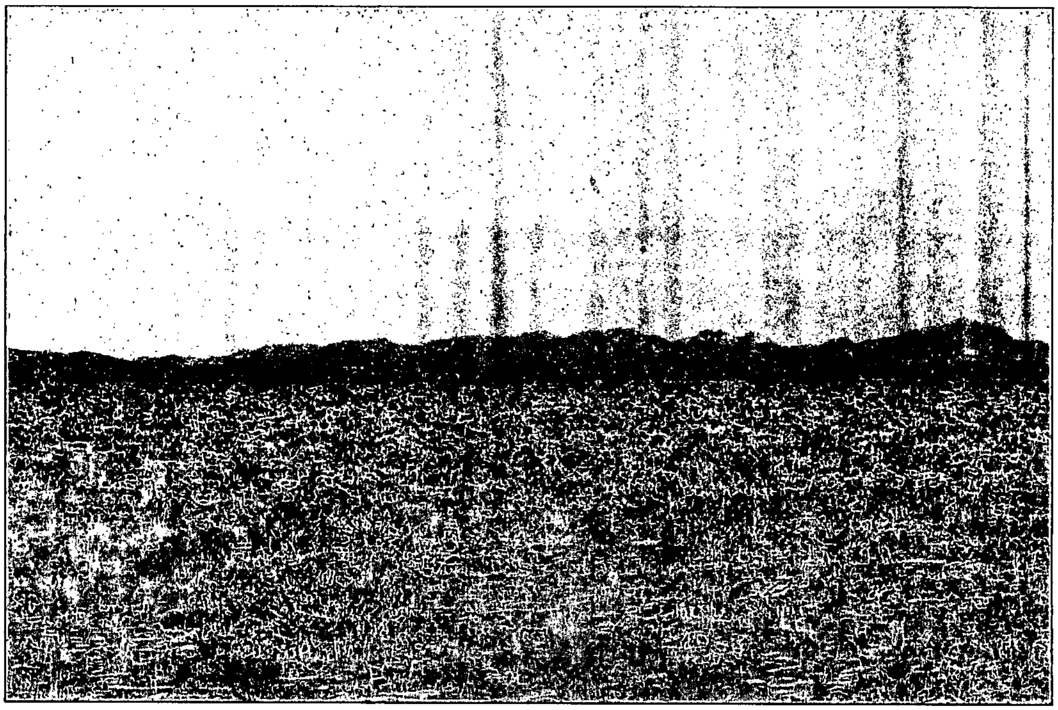


Figure D-64. View east-northeast toward the Kawich Range from key observation point 26 on Test and Training Range Road near location of rail line crossing.

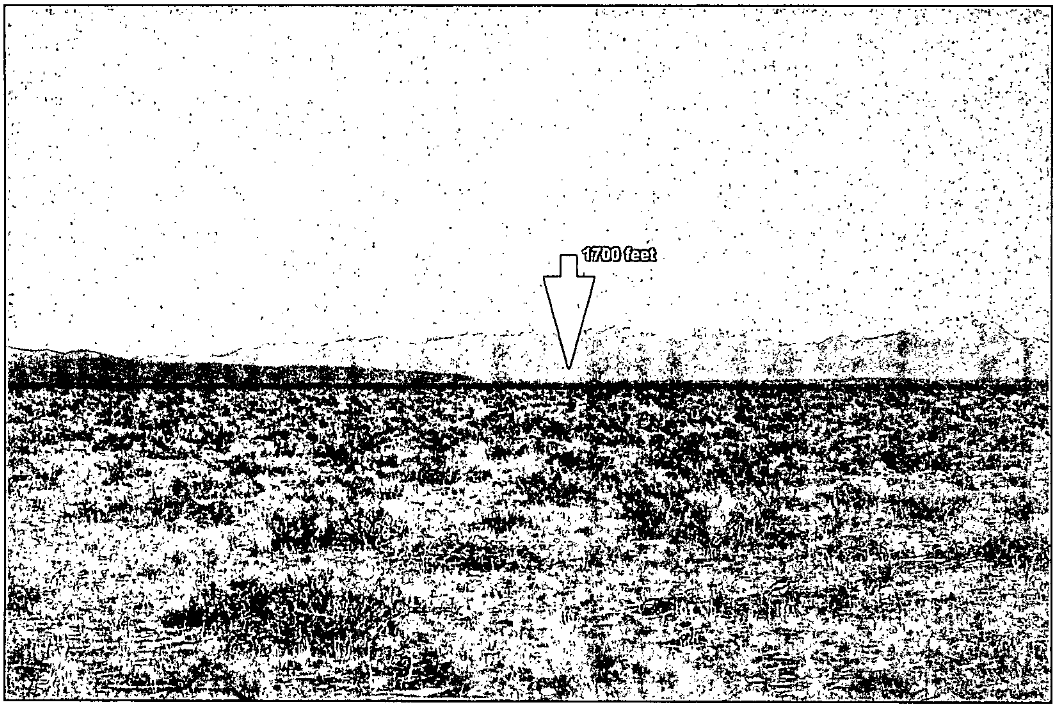


Figure D-65. Simulation of track in view east-northeast from key observation point 26.

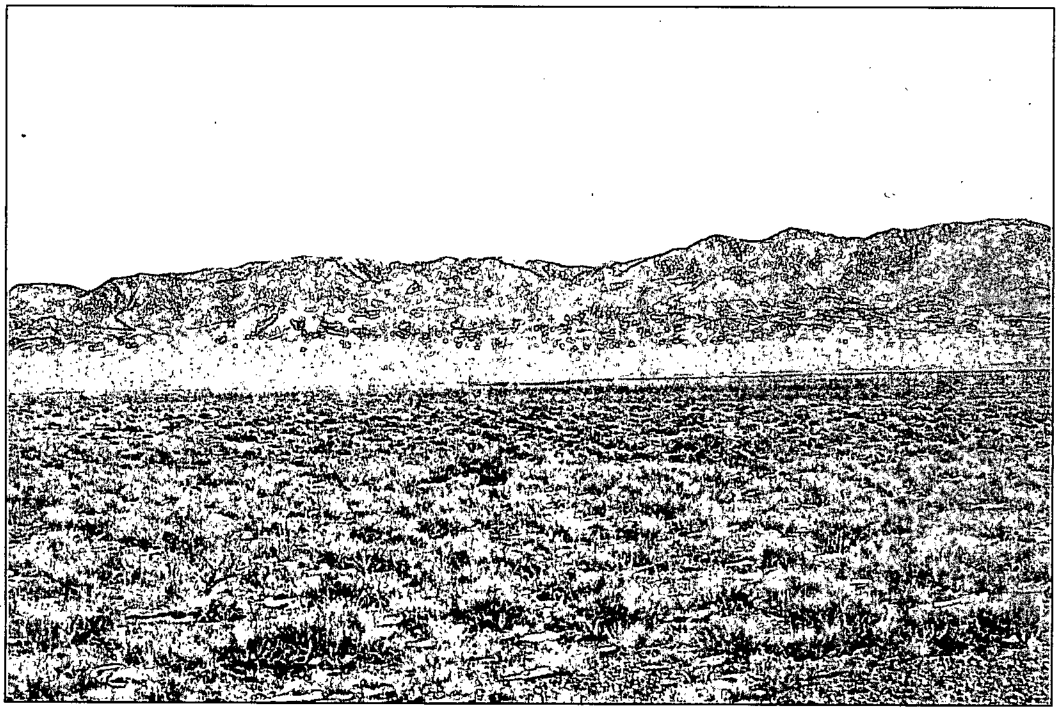


Figure D-66. View east-northeast toward the Kawich Range from key observation point 27 on Test and Training Range Road near location of rail line crossing. Reed's Ranch visible in center midground.

Figure D-67. View southwest toward Pilot Peak from key observation point 28 on U.S. Highway 6. Rail line would be approximately two thirds of the distance between viewer and mountains.

Figure D-68. View east-northeast from key observation point 29 north of Goldfield on U.S. Highway 95. Activities and facilities at possible quarry in hills at right side of photo could be seen but would not attract attention.

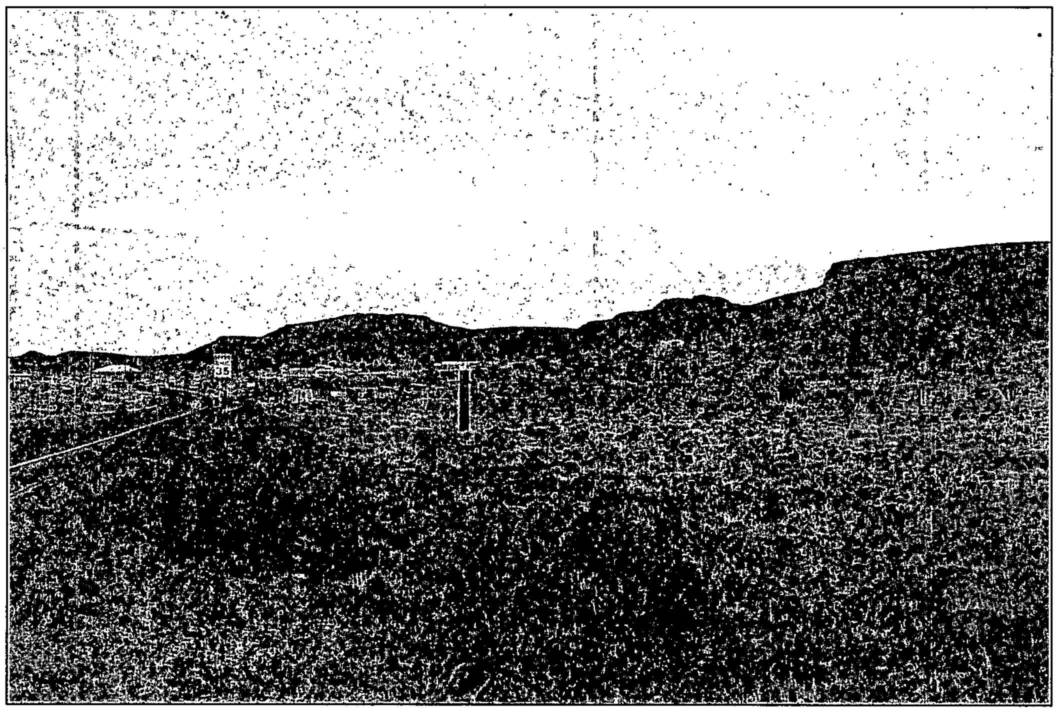


Figure D-69. View south-southeast from key observation point 30 at north end of Goldfield on U.S. Highway 95.

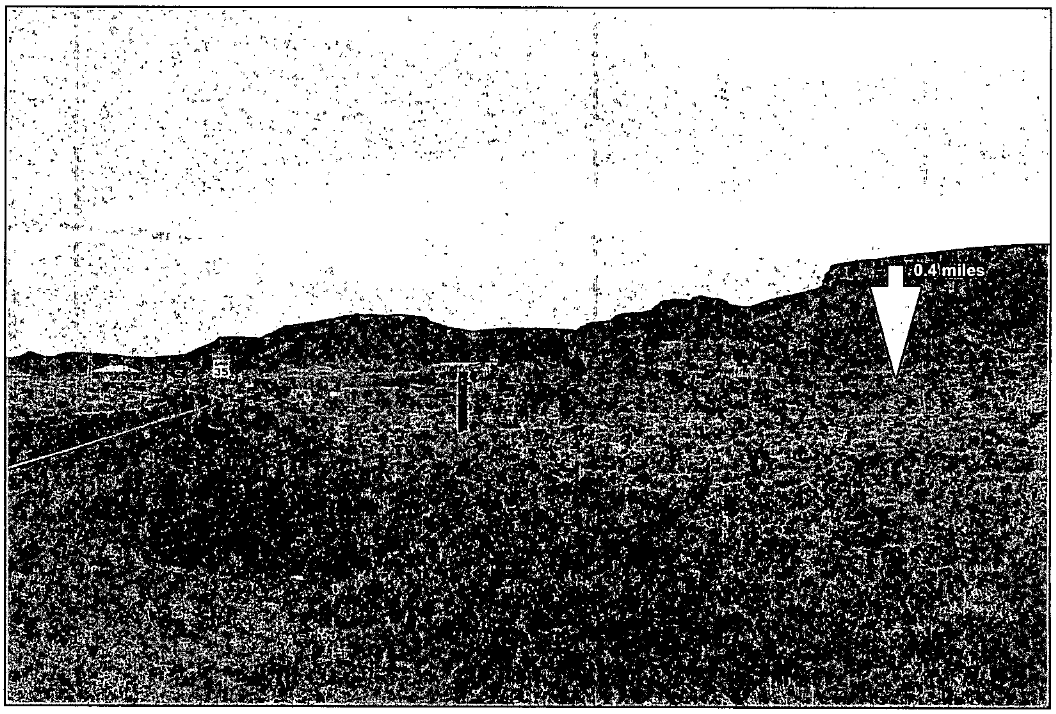


Figure D-70. Simulation of track on Goldfield alternative segment 4 in view from key observation point 30. Distance and topography would obscure much of the rail line.

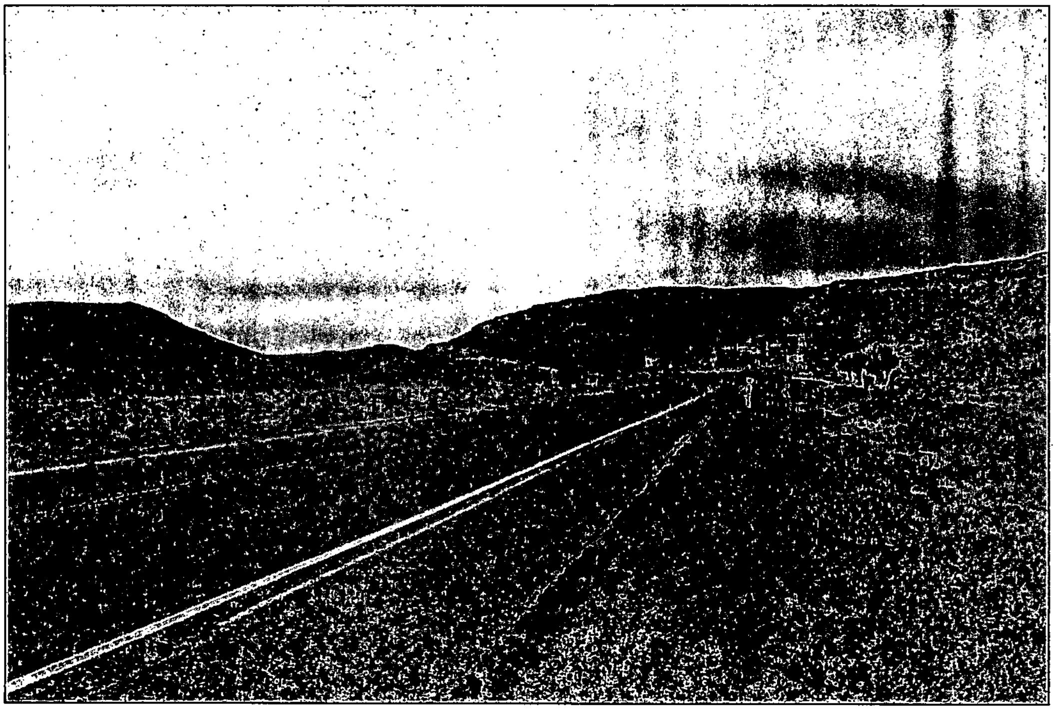


Figure D-71. View south-southeast from key observation point 31 on U.S. Highway 95 south of Goldfield.

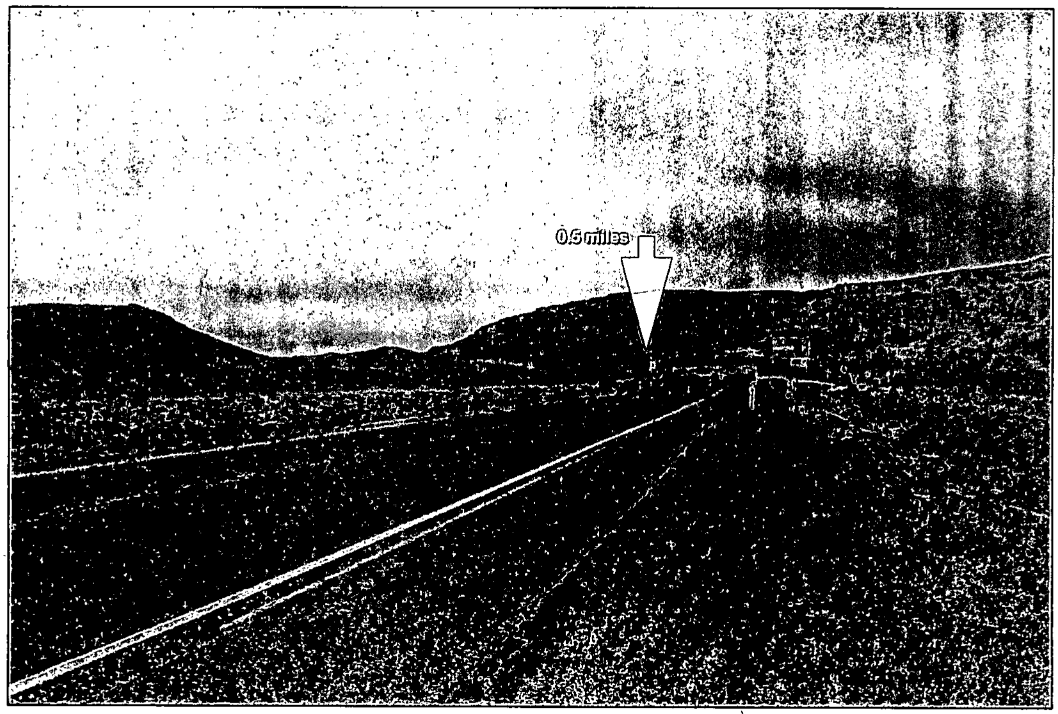


Figure D-72. Simulation of Goldfield alternative segment 4 crossing over U.S. Highway 95 in view south-southeast from key observation point 31.

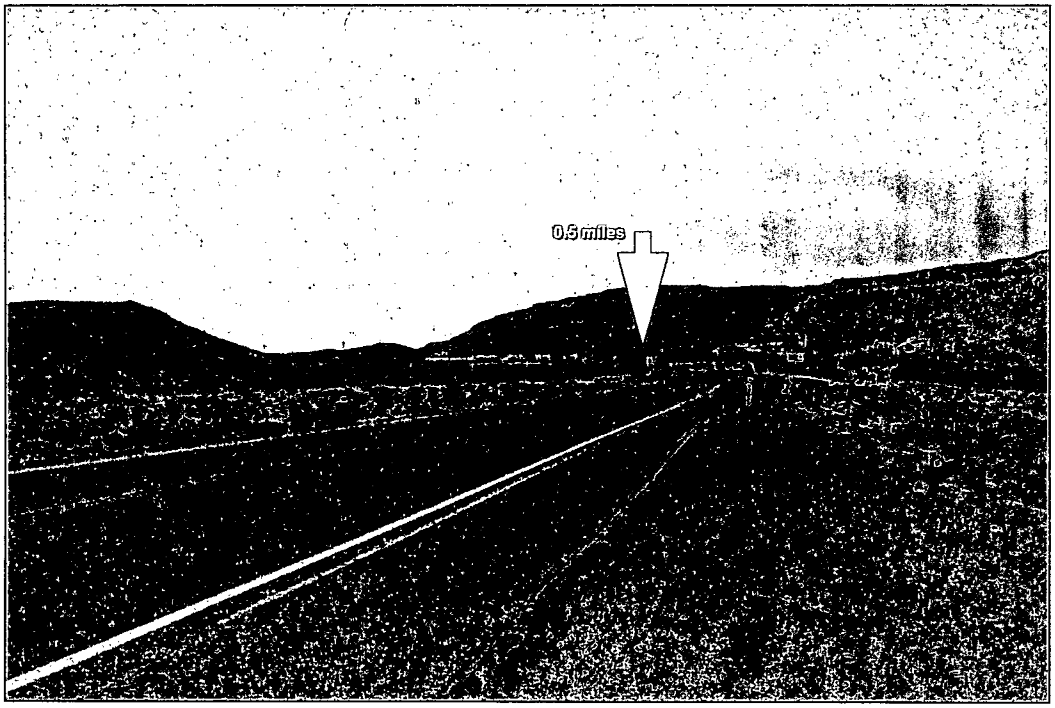


Figure D-73. Simulation of train on Goldfield alternative segment 4 in view south-southeast from key observation point 31.

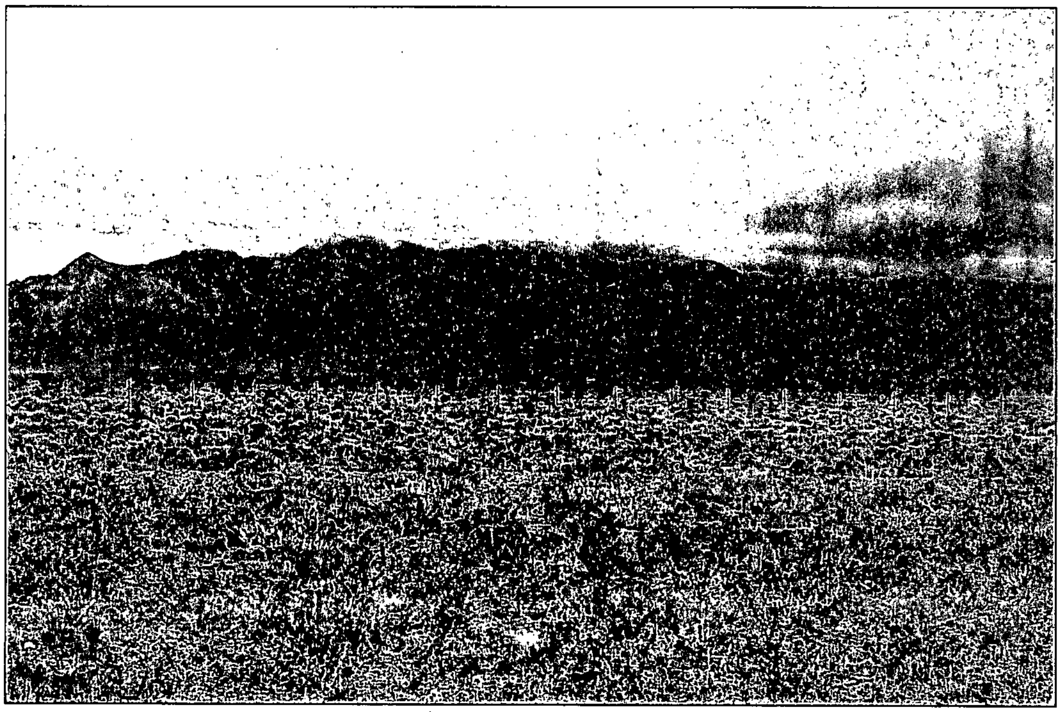


Figure D-74. View east toward Stonewall Mountain from key observation point 32 on U.S. Highway 95 at intersection with State Route 266.

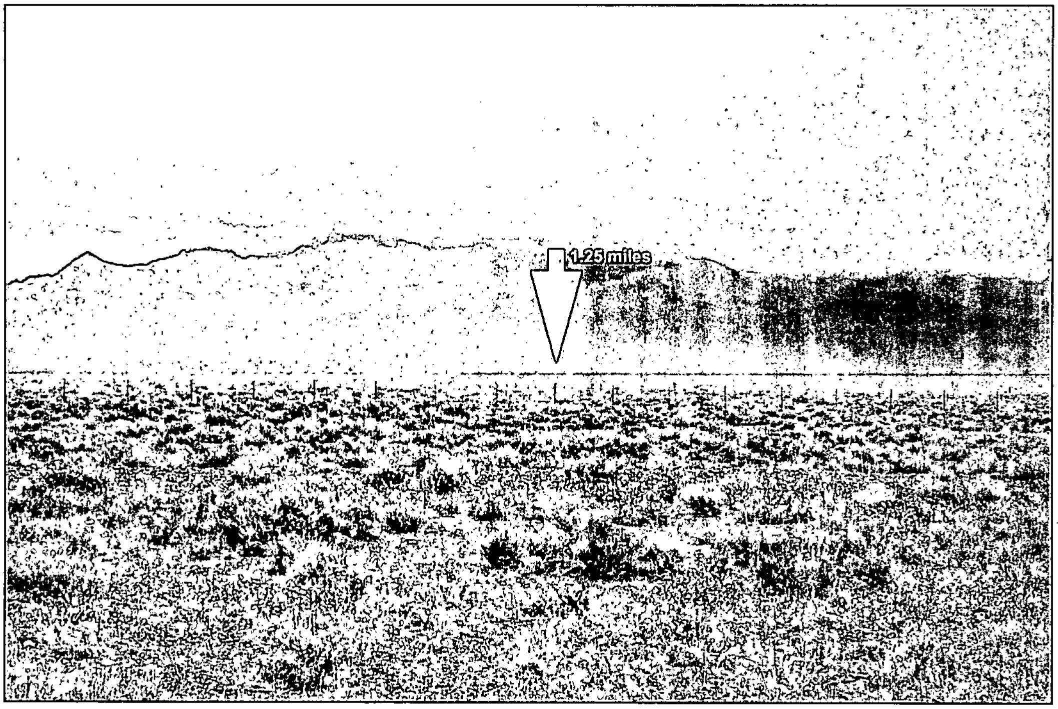


Figure D-75. Simulation of track in view east from key observation point 32. Stonewall Mountain in background.

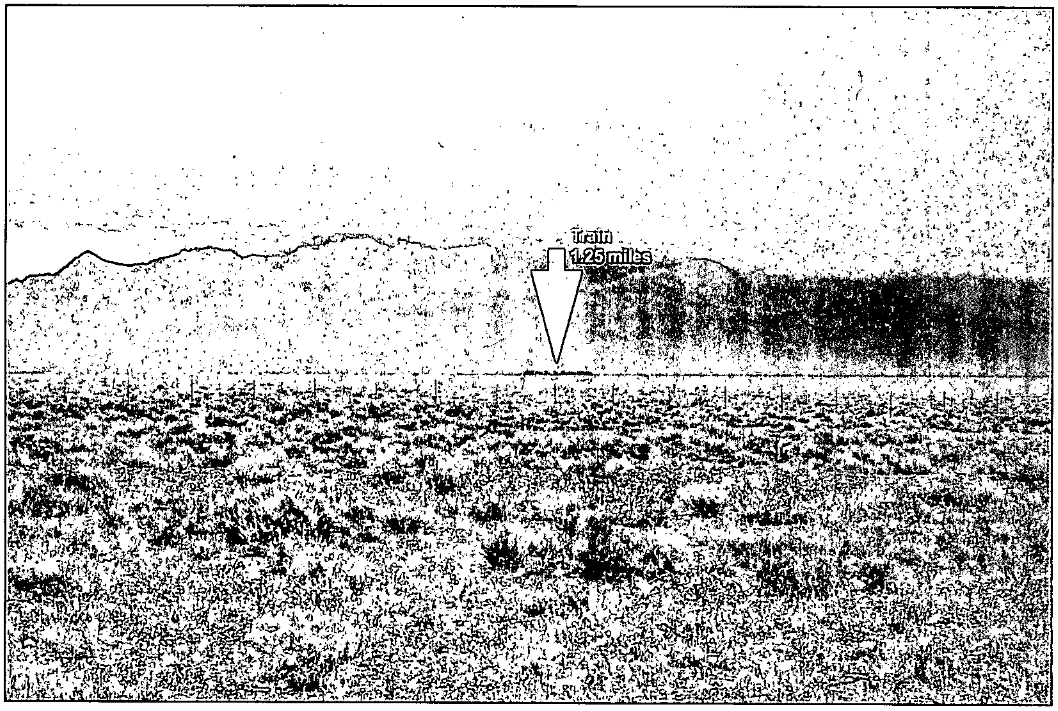


Figure D-76. Simulation of train in view east from key observation point 32. Stonewall Mountain in background.

Figure D-77. View north-northeast from key observation point 33 on U.S. Highway 95 at intersection with State Route 267. Rail line would be several miles in the distance.

Figure D-78. View southeast from key observation point 34 on U.S. Highway 95. Cut would remove lower slope at far right to keep rail line on flat grade.

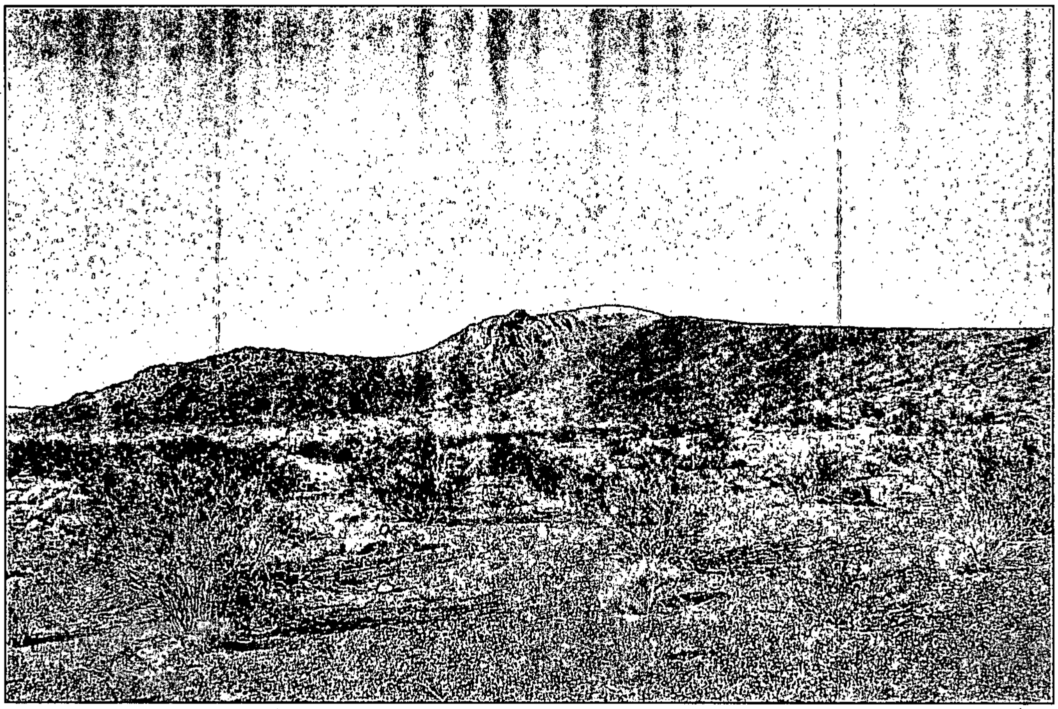


Figure D-79. View north from key observation point 34 on U.S. Highway 95 toward same cut location shown in Figure D-78. Cut would remove lower slope at far left to keep rail line on flat grade.

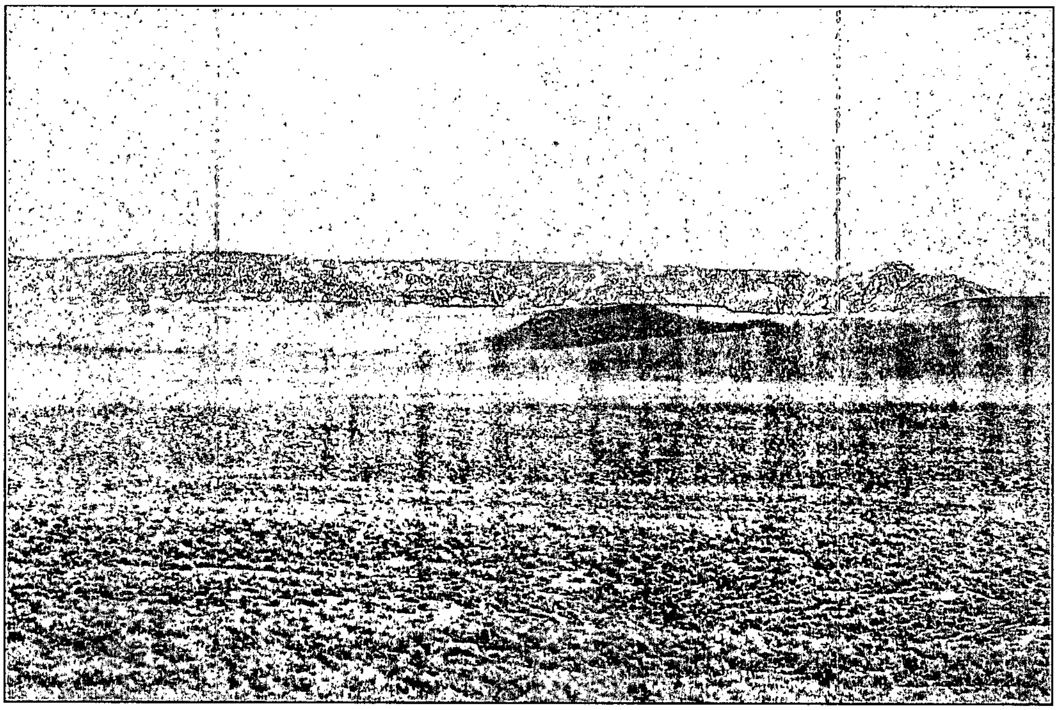


Figure D-80. View north-northeast from key observation point 35 on U.S. Highway 95 across a typical landscape. This most northerly of views from this point across the Amargosa River Valley toward Oasis Valley is where the rail line would be closest to the highway.

Figure D-81. View northeast from key observation point 36 on U.S. Highway 95 looking across the road that would be used for construction access to Beatty Wash. Rail line, bridge, and construction camp would not be visible from this point.

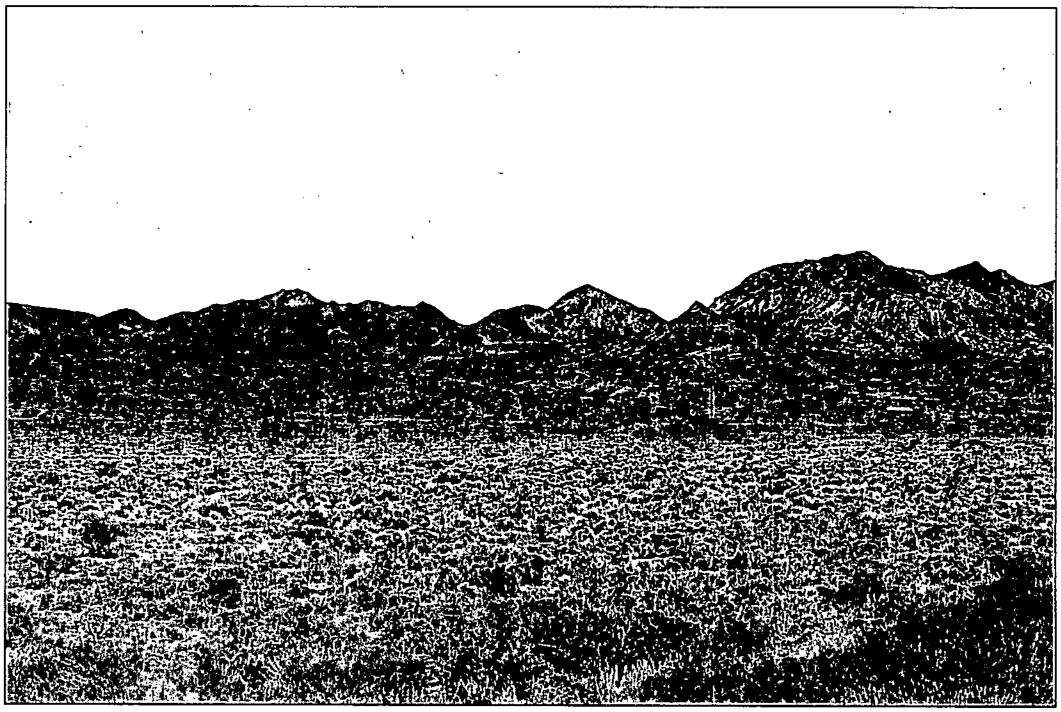


Figure D-82. View northeast from key observation point 37 on U.S. Highway 95.

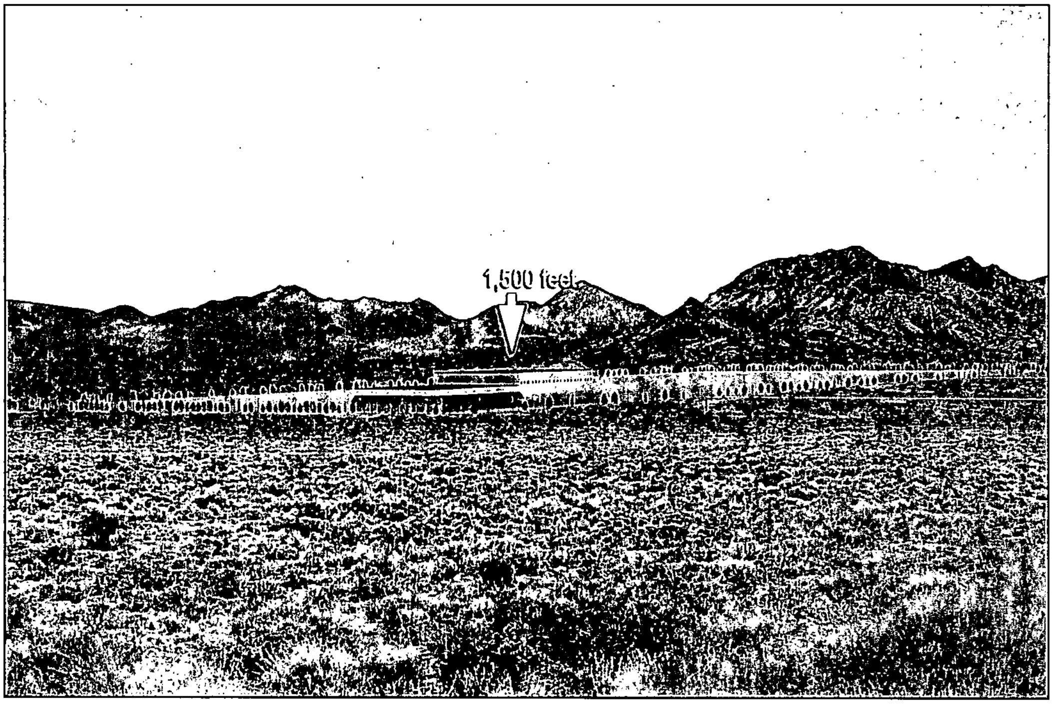
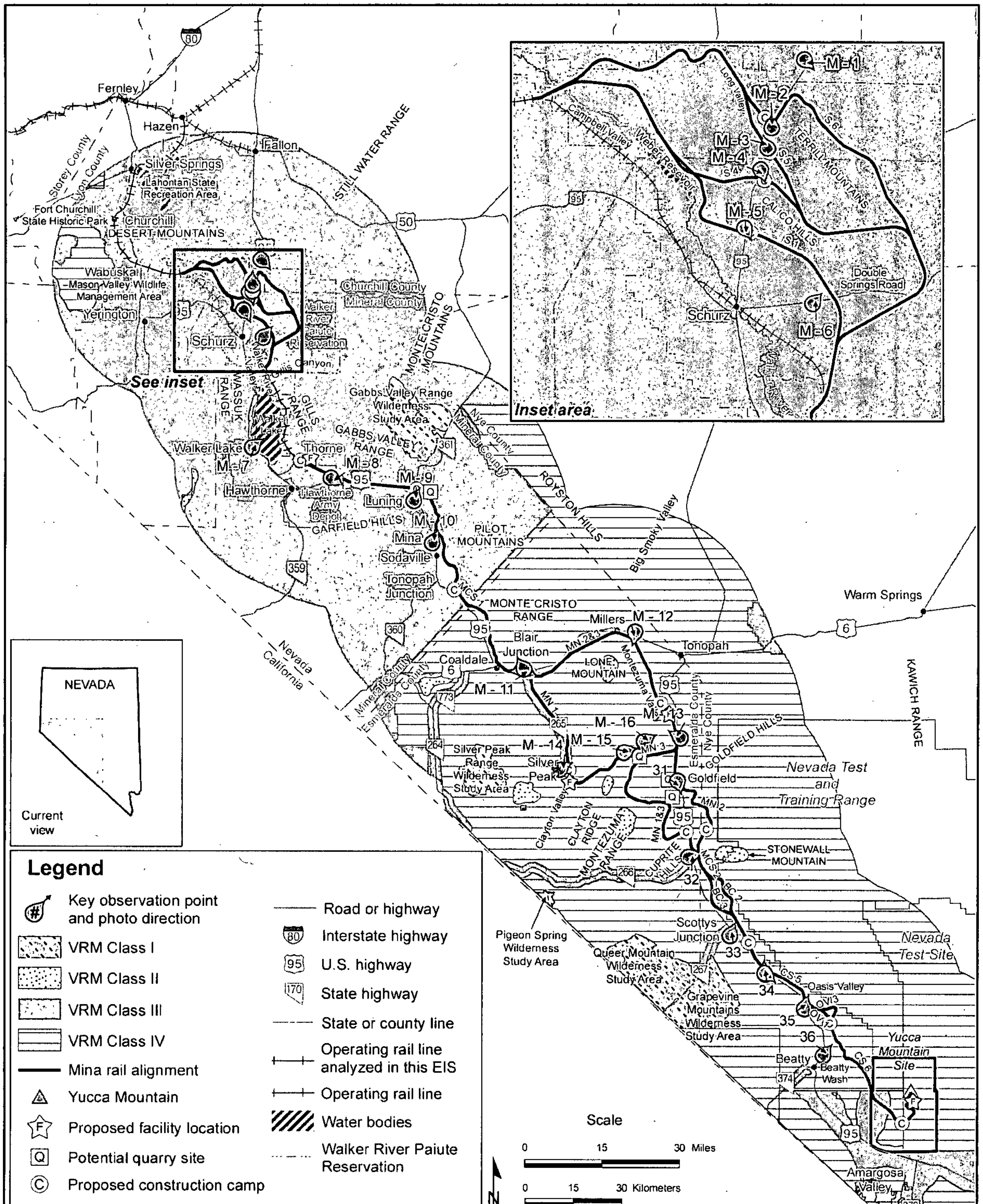


Figure D-83. Simulation of Maintenance-of-Way Headquarters Facility in view northeast from key observation point 37 on U.S. Highway 95.

D.2 Mina Rail Alignment

This section provides photographs taken from key observation points along the Mina rail alignment. For some views, DOE has added simulations to the baseline photographs to show how track, trains, or facilities would appear. Figure D-84 shows the locations of the key observation points and the BLM visual resource management classifications of the lands in the viewsheds. Key observation points 31 through 36 are the same as those shown in Section D.1 for the Caliente rail alignment.



Sources: Modified from DIRS 103079-BLM 1998, Map 2-9; DIRS 179571-Knight 2007, all; DIRS 173224-BLM 1997, pp. 6, 7, 27, and Map 8-9; DIRS 155970-DOE 2002, pp. 3-158 and 3-159.
Notes: VRM = Visual Resource Management; CS = common segment; MCS = Mina common segment; S = Schurz; MN = Montezuma; BC = Bonnie Claire; OV = Oasis Valley.

Figure D-84. Visual resource management classifications and key observation points along the Mina rail alignment.

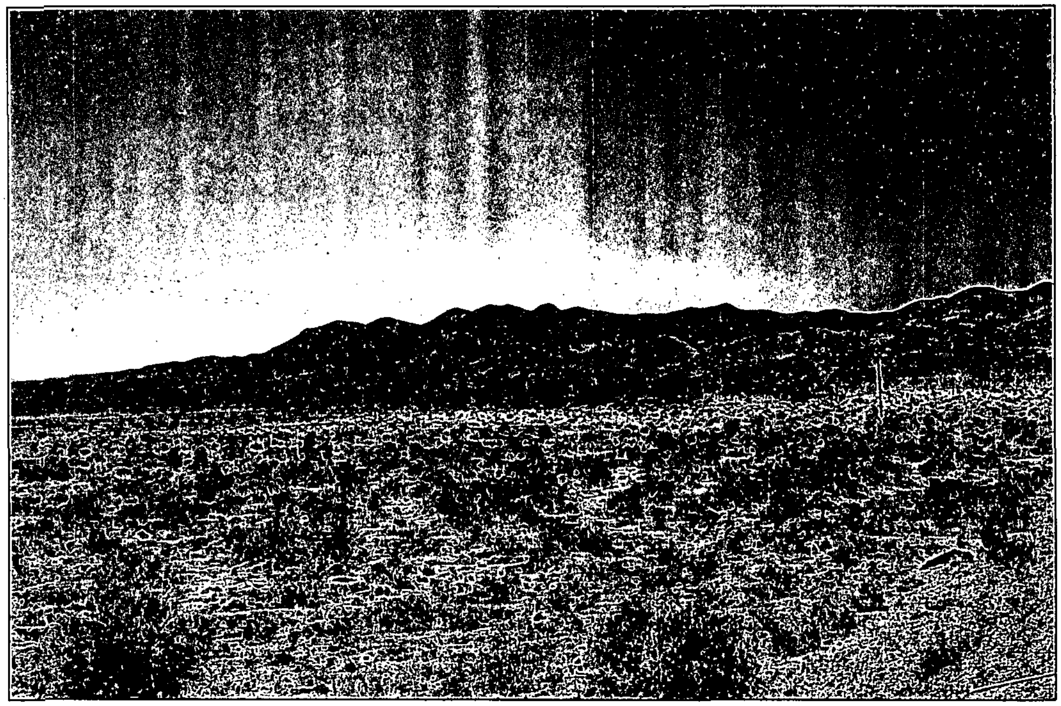


Figure D-85. View southeast from key observation point M-1 on U.S. Highway 95 toward location of Schurz alternative segment 6 against hills.

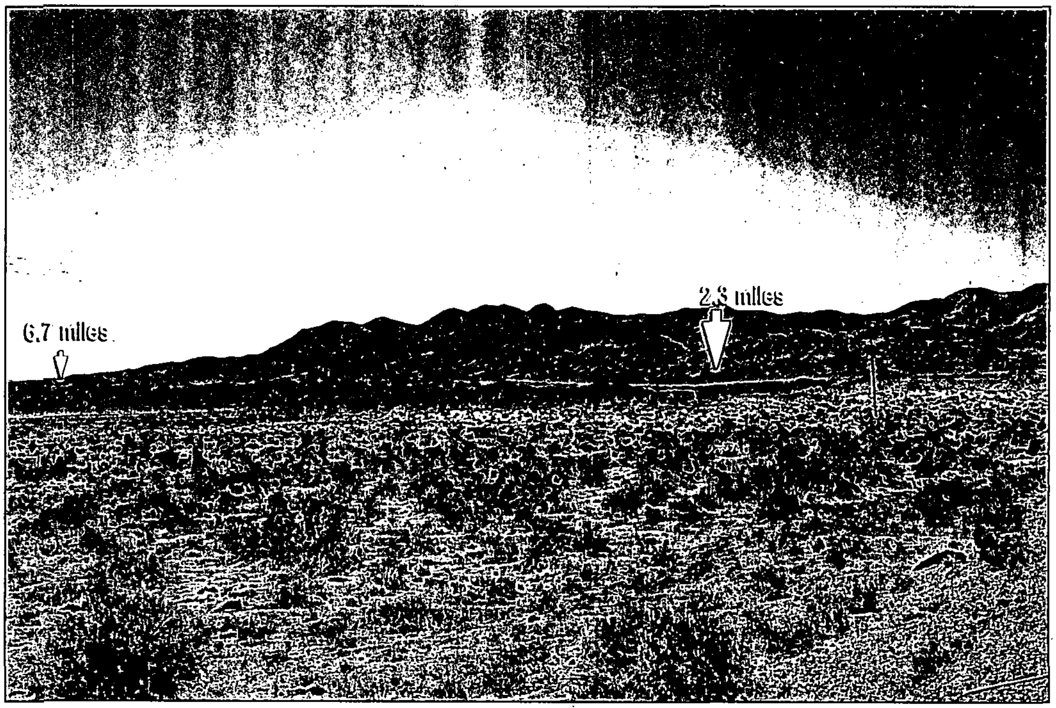


Figure D-86. Simulation of Schurz alternative segment 6 across Rawhide Flats southeast from key observation point M-1 on U.S. Highway 95.

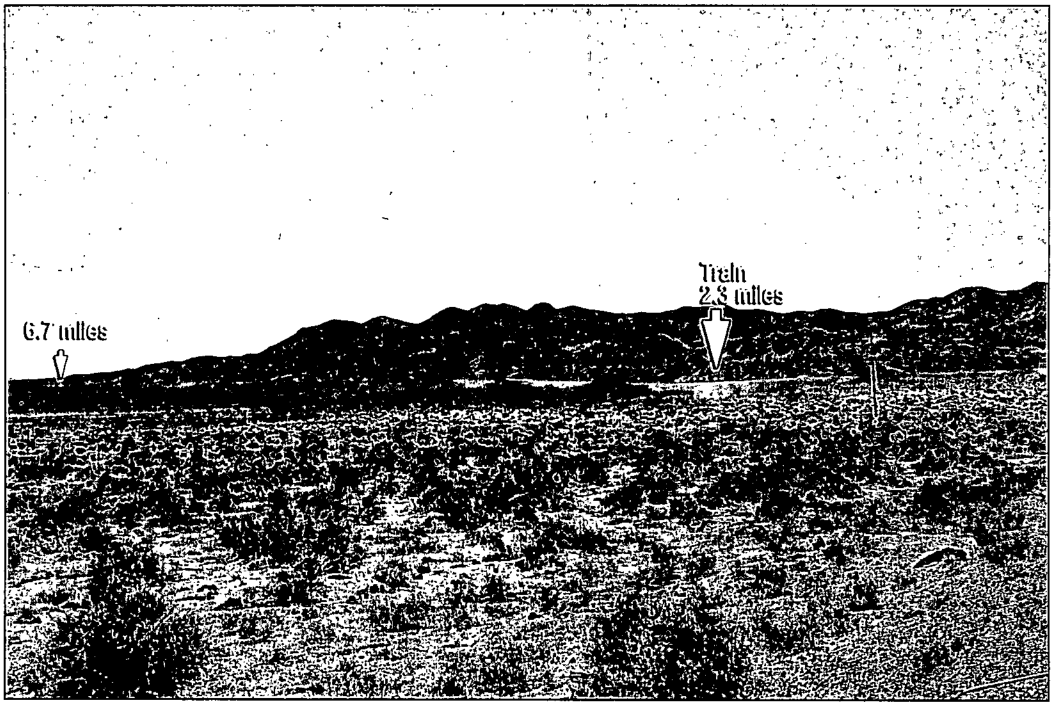


Figure D-87. Simulation of train on Schurz alternative segment 6 across Rawhide Flats southeast from key observation point M-1 on U.S. Highway 95.

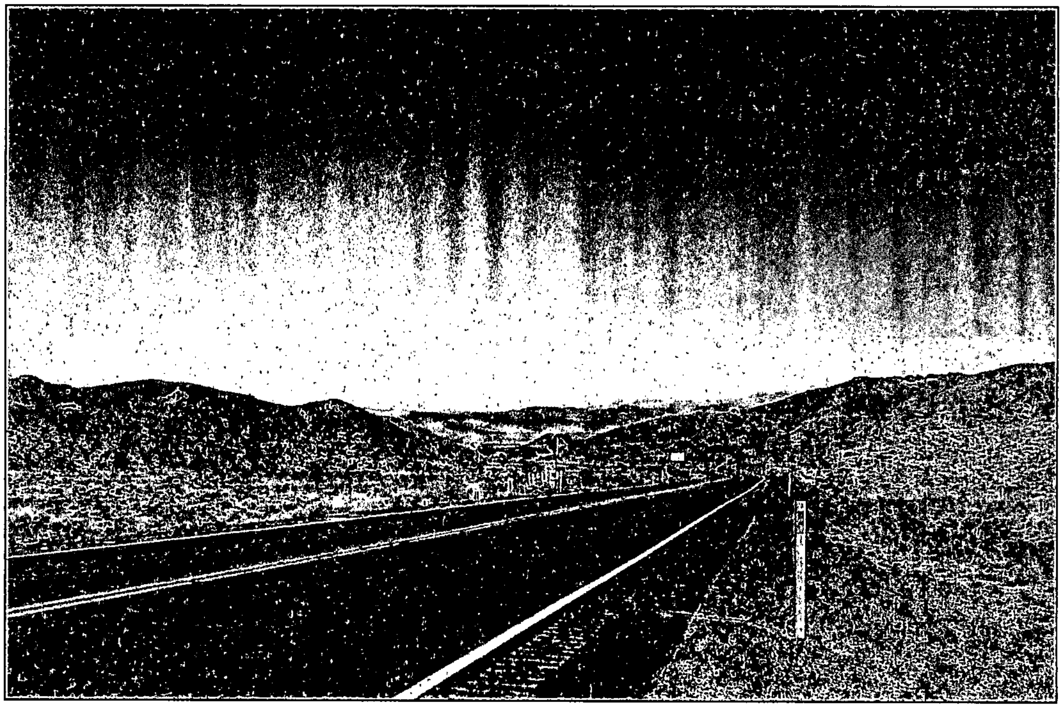


Figure D-88. View northeast from key observation point M-2 on U.S. Highway 95 toward location of Schurz alternative segment 6 and rail-over-road crossing.

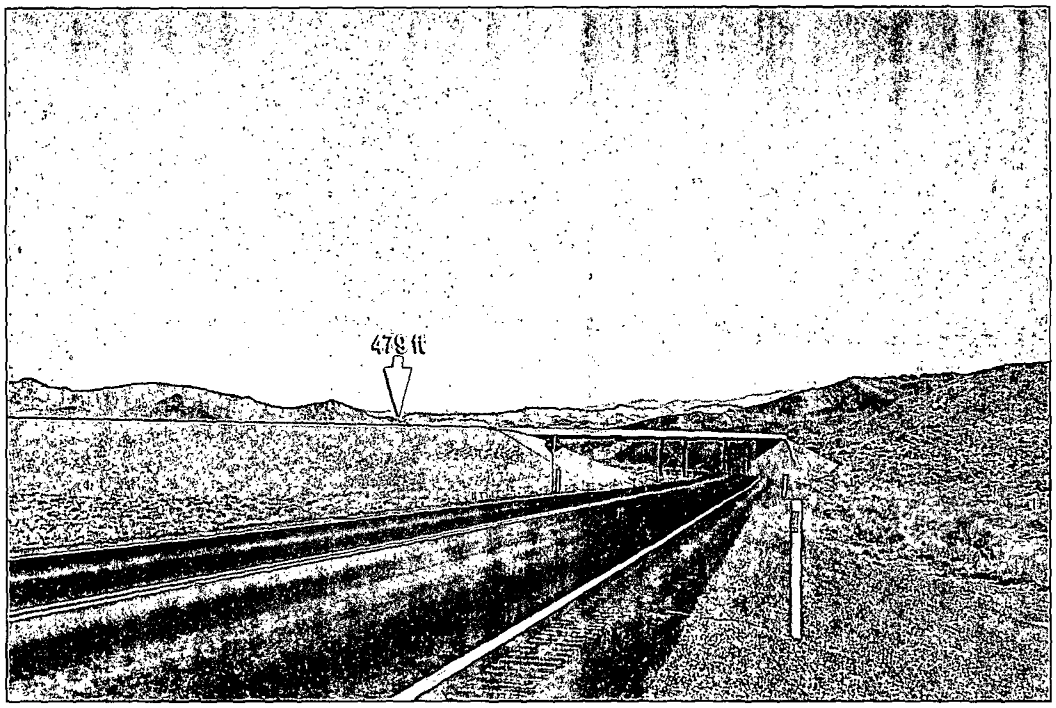


Figure D-89. Simulation of Schurz alternative segment 6 and grade-separated crossing of U.S Highway 95, view northeast from key observation point M-2.

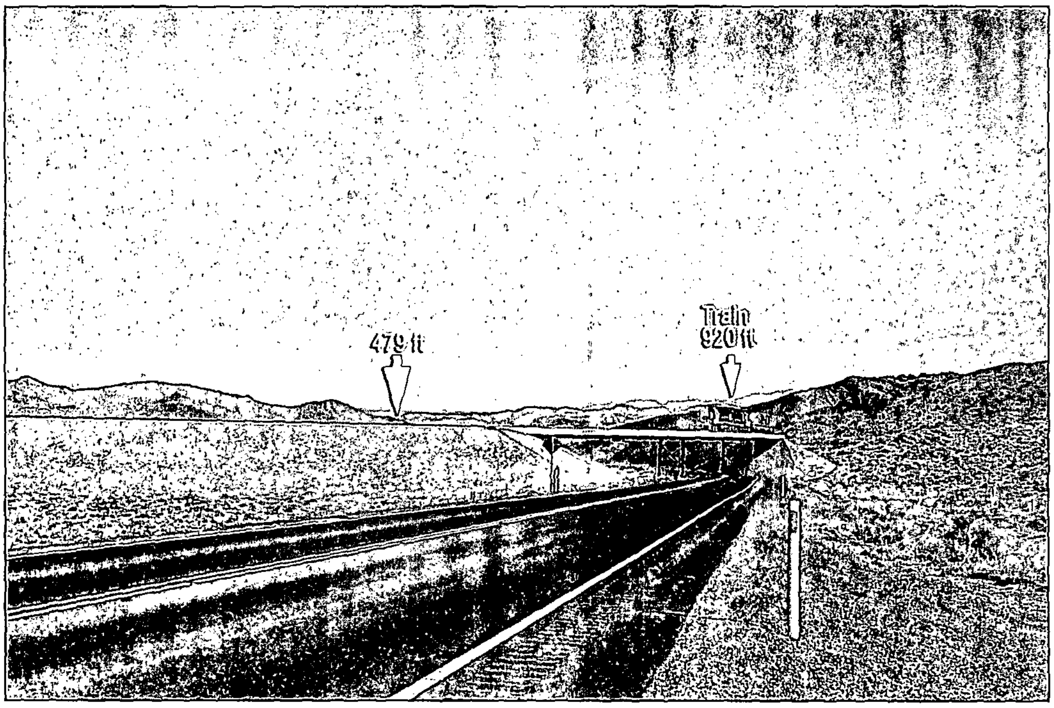


Figure D-90. Simulation of train on Schurz alternative segment 6 and grade-separated crossing of U.S Highway 95, view northeast from key observation point M-2.

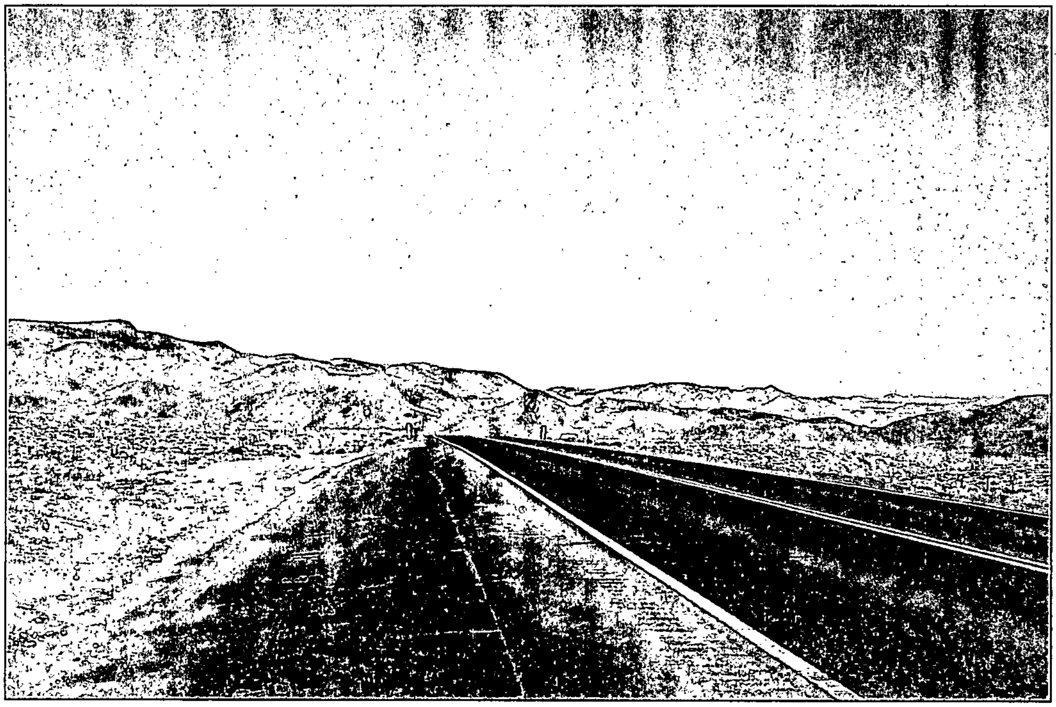


Figure D-91. View north in Long Valley, toward location of proposed grade-separated crossing of U.S. Highway 95 over Schurz alternative segment 5 from key observation point M-3.

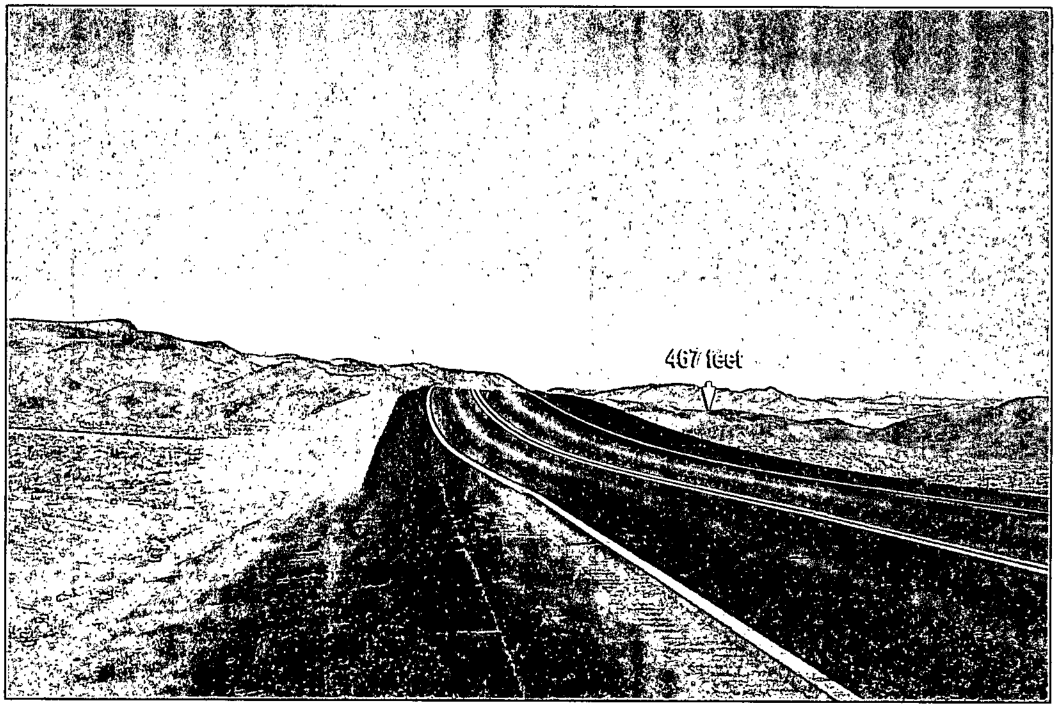


Figure D-92. U.S. Highway 95 in Long Valley, simulation of grade-separated crossing of U.S. Highway 95 over Schurz alternative segment 5 from key observation point M-3.

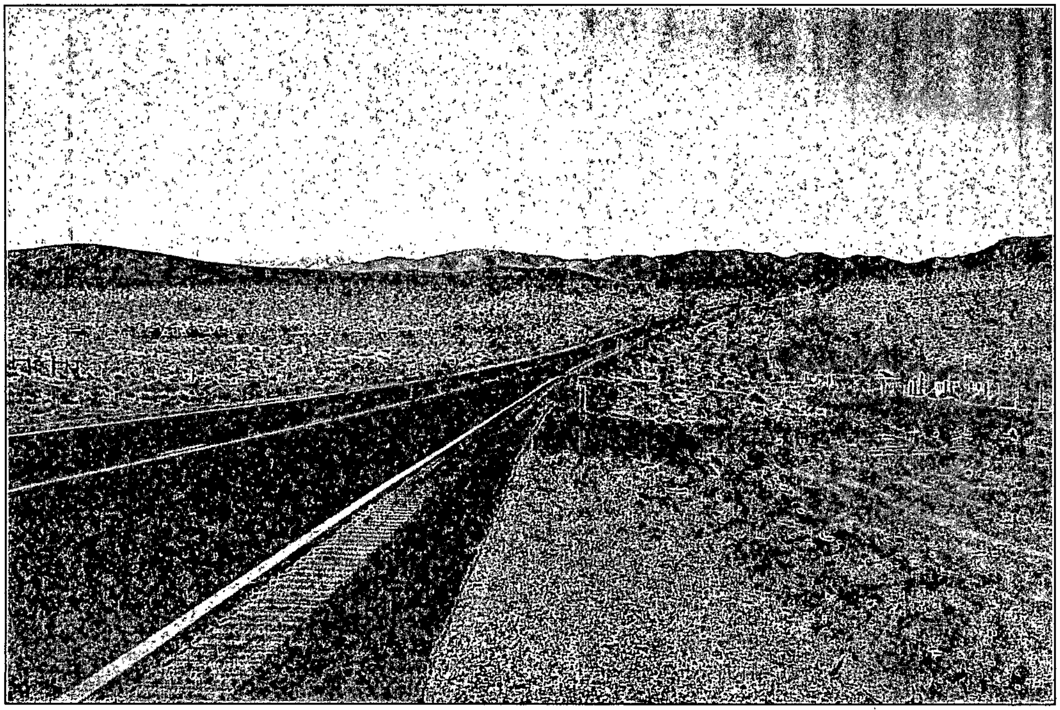


Figure D-93. View south from key observation point M-4 at intersection of U.S. Highway 95 and Weber Dam Road, toward location of Schurz alternative segment 4 and grade-separated crossing.

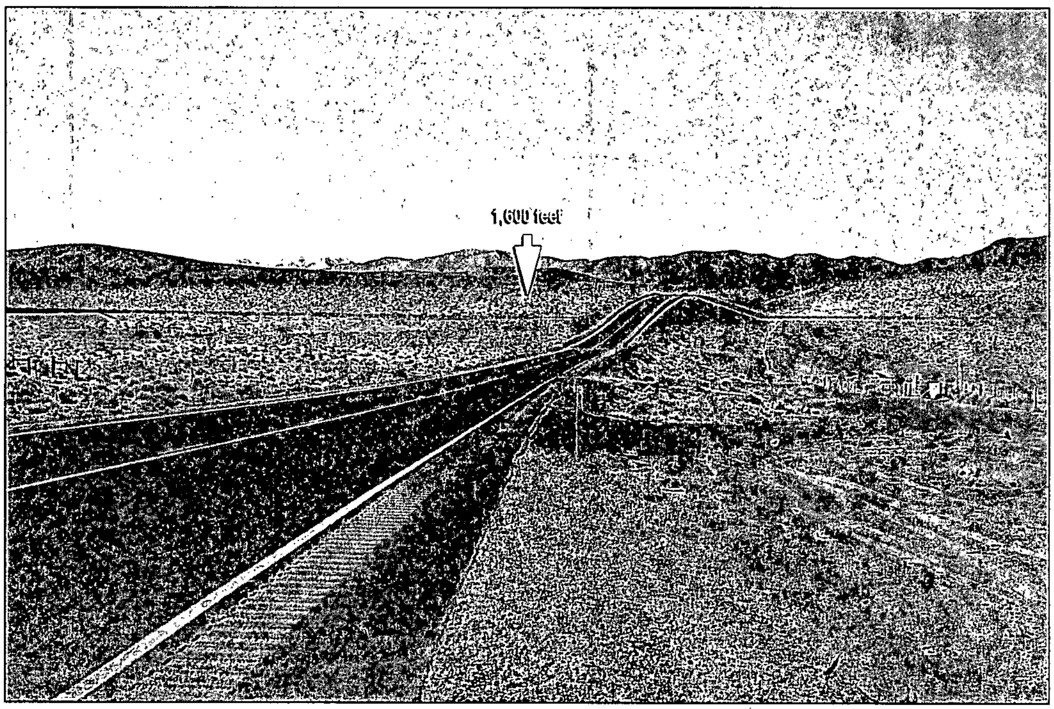


Figure D-94. Simulation of U.S. Highway 95 grade-separated crossing and Schurz alternative segment 4; view south from key observation point M-4 near intersection of highway and Weber Dam Road.

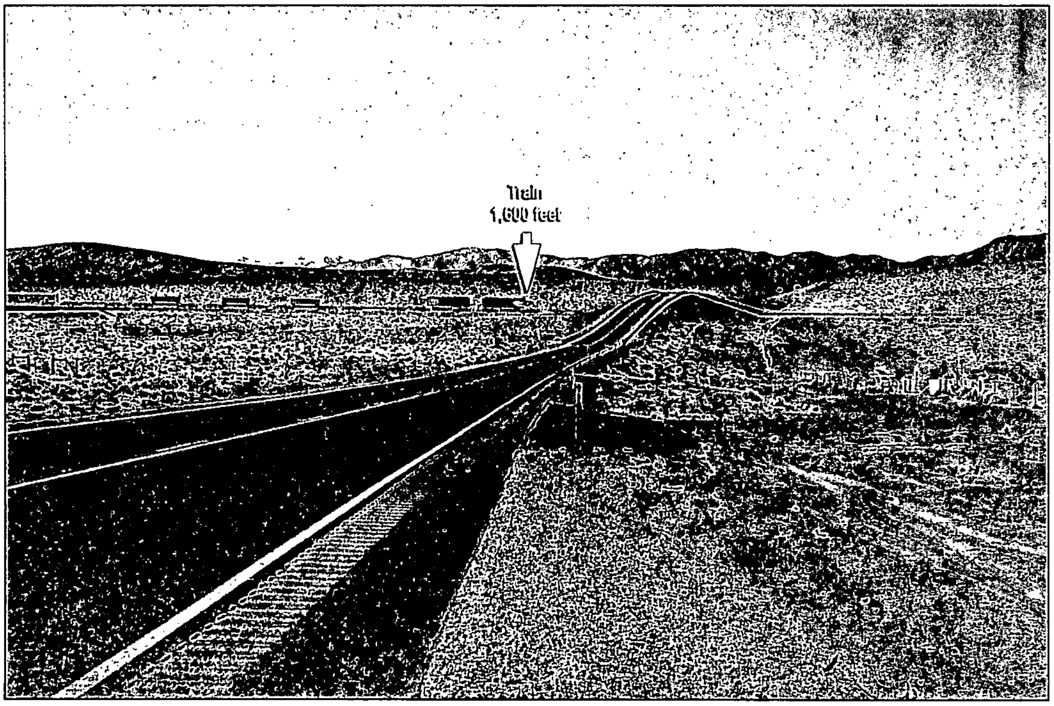


Figure D-95. Simulation of U.S. Highway 95 grade-separated crossing and train on Schurz alternative segment 4, view south from key observation point M-4 near intersection of highway and Weber Dam Road.

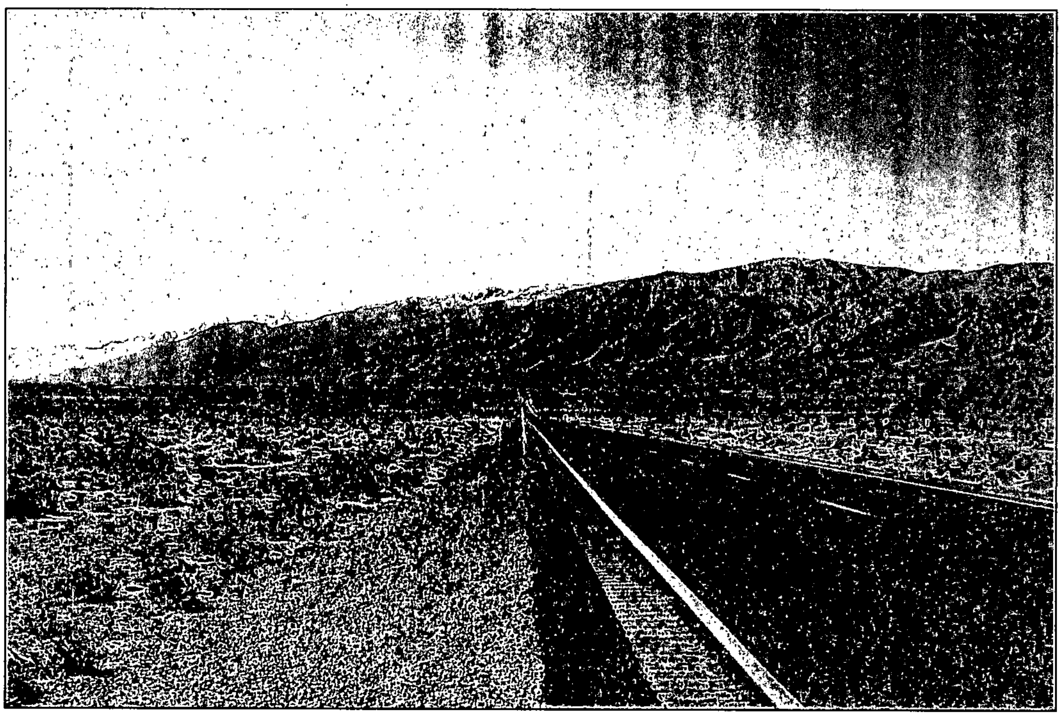


Figure D-96. View south from key observation point M-5 on U.S. Highway 95 east of Schurz alternative segments, toward location of Schurz alternative segment 1 grade-separated crossing.

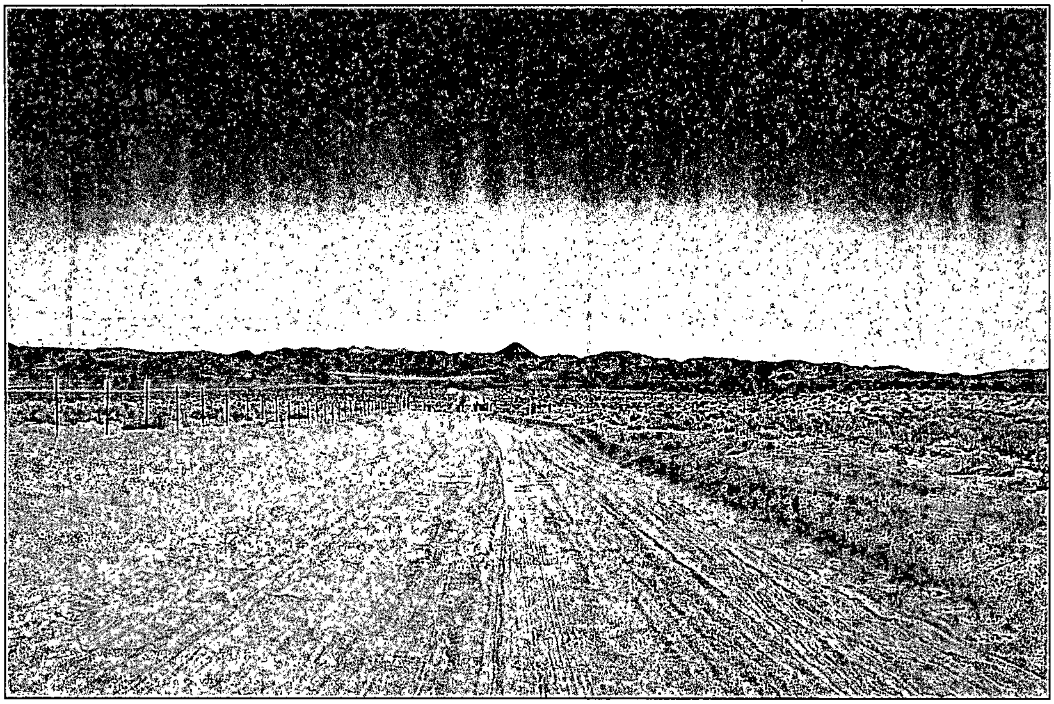


Figure D-97. View east from key observation point M-6 on Double Springs Road toward location of at-grade crossing of Schurz alternative segment 1.

Figure D-98. Simulation of at-grade Double Springs Road crossing and Schurz alternative segment 1, view east from key observation point M-6.

Figure D-99. Simulation of at-grade Double Springs Road crossing and train on Schurz alternative segment 1, view east from key observation point M-6.

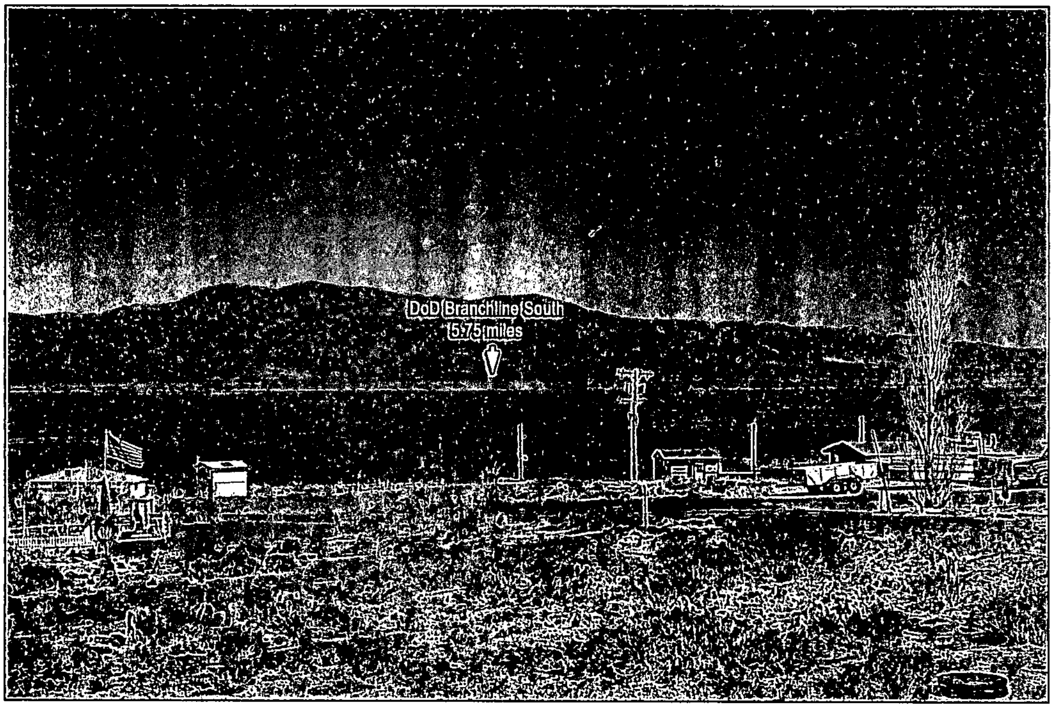


Figure D-100. View east from key observation point M-7 in the town of Walker Lake across lake toward existing Department of Defense Branchline South. Photo shows the visibility of the existing line at distance of 9.3 kilometers (5.8 miles).

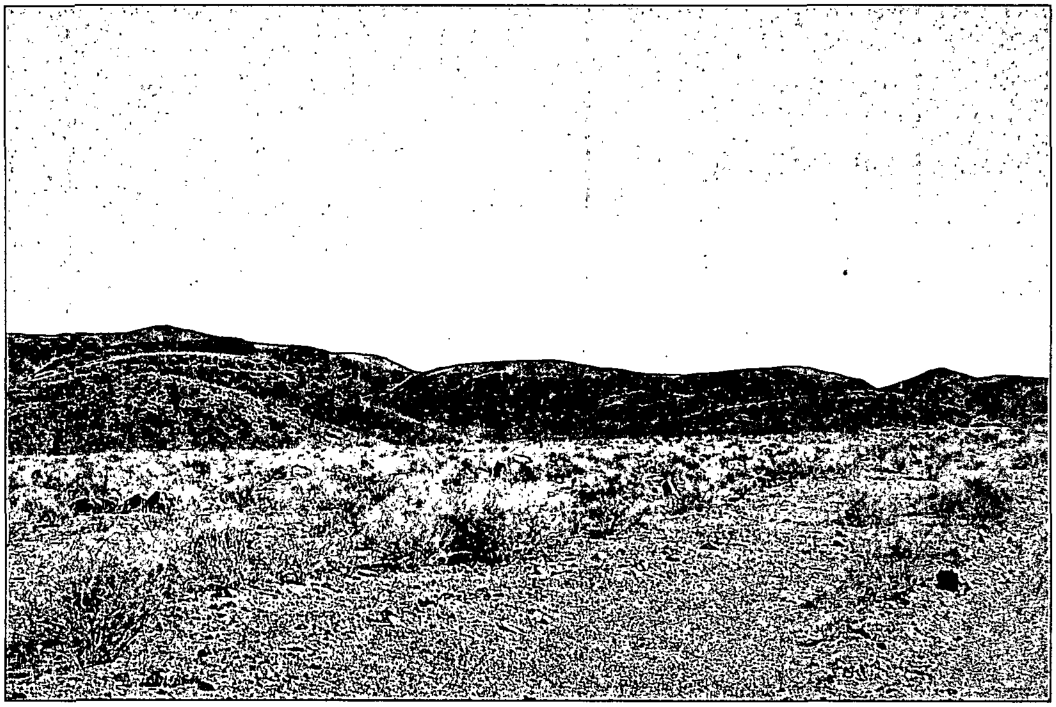


Figure D-101. View southeast from key observation point M-8 on U.S. Highway 95 just east of Hawthorne toward location of potential Garfield Hills quarry facilities.

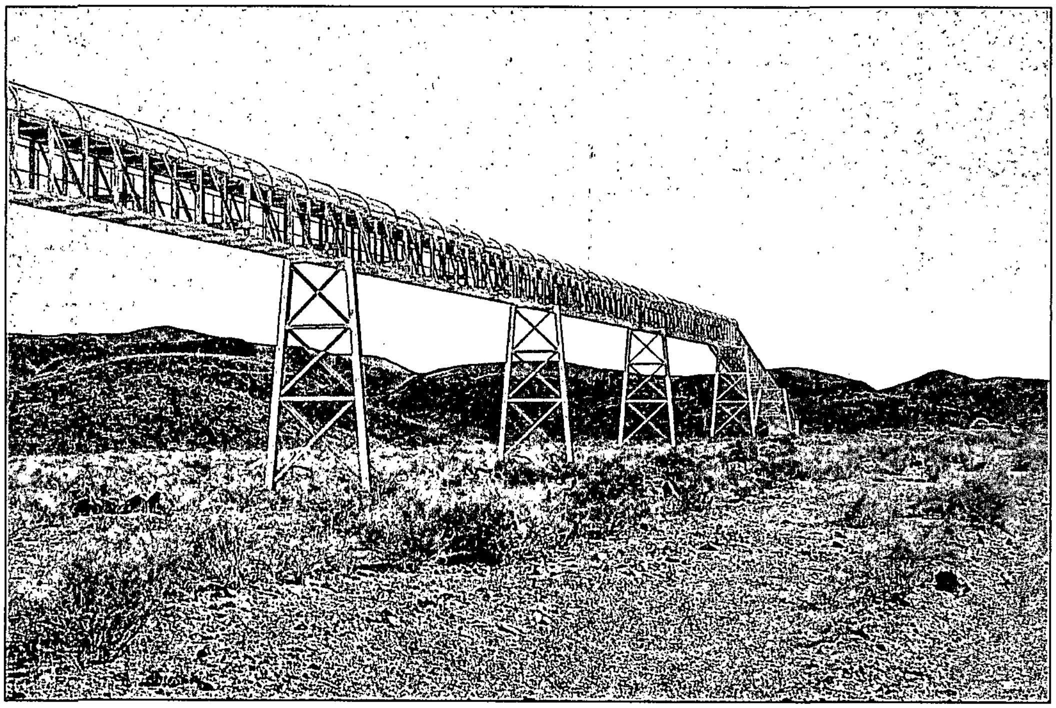


Figure D-102. Simulation of Garfield Hills quarry facilities in view southeast from key observation point M-8 on U.S. Highway 95.

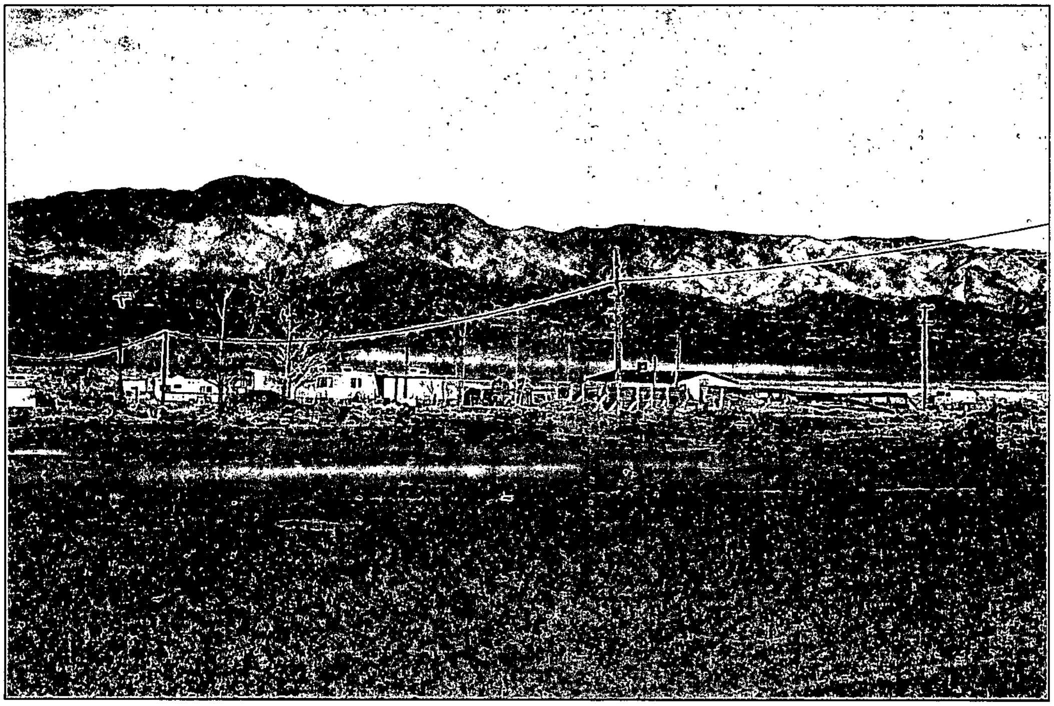


Figure D-103. View east from key observation point M-9 in the town of Luning toward potential Gabbs Range quarry site.

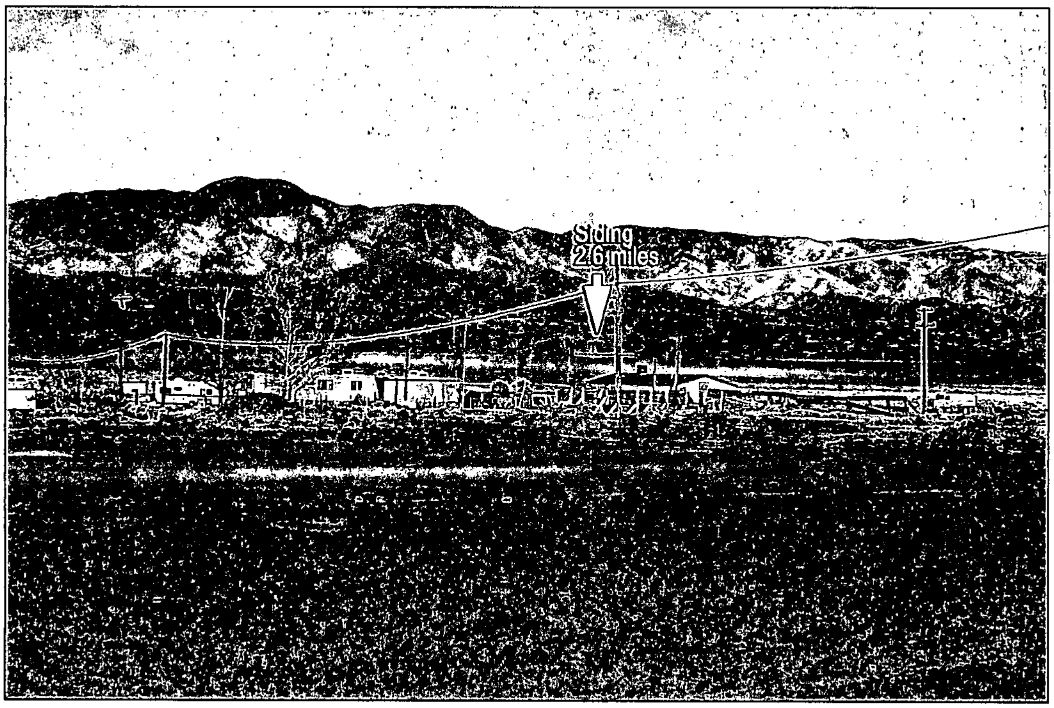


Figure D-104. Simulation of Gabbs Range quarry from key observation point M-9 in view east from Luning.

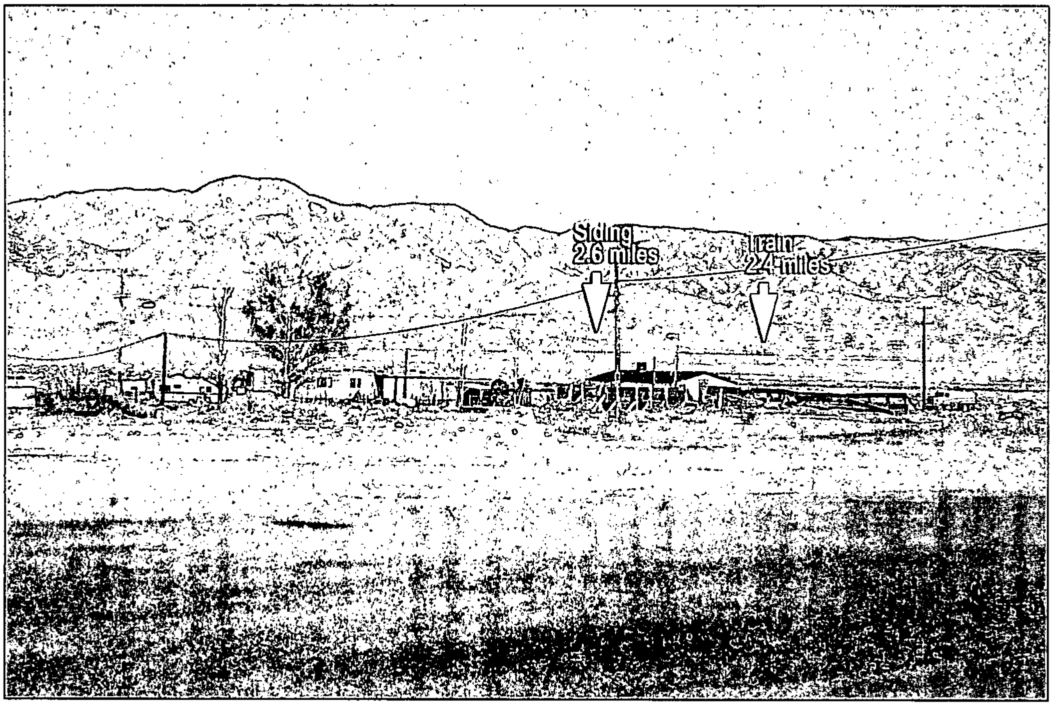


Figure D-105. Simulation of train and Gabbs Range quarry from key observation point M-9 in view east from Luning.

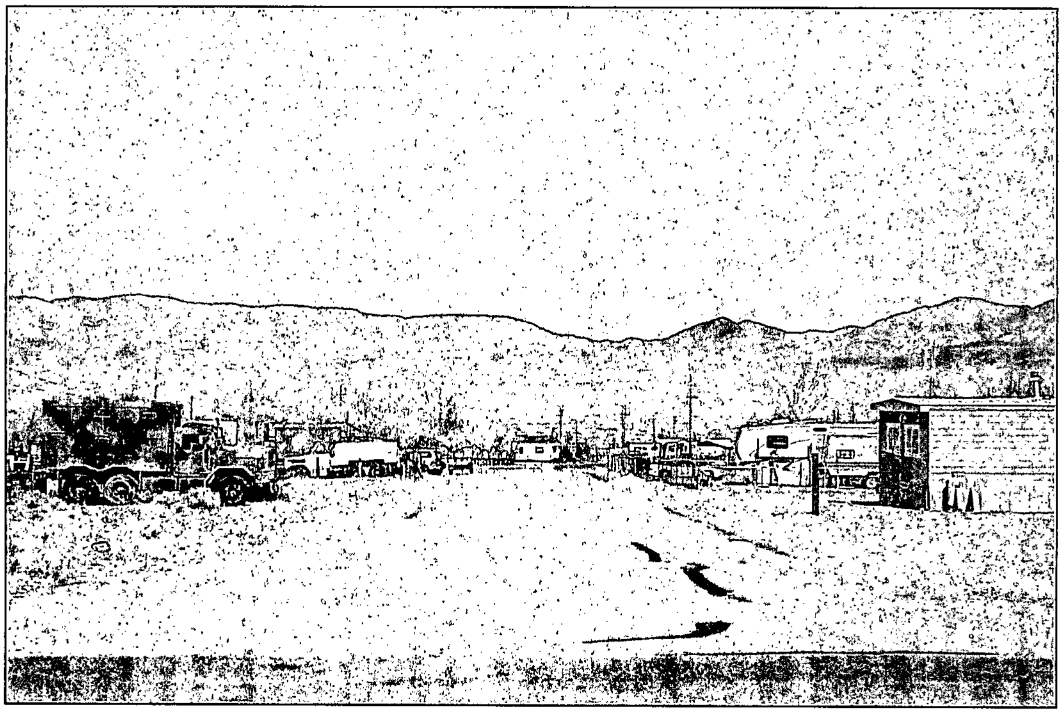


Figure D-106. View east from the town of Mina toward Mina common segment 1.

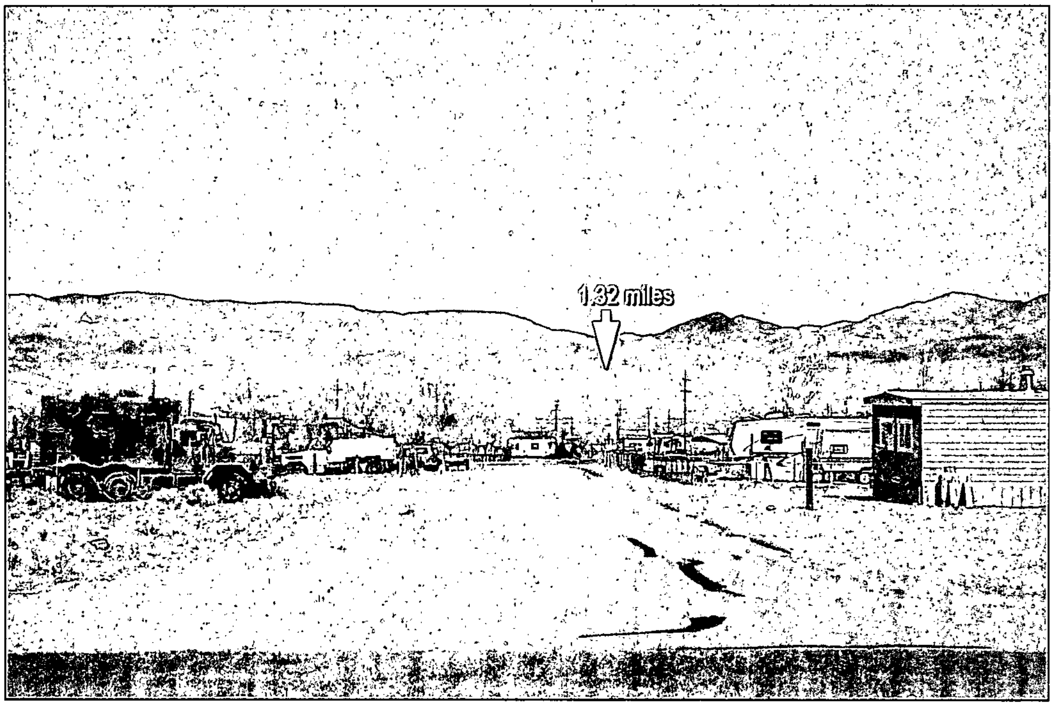


Figure D-107. Simulation of Mina common segment 1 in view east from key observation point M-10 at high point in the town of Mina.

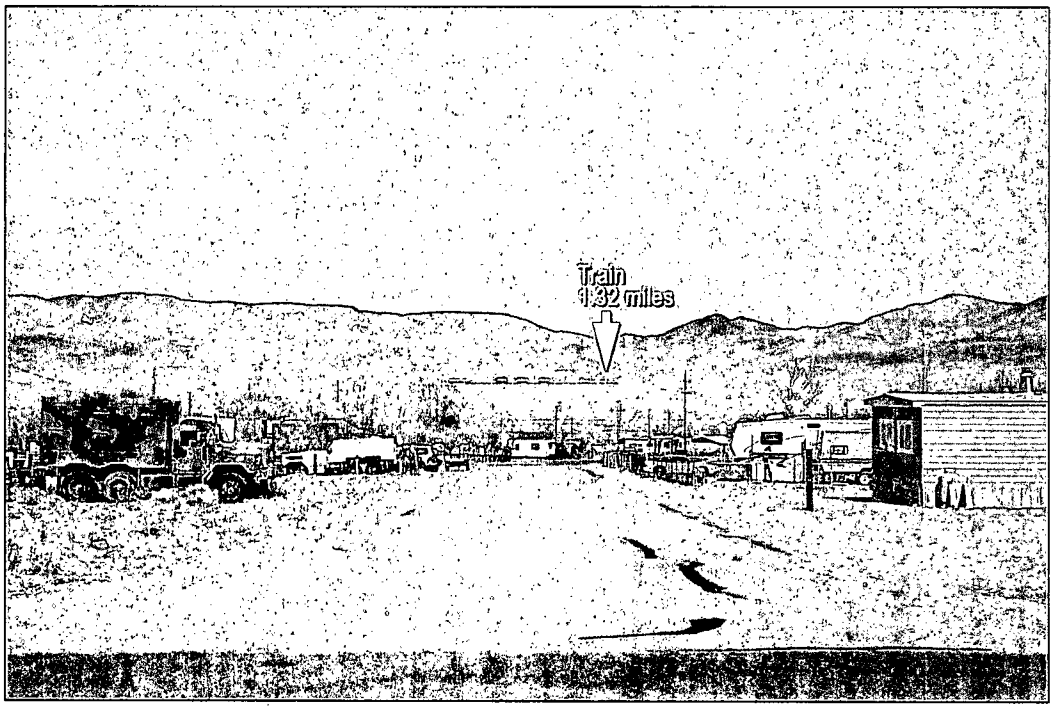


Figure D-108. Simulation of train on Mina common segment 1 in view east from key observation point M-10 at high point in the town of Mina.

Figure D-109. View from key observation point M-11 at intersection of State Route 265 and U.S. Highway 95 (Blair Junction) north to Mina common segment 1 toward Monte Cristo Range. The rail line would travel through the area in the foreground between the viewer and the hills.

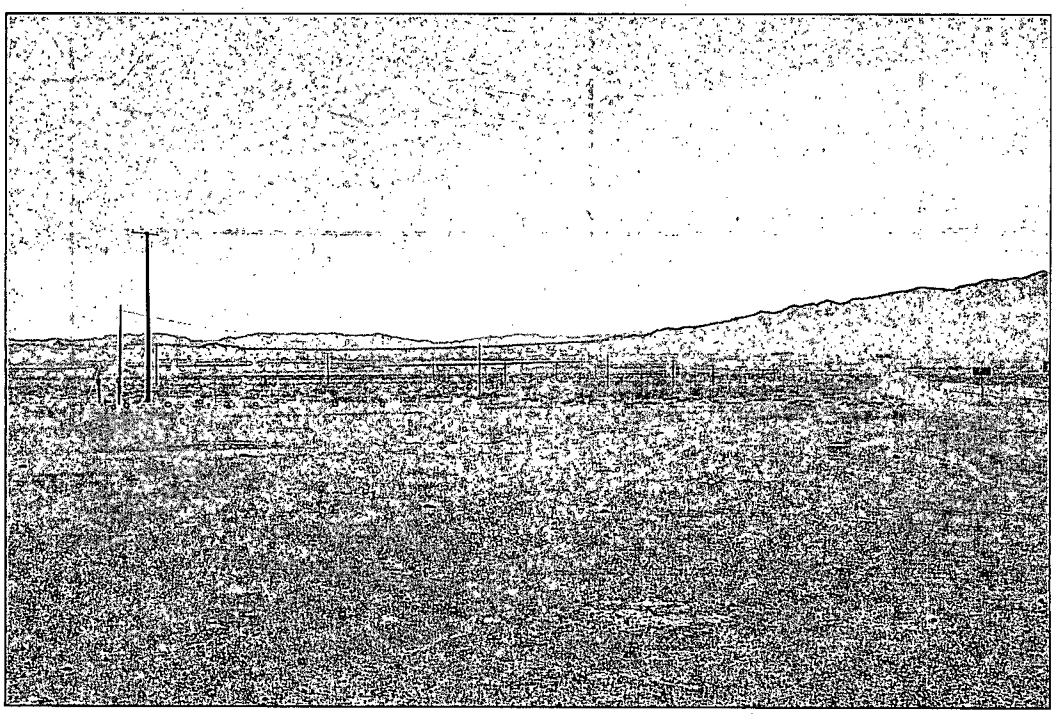


Figure D-110. View from key observation point M-11 at intersection of State Route 265 and U.S. Highway 95 (Blair Junction) south-southeast over State Route 265 to Montezuma alternative segment 1.

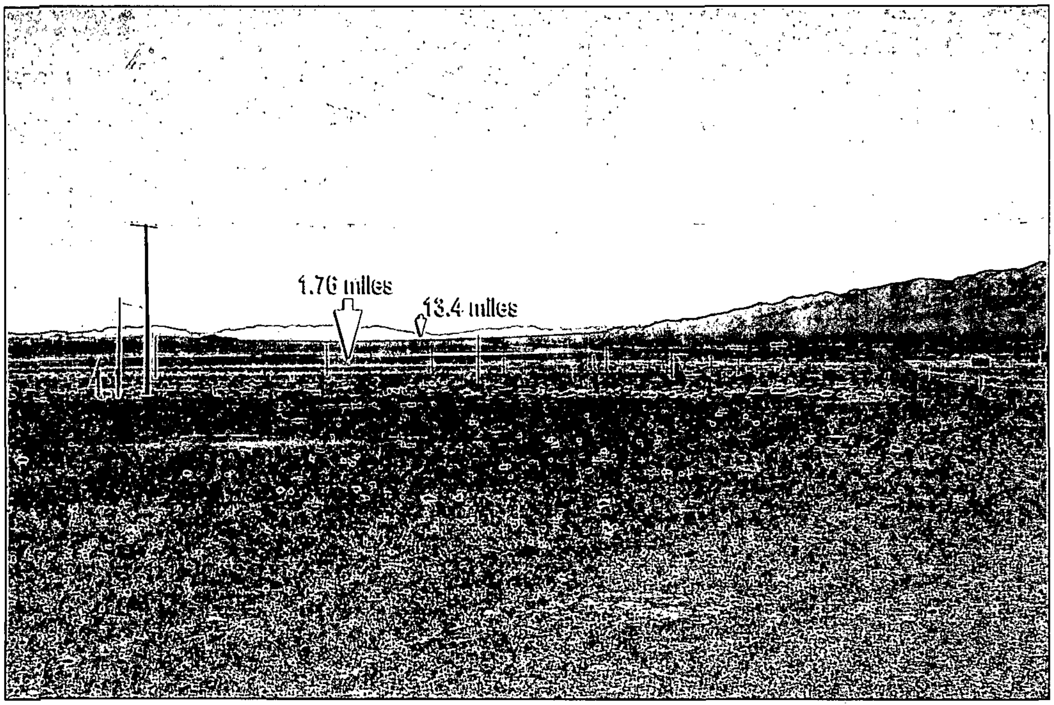


Figure D-111. Simulation of Montezuma alternative segment 1 running south along State Route 265 in view south-southeast from key observation point M-11 at Blair Junction.

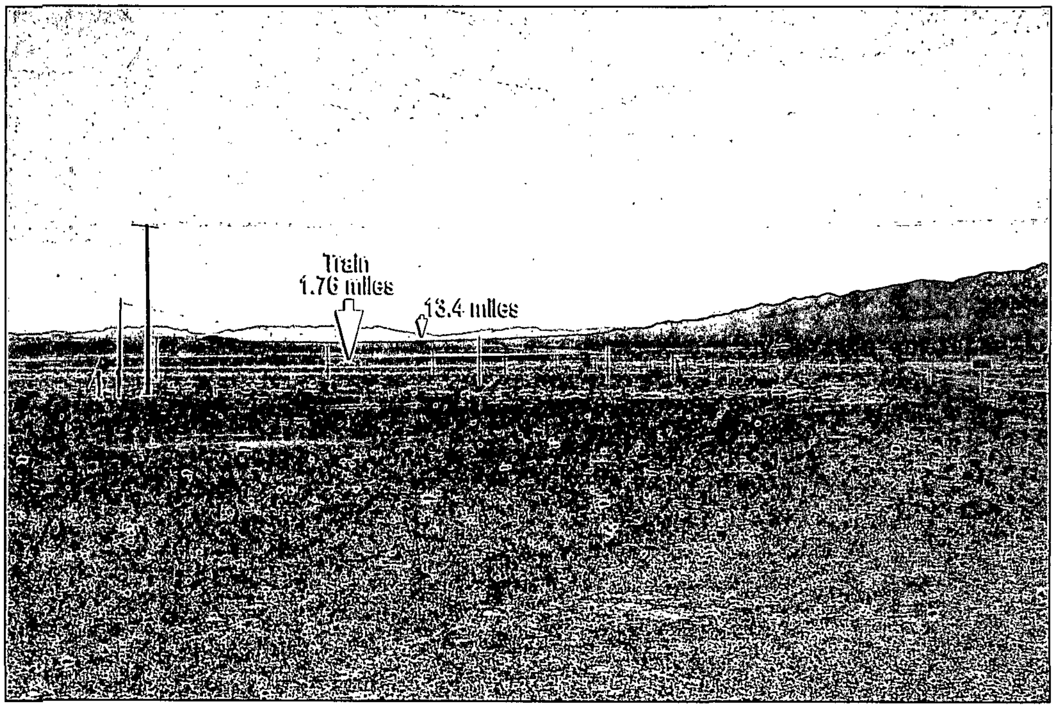


Figure D-112. Simulation of train on Montezuma alternative segment 1 running south along State Route 265 in view south-southeast from key observation point M-11 at Blair Junction.

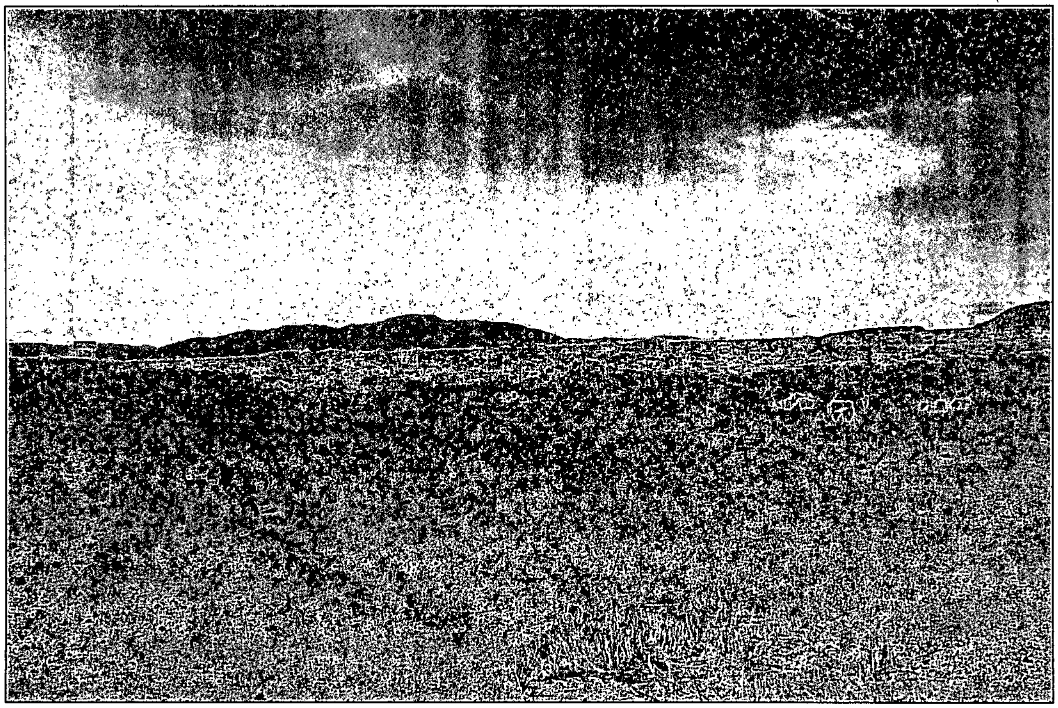


Figure D-113. View from key observation point M-11 at intersection of State Route 265 and U.S. Highway 95 (Blair Junction) west over Mina common segment 1.

Figure D-114. View south from key observation point M-12 on U.S. Highway 95 in Montezuma Valley toward location of Montezuma alternative segments 2 and 3 and Lone Mountain. Either segment would be in the middleground and would follow an existing rail bed, thus causing little additional contrast.

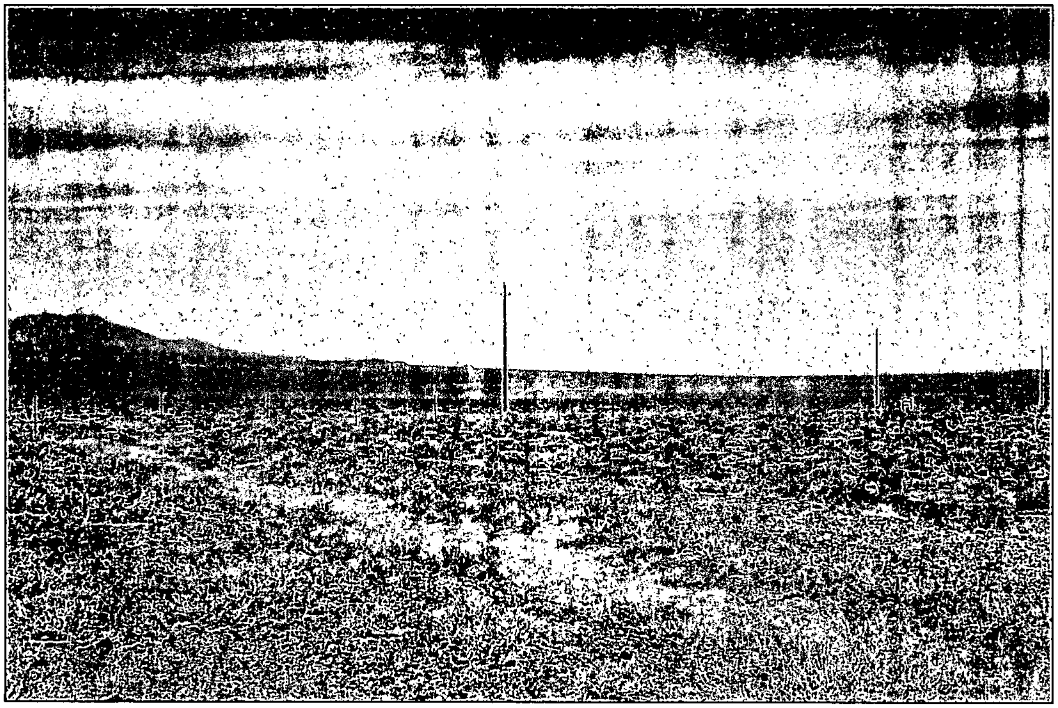


Figure D-115. View west from key observation point M-13 on U.S. Highway 95, toward location of Montezuma alternative segments 2 and 3 and proposed Maintenance-of-Way Facility at Klondike. A weak degree of contrast would result from the linear feature of the rail line in the foreground of the photo.

Figure D-116. View northeast from key observation point M-14 on Main Street in Silver Peak, south of the Chemetall Foote Corporation processing plant toward Montezuma alternative segment 1. The rail line would cross the white playa bottom in the middleground, and would be visible due to color discrepancy with the ballast material.

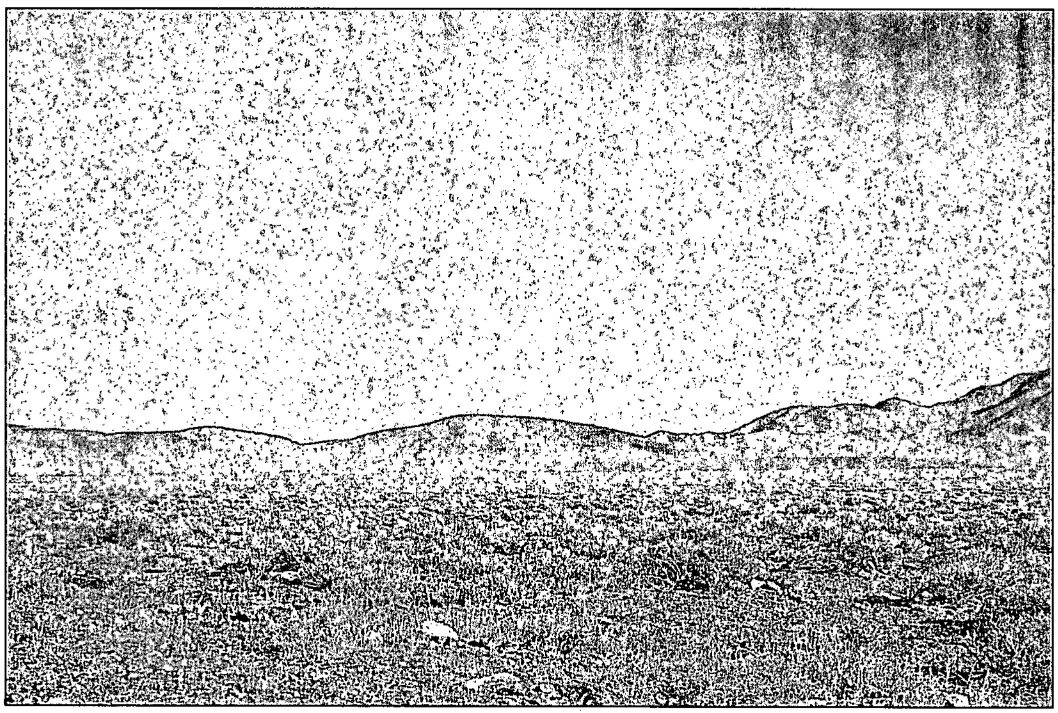


Figure D-117. View east from key observation point M-15 on Silver Peak Road toward location of Montezuma alternative segment 1 and North Clayton quarry.

Figure D-118. View northeast from key observation point M-16 on Silver Peak Road toward location of Montezuma alternative segments 2 and 3. Rail line would appear as a faint line in the background or would not be visible.

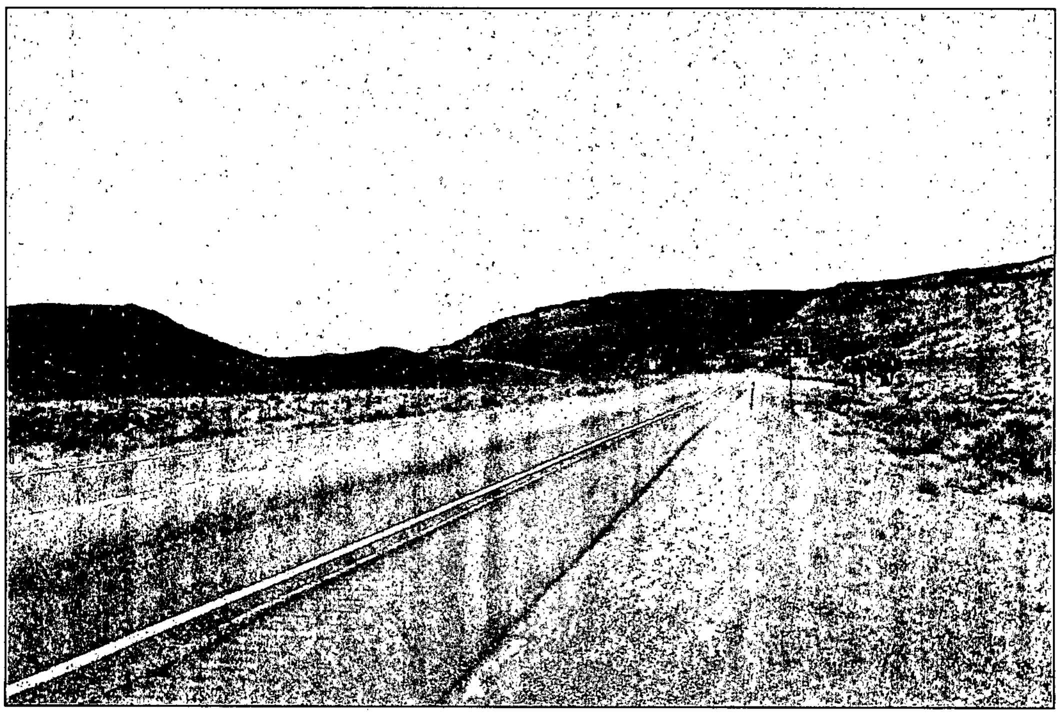


Figure D-119. View south-southeast from key observation point 31 on U.S. Highway 95 south of Goldfield.

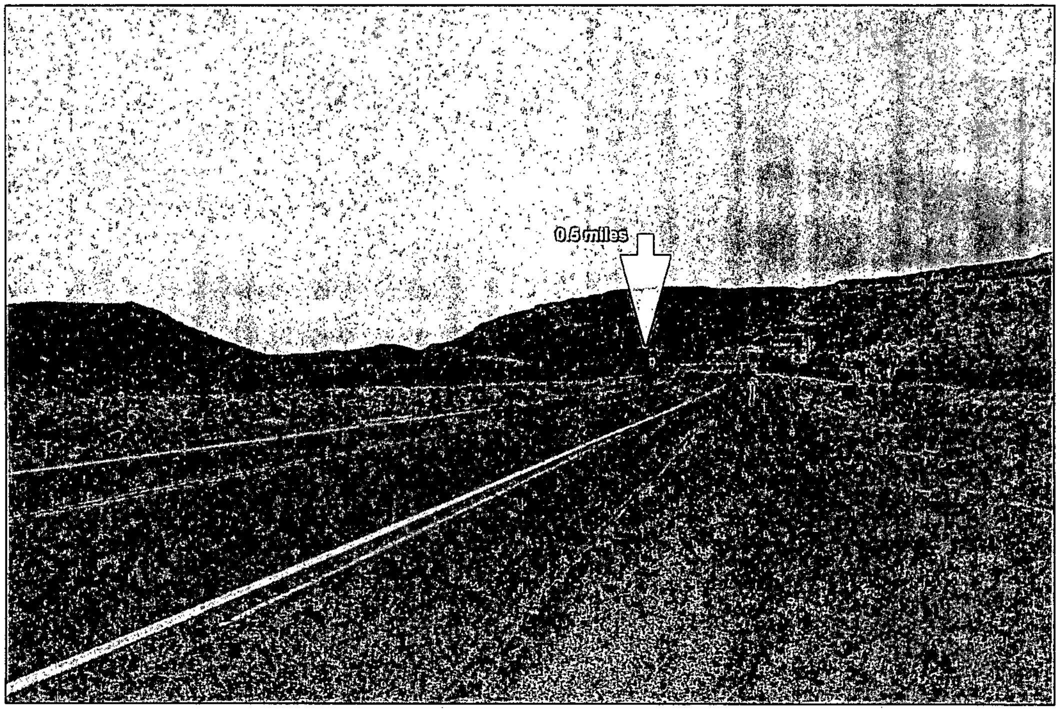


Figure D-120. Simulation of Montezuma alternative segment 2 crossing over U.S. Highway 95 in view south-southeast from key observation point 31.

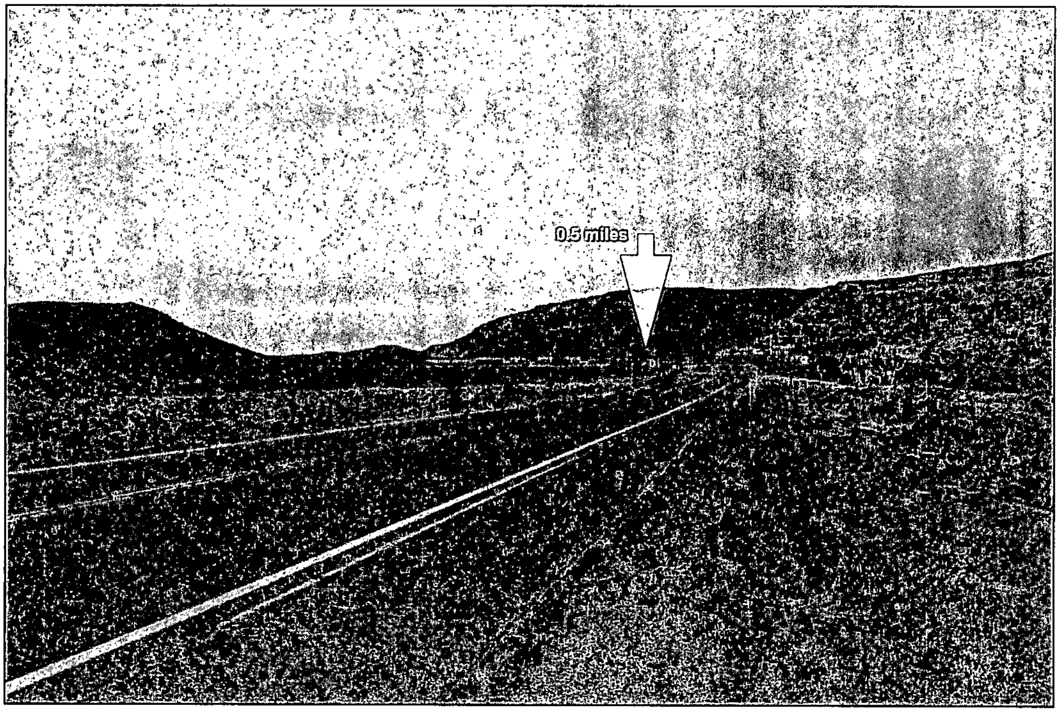


Figure D-121. Simulation of train on Montezuma alternative segment 2 in view south-southeast from key observation point 31.

Figure D-122. View east toward Stonewall Mountain from key observation point 32 on U.S. Highway 95 at intersection with State Route 266.

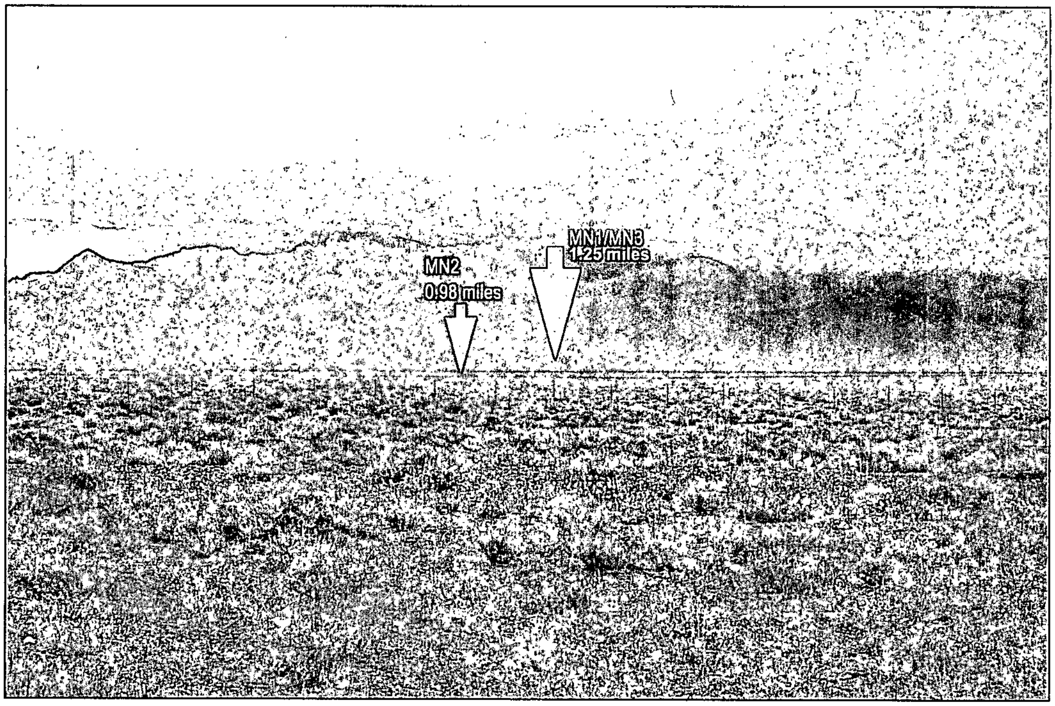


Figure D-123. Simulation of Montezuma alternative segments 1 and 3 (middleground) and Montezuma alternative segment 2 (foreground) in view east from key observation point 32. Stonewall Mountain in background.

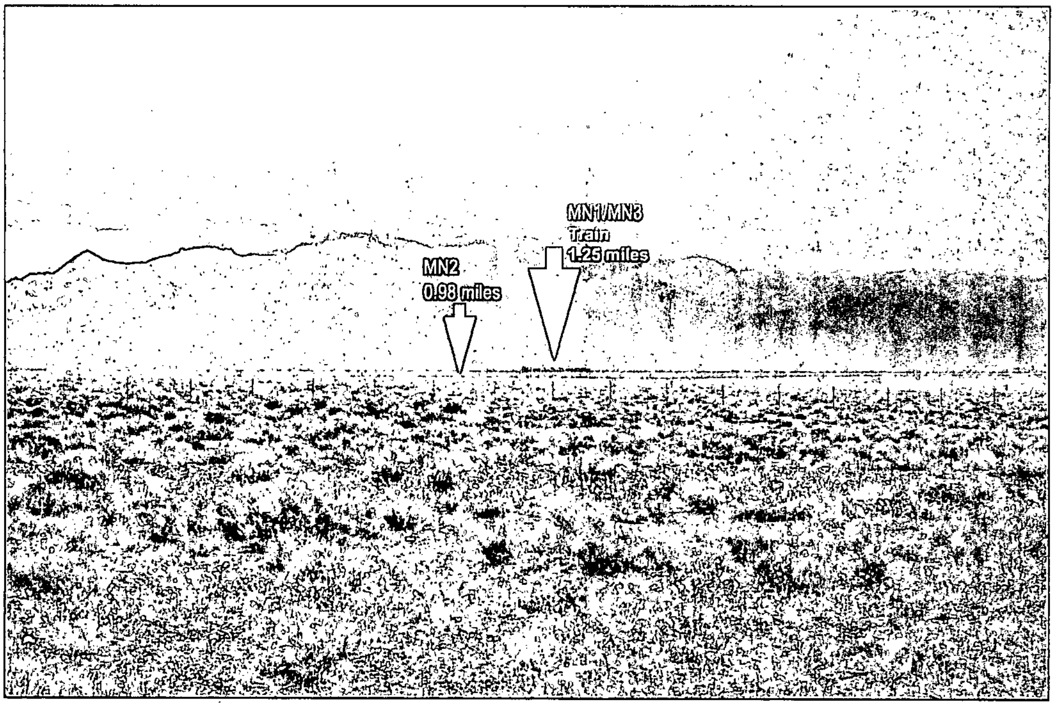


Figure D-124. Simulation of train on Montezuma alternative segments 1 and 3 (middleground) with Montezuma alternative segment 2 in foreground. View east from key observation point 32 with Stonewall Mountain in background.

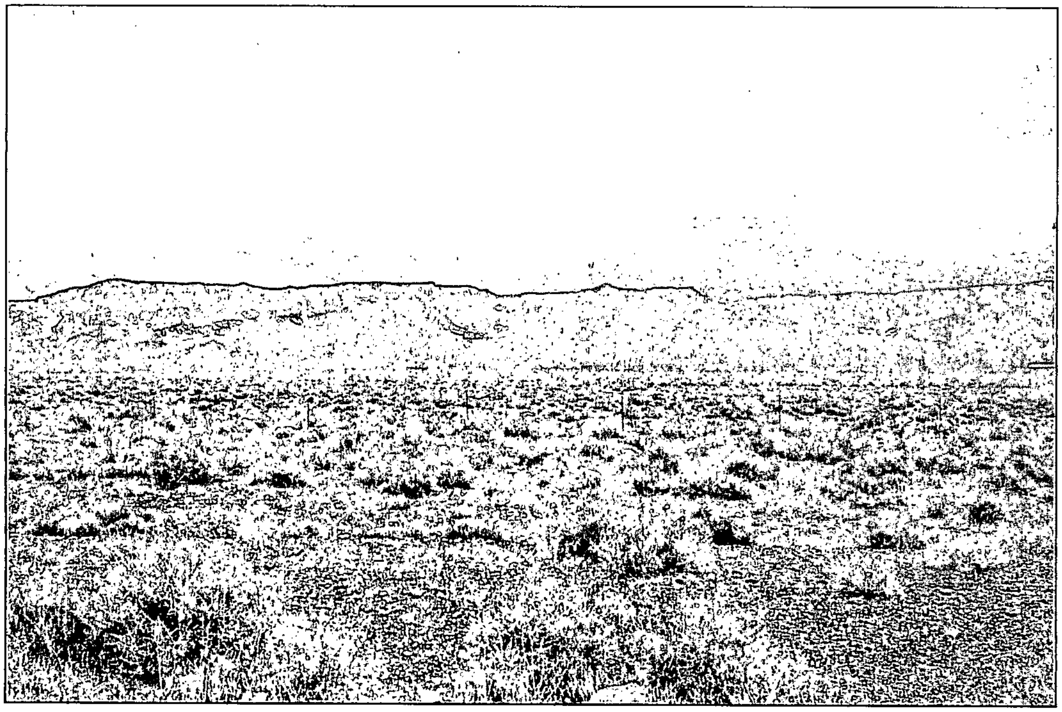


Figure D-125. View north-northeast from key observation point 33 on U.S. Highway 95 at intersection with State Route 267. Rail line would be several miles in the distance.

Figure D-126. View southeast from key observation point 34 on U.S. Highway 95. Cut would remove lower slope at far right to keep rail line on flat grade.

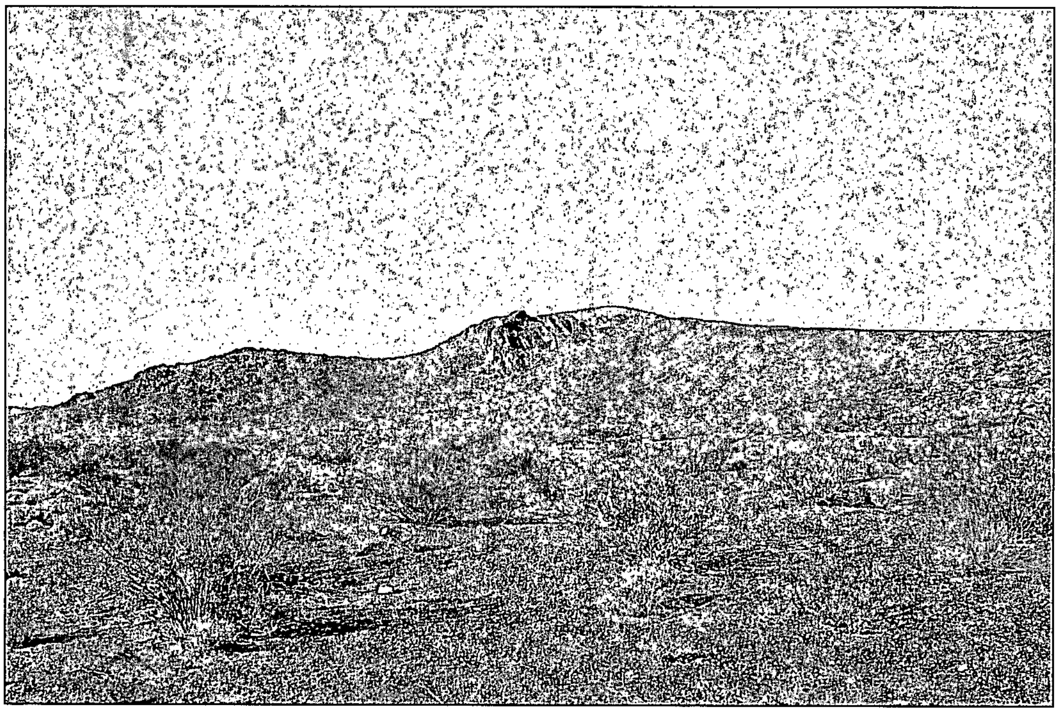


Figure D-127. View north from key observation point 34 on U.S. Highway 95 toward same cut location shown in Figure D-126. Cut would remove lower slope at far left to keep rail line on flat grade.

Figure D-128. View north-northeast from key observation point 35 on U.S. Highway 95 across a typical landscape. This most northerly of views from this point across the Amargosa River Valley toward Oasis Valley is where the rail line would be closest to the highway.

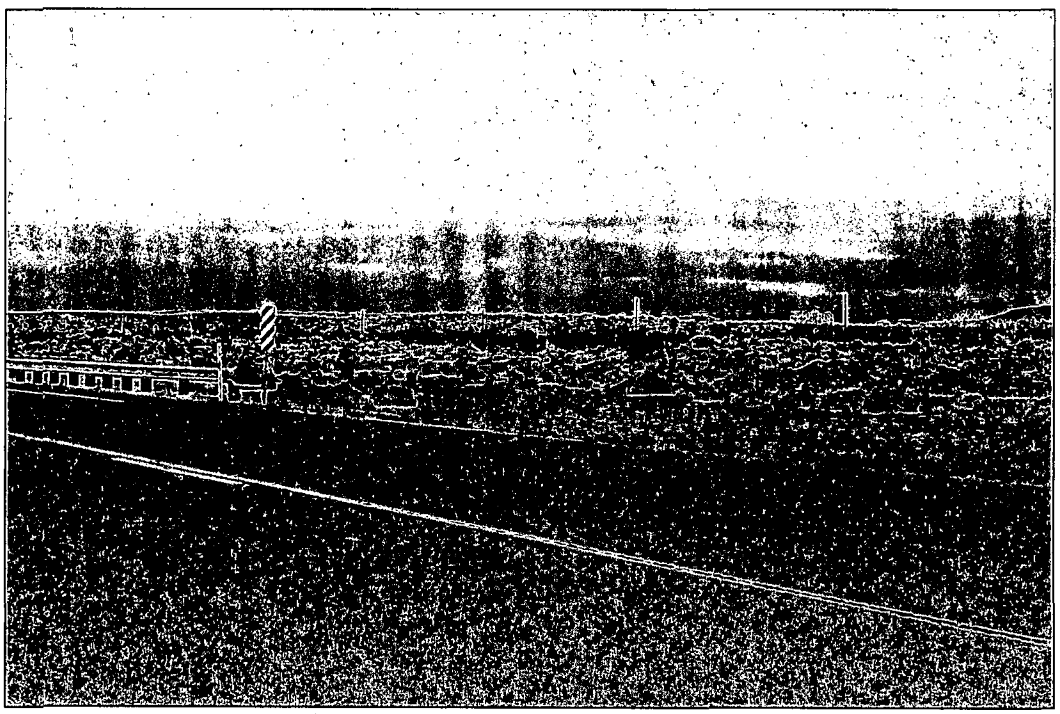


Figure D-129. View northeast from key observation point 36 on U.S. Highway 95 looking across the road that would be used for construction access to Beatty Wash. Rail line, bridge, and construction camp would not be visible from this point.

D.3 References

173052	BLM 1984	BLM (Bureau of Land Management) 1984. 8400 - Visual Resource Management, BLM Manual. [Washington, D.C.]: Bureau of Land Management. ACC: MOL.20050406.0039.
101505	BLM 1986	BLM (Bureau of Land Management) 1986. Visual Resource Inventory. BLM Manual Handbook 8410-1. Washington, D.C.: U.S. Bureau of Land Management. ACC: MOL.20010730.0378.
173053	BLM 1986	BLM (Bureau of Land Management) 1986. Visual Resource Contrast Rating, BLM Manual Handbook 8431-1. [Washington, D.C.]: Bureau of Land Management. ACC: MOL.20050406.0040.

APPENDIX E

AIR QUALITY ASSESSMENT METHODOLOGY

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

CO	carbon monoxide
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
PM_{10}	particulate matter with an aerodynamic diameter equal to or less than 10 micrometers
$PM_{2.5}$	particulate matter with an aerodynamic diameter equal to or less than 2.5 micrometers
SO_2	sulfur dioxide
VOCs	volatile organic compounds

APPENDIX E

AIR QUALITY ASSESSMENT METHODOLOGY

This appendix describes the methods DOE used to develop the assessments of potential impacts to air quality provided in Sections 4.2.4 and 4.3.4 of the Rail Alignment EIS.

Section **E.4** defines terms shown in ***bold italics***.

This appendix provides detail on the basis for:

- The air quality modeling methodology for construction and operation of the proposed railroad
- The emission inventory as used in the air quality modeling and for the county-level emission inventory comparison
- Site-specific details on the air quality modeling employed for each location where the U.S. Department of Energy (DOE or the Department) performed an assessment

Section E.1 is an overview of the air quality modeling methodology and assumptions; Section E.2 addresses the Caliente rail alignment; and Section E.3 addresses the Mina rail alignment.

E.1 Overview of Air Quality Modeling Methodology and Assumptions

This section describes the general approach DOE used to model potential impacts to existing ***ambient air*** quality that would result from emissions during railroad construction and operations along the Caliente rail alignment or the Mina rail alignment.

Air quality is generally a regional issue, and compliance with federal and state air quality standards is most often determined at the county level. Historic data on pollutant emissions inventories and compliance status for the State of Nevada are calculated at the county level, and these provide the best means of comparison to the potential impacts from proposed railroad construction and operations. Therefore, the air quality assessment considered impacts associated with increases in total emissions levels and compliance with regulatory standards at the county level.

However, stationary point sources (such as quarries) and mobile sources of air emissions (such as operating trains and automobiles) can subject certain locations, such as population centers (known as receptors), to higher localized levels of pollutants than a regional analysis would suggest. Therefore, DOE also selected more focused study locations within the region of influence in which to model air quality impacts to specific receptors. The Department modeled potential impacts to air quality using the U.S. Environmental Protection Agency (EPA) ***AERMOD*** Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all). Model inputs included (1) the estimated air pollutant emissions rates that would be produced by railroad construction and operations activities and (2) local meteorology, where appropriate.

DOE modeled a set of scenarios for the Caliente rail alignment and a set for the Mina rail alignment, in which each combination of location and activity represents one scenario. Generally, the methodology employed to determine potential impacts from air emissions for a scenario involved the following steps:

1. Determine the appropriate air pollutant emissions rates from all facilities in question at the given location.

2. Set up the modeling scenarios in AERMOD to accurately represent the expected layout of emissions sources and position receptors to capture the maximum expected impact from the scenario, including terrain effects on concentration.
3. Obtain at least 3 years of appropriate meteorological inputs for the modeling scenario.
4. Run the model for 3-year periods for the given scenario with unit values (1 gram per second) for emission rates from all sources.
5. Post-process the model output to adjust the unit emission rates for the actual emission rates for each pollutant from each source and determine peak concentrations for all air pollutants of concern and for all averaging periods.
6. Combine the peak and background concentrations and compare them with the applicable ***National Ambient Air Quality Standards*** (NAAQS) to determine if the scenario would have the potential to exceed the NAAQS.

DOE based the air quality modeling effort on the following:

- Emissions from all construction activities involving surface disturbance, laying track, and other processes would have a release height of 0.5 meter (1.6 feet), representing a typical exhaust height, with a initial vertical dimension of 0.46 meter (1.5 feet) to reflect surface or near-surface releases. Emissions from locomotives would have a release height of 5 meters (16 feet) (DIRS 173568-California Environmental Protection Agency 2004, Appendix G) with an initial vertical dimension of 2.3 meters (7.5 feet).
- DOE modeled construction and operations activities along the rail line and rail sidings as volume sources because those emissions would have both a horizontal and a vertical dimension associated with the train stacks and buoyant plumes. Modeling the highly linear rail line as a volume source best represents the initial shape of the plume. The Department modeled activities during quarry operations as area sources to maximize flexibility in source shape and orientation.
- DOE determined maximum air pollutant concentrations near construction and operations activities. The Department set the distance between each activity and the closest receptors on both sides of the edge of the construction right-of-way during the construction phase and on both sides of the edge of the operations right-of-way during the operations phase. The spacing between receptors averaged 25 meters along the right-of-way. All receptors were set at a standard breathing height of 1.8 meters (5.9 feet) above ground level.
- For purposes of modeling, DOE took the layout of each facility for the Caliente rail alignment from *Facilities–Design Analysis Report Caliente Rail Corridor, Task 10: Facilities, Rev. 01* (DIRS 176168-Nevada Rail Partners 2006, all).
- For purposes of modeling, DOE took the layout of each facility for the Mina rail alignment from *Facilities–Design Analysis Report Mina Rail Corridor, Task 10: Facilities, Rev. 00* (DIRS 180873-Nevada Rail Partners 2007, pp. 3-1 and 3-2).
- Construction activity along the rail alignment and at all facilities would occur for 12 hours per day, 5 days each week for the duration of each activity.
- During the construction phase, quarries would operate evenly over a 250-day per year schedule (average of 5 days per week), 12 hours per day each week. DOE set receptor locations at the quarry fence line (DIRS 175945-Nevada Rail Partners 2005, pp. 3-7 and 3-8; DIRS 176182-Shannon & Wilson 2006, pp. 15 and 33). Spacing between receptors averaged 50 meters along the fence line.
- DOE determined air pollutant concentrations at all receptors for each scenario using the AERMOD dispersion modeling system version 07026 (DIRS 174202-EPA 2002, DIRS 181091-EPA 2004, all;

DIRS 181090-EPA 2007, all). This software is currently the EPA-recommended model for regulatory applications and is appropriate for this application. Meteorological and terrain inputs for AERMOD were prepared with the ***AERMET*** and ***AERMAP*** preprocessors, respectively. Both employ version 06341.

- DOE aggregated the concentration values from each air pollutant source in each scenario and adjusted from unit to actual emission rates. Generally, this procedure operated by reading the individual model output files for each source group in each scenario, summing the contribution from each source group at each receptor and outputting the receptor exhibiting the peak concentration of each air pollutant.
- DOE computed maximum concentrations (along with maximum background concentration) for all sources in each scenario for all ***criteria air pollutants*** and compared these maximums to the Nevada and National Ambient Air Quality Standards.

E.2 Caliente Rail Alignment

The Caliente rail alignment region of influence for air quality and climate consists of the air basins in three counties (Lincoln, Nye, and Esmeralda) in Nevada through which the rail line would run. DOE performed air quality modeling in four locations: the two largest population centers near the Caliente rail alignment (Caliente in Lincoln County and Goldfield in Esmeralda County), and quarry sites northwest of Caliente (CA-8B) and in South Reveille Valley (NN-9B).

For the Caliente rail alignment, the Department modeled a total of eight scenarios, as listed in Table E-1.

Table E-1. Air quality modeling scenarios for railroad construction and operations along the Caliente rail alignment.

Scenario	Activity	Location
1	Rail line construction	Near the City of Caliente (Lincoln County)
2	Facility construction	Interchange Yard in Caliente
3	Rail line construction and quarry operations	Potential quarry site CA-8B northwest of Caliente
4	Rail line construction and quarry operations	Potential quarry site NN-9B in South Reveille Valley (Nye County)
5	Rail line construction	Near Goldfield (Esmeralda County)
6	Railroad operations	Near Caliente
7	Facility operations	Interchange Yard in Caliente
8	Railroad operations	Near Goldfield

E.2.1 CONSTRUCTION IMPACT ASSESSMENT – CALIENTE RAIL ALIGNMENT

E.2.1.1 Overview

DOE assumed a total duration of the construction phase to be the shortest under consideration (4 years), with 36 months of construction and the remaining 12 months allocated to installation, testing of signal and communications equipment, and commissioning. This assumption produced conservative (high) emission estimates, because longer periods of construction would result in lower annual emission rates.

The construction impact assessment included emissions and impacts to air quality associated with the construction of the rail line, access roads, wells, quarries, construction camps, and construction-material storage piles. *Construction Plan Caliente Rail Corridor, Task 14: Construction Planning Support, Rev. 01* (DIRS 176172-Nevada Rail Partners 2006, all) provides more detail on construction and associated emissions.

The construction impact assessment also included emissions and air quality impacts associated with the construction of the Interchange Yard at the Interface with the Union Pacific Railroad Mainline in Lincoln County, which DOE expects would occur during the first year of the rail line construction phase. Details on the activity and emissions at this facility were taken from the *Air Quality Emission Factors and Socio-Economic Model Input Caliente Rail Corridor, Task 13: EIS Interface Support, Rev. 01* (DIRS 180921-Nevada Rail Partners 2007, all) (the Caliente Rail Corridor Task 13 document).

E.2.1.1.1 Exhaust Emissions

DOE based the estimated exhaust emissions associated with construction of the proposed railroad along the Caliente rail alignment on engineering estimates of activity levels for construction crews operating in either rugged or gentle terrain. The Department assumed the use of similar construction equipment in both types of terrain, but assumed that the duration of activities would be longer in rugged terrain. Rugged terrain would require significant cut-and-fill operations.

DOE estimated exhaust emissions consisting of ***nitrogen oxides*** (NO_x), ***particulate matter*** with aerodynamic diameters equal to or less than 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$), ***sulfur dioxide*** (SO_2), ***carbon monoxide*** (CO), and ***volatile organic compounds*** (VOCs) from both non-road and on-road equipment. Non-road equipment would include bulldozers, graders, front-end and backhoe loaders, excavators, scrapers, cranes, compactors, tampers, drills, and other equipment. On-road equipment would include equipment licensed for on-road use that would be used for construction of the proposed railroad (such as pickup, dump, and water trucks).

To determine annual non-road equipment exhaust emissions, DOE used engineering estimates of equipment size, activity levels, annual hours of operation, and horsepower ratings for the construction equipment as reported in the Caliente Rail Corridor Task 13 document. This document included in its analysis an adjustment to operating hours for the cut-and-fill operations. Activity hours for locations assessed as needing considerable cut and fill operations were increased by 50 percent. Emissions factors for corresponding classes of non-road equipment used in construction were conservatively estimated from EPA Tier 1 (typically, 1997 to 2003 model-year equipment) emissions standards based on horsepower ratings from *Exhaust and Crankcase Emissions Factors for Non-road Engine Modeling—Compression-Ignition* (DIRS 174089-EPA 2004, all). Exhaust emissions of NO_x were conservatively converted to ***nitrogen dioxide*** (NO_2) at the rate of 20 percent.

To determine exhaust emissions from on-road equipment, annual operating hours from the Caliente Rail Corridor Task 13 document (DIRS 180921-Nevada Rail Partners 2007, all) were converted to annual miles traveled assuming average operating speeds of 24 kilometers (15 miles) per hour and combined with emissions factors for appropriate vehicle classifications from the EPA MOBILE 6.2 vehicle emission modeling software (DIRS 174201-EPA 2003, all; DIRS 181954-EPA 2007, all; DIRS 181955-EPA 2004, all).

E.2.1.1.2 Fugitive Dust Emissions

DOE estimated particulate-matter emissions from ***fugitive dust*** associated with construction activities along the Caliente rail alignment based on the calculations in the Caliente Rail Corridor Task 13 document (DIRS 180921-Nevada Rail Partners 2007, all). These calculations are based on EPA emission factor guidance from *AP-42, Compilation of Air Pollutant Emission Factors* (DIRS 103679-EPA 1991, Section 13.2.3) and the *WRAP Fugitive Dust Handbook* (DIRS 174081-Countess 2004, Chapters 3, 6, and 9). DOE estimated fugitive dust emissions for soil disturbance from grading, scraping, bulldozing, and other rail line construction activities; wind erosion; construction material stockpiles; construction and operation of concrete batch plants; construction camps; rail line facilities; quarry and excavation activities; and construction of new access roads or upgrades of unpaved roads.

The rail line construction right-of-way would be nominally 150 meters (500 feet) on either side of the centerline of the rail alignment (300 meters [1,000 feet] total width). In addition, the Caliente rail alignment would include:

- Two major bridges (over Beatty Wash and the White River) and a series of minor bridges.
- Twelve construction camps 0.1 square kilometer (25 acres) each.
- Sites for four railroad operations support facilities (the Interchange Yard, Staging Yard, Maintenance-of-Way Trackside Facility, and Rail Equipment Maintenance Yard) that would occupy 0.06 square kilometer, 0.2 square kilometer, 0.06 square kilometer, and 0.4 square kilometer (15, 50, 15, and 100 acres), respectively.
- A total of 23 kilometers (14 miles) of access roads to facilities, plus the access roads on either side of the rail line.
- Four hundred storage piles to be used in track construction that would be located along the rail route.

Fugitive dust emissions would also be associated with the operation of batch plants (including two coarse and fine storage piles), with new road construction or upgrades, and with quarry and excavation operations. In addition to the rail roadbed construction activity, a substantial amount of fugitive dust emissions would be related to haul trucks in the construction zone.

DOE would ensure that best management practices were implemented during construction to minimize air emissions of particulates. These measures typically would include the application of water or other dust suppressants on disturbed land, and limiting vehicle speeds on all unpaved roads. The EPA provides guidance on estimating emissions, including emissions in specific size ranges and information on watering as a dust-control method for unpaved roads (*WRAP Fugitive Dust Handbook* [DIRS 174081-Countess 2004, pp. 3-13 and 3-14] and in AP-42, Section 13.2.2 [DIRS 103679-EPA 1991, all]). The handbook provides additional guidance on the effectiveness of water in suppressing fugitive dust during construction. Emissions-control efficiency ranges from approximately 40 to 85 percent for short durations (DIRS 174084-Piechota et al. 2002, all), depending on meteorology, soil water content, soil type, and other factors. Typical effectiveness values of 70 percent are characteristic of the southwestern

United States (DIRS 174215-Maricopa County 2004) for applications on the order of hours. For realistic estimation of fugitive dust emissions, DOE assumed:

- A 74-percent best management practice reduction for most fugitive dust emission sources (DIRS 174081-Countess 2004, Executive Summary, pp. 3 and 3-14)

Based on operational guidance, DOE assumed all of the following:

- An 84-percent reduction for construction material storage piles (DIRS 174081-Countess 2004, Executive Summary, p. 3)
- A 62-percent reduction for batch plant operations (DIRS 174081-Countess 2004, Table 4-2, p. 4-5)
- A 70-percent reduction for quarry operations (DIRS 174081-Countess 2004, Executive Summary, p. 3)

E.2.1.2 Lincoln County Detail

E.2.1.2.1 Emissions Inventory

DOE based the total emissions expected to occur within Lincoln County from rail line construction along the Caliente rail alignment on the anticipated rail alignment options (common segments and alternative segments) through the county, which range from approximately 132 kilometers (82 miles) to approximately 148 kilometers (92 miles), depending on the route chosen. Lincoln County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, well construction, and construction-material storage piles. Emissions from construction activities that would occur only in Lincoln County (for example, construction of the Interchange Yard, specific access roads, and one quarry) were allocated solely to Lincoln County. DOE estimated annual exhaust and fugitive dust emissions of VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ that would be attributable to rail line construction activities in Lincoln County, including construction of the Interchange Yard, for each of the assumed 4 years of construction. The Department determined the highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase. The analysis compares construction-related emissions with 2002 Lincoln County data on annual pollutant emissions obtained from the EPA National Emission Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.2.1.2.2 Air Quality Modeling

E.2.1.2.2.1 Construction Activity. DOE modeled air quality to determine how construction activities would be likely to impact air pollutant concentrations at Caliente. Modeling included both the rail line and the Interchange Yard. The Department used the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all) for all model runs.

Caliente meteorological data were provided primarily by the Desert Research Institute-operated Community Environmental Monitoring Program. For missing hours in this record, DOE substituted data from the Pioche Community Environment Monitoring Program site (obtained from the Desert Research Institute) and cloud-cover data from McCarran International Airport in Las Vegas. This surface meteorological data represents the best available information for this region, for which meteorological data are sparse. Upper-air data were taken from Elko, Nevada (National Weather Service station 72582). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Elko is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record for 1999, 2000, and 2001 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

In all cases, emission rates were expressed in units of grams per second for the appropriate activity and the resulting highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at all receptors were determined for each model year.

DOE modeled the construction of a portion of the Caliente alternative segment that would begin near Caliente and extend to the northwest for 2 kilometers (1.3 miles) through an area of private property near the city. DOE chose this location for the modeling runs because it represents the closest location of the Caliente rail alignment to population centers.

Because the Department would use existing rail line, construction emissions modeled included only the emissions from the use of locomotives to deliver ballast to subsequent portions of the rail line under construction once the initial rail had been laid. This modeling used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). DOE assumed rail line construction would occur at a rate of 260 hours per month (nominally12 hours per day, 5 days per week). The peak result from the model runs was used to determine all averaging periods.

DOE also modeled emissions from construction of the proposed 0.06-square-kilometer (15-acre) Interchange Yard in Caliente. DOE set receptor locations surrounding the proposed Interchange Yard along the public roads that would parallel the Yard. Receptors were set at a standard breathing height of 1.8 meters (5.9 feet) and a release height of 0.5 meter (1.6 feet) was employed to reflect near surface releases from equipment and dust. Construction activities would include surface work, laying track, and building structures for the Interchange Yard. DOE assumed construction of the Interchange Yard would occur at an average rate of 260 hours per month (nominally 12 hours per day, 5 days per week).

E.2.1.2.2.2 Quarry Activity. DOE also performed air quality modeling to estimate air pollutant concentrations resulting from activity at potential quarry site CA-8B northwest of the City of Caliente (DIRS 175945-Nevada Rail Partners 2005, all). All modeling was performed using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

Caliente meteorological data was provided primarily by the Desert Research Institute-operated Community Environmental Monitoring Program. For missing hours in this record, DOE substituted data from the Pioche Community Environment Monitoring Program site (obtained from the Desert Research Institute) and cloud-cover data from McCarran International Airport in Las Vegas. This surface meteorological data represents the best available information for this region, for which meteorological data are sparse. Upper-air data were taken from Elko, Nevada (National Weather Service station 72582). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Elko is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record for 1999, 2000, and 2001 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

DOE calculated emissions for each of the assumed 3 years of quarry operation, including emissions associated with construction of the quarry facilities during the first year of the construction phase. Emissions included those from the quarry, plant, railroad siding, and access roads. All sources were taken as surface-based releases. Annual emissions were distributed evenly over a 250-day-per-year work schedule (average of 5 days per week), operating between 6:00 a.m. and 6:00 p.m. Receptor locations were set at the fence line surrounding the potential quarry and at a standard breathing height of 1.8 meters (5.9 feet).

Next DOE determined the highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations of each air pollutant at all receptors over all 3 years of meteorological data. Therefore, the analysis approach represents a conservative estimate of air pollutant concentrations.

E.2.1.3 Nye County Detail

E.2.1.3.1 Emissions Inventory

The total emissions expected to occur within Nye County from construction of the proposed rail line along the Caliente rail alignment was based on the proposed rail alignment options (common segments and alternative segments) through the county, which range from 342 kilometers (213 miles) to 398 kilometers (247 miles). Nye County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, well construction, and construction material storage piles. Emissions from construction activities that would occur only in Nye County (for example, the Maintenance-of-Way Trackside Facility and construction and operation of one quarry and facility access roads) were allocated solely to Nye County. DOE estimated exhaust and fugitive dust emissions that would be attributable to rail line construction and associated facility construction activity in Nye County for each of the assumed 4 years of construction. The highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase were used in subsequent analysis.

E.2.1.3.2 Air Quality Modeling

E.2.1.3.2.1 Quarry Activity. DOE also performed modeling to determine potential impacts to air quality associated with construction-related activity at proposed quarry site NN-9B in South Reveille Valley (DIRS 175945-Nevada Rail Partners 2005, Appendix B, pp. B-11, B-12, and B-34 through B-37). All model runs were made using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090 - EPA 2007, all).

For surface meteorological data, DOE relied primarily on the nearby Tonopah Nevada National Weather Service site because of the availability of complete hourly weather data, including cloud-cover data. DOE also used matching upper-air meteorological data from the National Weather Service Mercury/Desert Rock site as model input. DOE was able to assemble a complete 4-year meteorological record for 1989, 1990, 1991, and 1992 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

DOE calculated air pollutant emissions for each of the assumed 3 years of quarry operation associated with construction of the rail line, which included emissions associated with the construction of the quarry facilities during the first year of the construction phase. DOE then modeled the peak annual emissions from activity inside the facility, including the quarry, plant, railroad siding, and access road as area sources. All sources were taken as surface-based releases. Annual emissions were distributed evenly over a 250-day-per-year work schedule (average of 5 days per week), operating between 6:00 a.m. and 6:00 p.m. Receptor locations were set at the fence line surrounding the potential quarry and at a standard breathing height of 1.8 meters (5.9 feet).

DOE determined the highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations of each air pollutant at all receptors over all 4 years of meteorological data. Therefore, the analysis approach represents a conservative estimate of air pollutant concentrations.

E.2.1.4 Esmeralda County Detail

E.2.1.4.1 Emissions Inventory

The total emissions expected to occur within Esmeralda County from rail line construction along the Caliente rail alignment are based on the anticipated rail alignment options (common segments and alternative segments) through the county, which range from 22 kilometers (14 miles) to 44 kilometers (27 miles). Esmeralda County was allocated the fraction of total emissions that would result from rail line construction, alignment access-road construction, well construction, and construction-material storage piles. DOE estimated exhaust and fugitive dust emissions that would be attributable to rail line construction and associated facility construction activity in Esmeralda County for each of the assumed 4 years of construction. The highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase were determined.

E.2.1.4.2 Air Quality Modeling

DOE modeled air quality to determine the impact of emissions from construction of a segment of the rail alignment (Goldfield alternative segment 4; see Figure 2-9 in Chapter 2 of this Rail Alignment EIS) passing near Goldfield extending for 4.7 kilometers (2.9 miles) near the town. DOE selected Goldfield alternative segment 4 as the most conservative alignment in relation to proximity to population and the exposure to emissions from construction of the rail line. All modeling runs were made using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE used surface meteorological data from the Tonopah Nevada National Weather Service site in the analysis because of the complete hourly weather data, including cloud-cover data. DOE used matching upper-air meteorological data from the National Weather Service Mercury/Desert Rock site in the modeling effort. DOE was able to assemble a 4-year meteorological record for 1989, 1990, 1991, and 1992 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

In all cases, an appropriate emissions rate was determined with units of grams per second or grams per second per square meter for the appropriate activity, and the resulting highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at all receptors were determined for each model year. In addition to the receptors placed alongside the construction and permanent operation rights-of-way, DOE also placed five key receptors at locations within Goldfield. These include the tanks west of Goldfield alternative segment 4, the School Bus Maintenance Facility east of the alignment, and three houses east of the alignment at the periphery of the town nearest the alignment. DOE determined pollutant concentrations at each of these locations in addition to those at the rights-of-ways to indicate potential project impact at key locations in addition to the overall maximum impact at any location along the modeling domain.

DOE modeled construction emissions in two phases. The first phase modeled the emissions associated with construction activities, including surface disturbance, laying track, and other processes with a release height of 0.5 meter (1.6 feet) to reflect surface or near-surface releases from equipment activity. This represented the initial portion of rail line construction. For the second modeling phase, DOE modeled the emissions from the use of locomotives to deliver ballast to subsequent portions of the rail line under construction once the initial rail had been laid. This modeling used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). For both model runs, DOE assumed rail line construction would occur at a rate of 260 hours per month. The highest year results from the two model runs were combined for the annual average to estimate the peak annual average concentration. For the shorter-term averages the higher concentration was reported from each of these phases because the track construction and the subsequent ballast deliveries would not occur simultaneously.

E.2.2 RAILROAD OPERATIONS IMPACT ASSESSMENT – CALIENTE RAIL ALIGNMENT

E.2.2.1 Overview

The operations impact assessment included estimating emissions and potential impacts to air quality associated with operation of the rail line and railroad operations support facilities.

E.2.2.1.1 Emissions from Rail line Operation

Spent nuclear fuel and high-level radioactive waste would be transported along the rail line sealed in rail casks. Each DOE cask car would have a gross weight as high as 240 metric tons (264 tons); naval cask cars would weight as much as 355 metric tons (390 tons). The railroad would operate for up to 50 years. DOE would use two to three 4,000-horsepower, diesel/electric locomotives with a maximum weight of approximately 180 metric tons (198 tons) when fully fueled and ready for use to transport the spent nuclear fuel and high-level radioactive waste.

Emissions associated with railroad operations would be related to the weight of the trains and their frequency. To conservatively estimate emissions, each train trip was assumed to operate with the nominal number of three cask cars per trip, but with the maximum number of locomotives and peak activity along the rail line. This estimate results in a total of six train cars (one escort car, three cask cars, and two buffer cars) plus the maximum number of three locomotive engines per trip, with an equal number returning unloaded each week.

DOE expects that train shipments to the repository would peak around 2013 to 2036 (DIRS 176173-Nevada Rail Partners 2006, Table 1, p. 4-2). At that time, there would be eight one-way cask train trips per week, in addition to the other trains anticipated to operate on the rail line. Other trains would include those needed for fuel-oil, repository construction, and maintenance-of-way trains. DOE expects the total rail traffic on the rail line during the peak year would average 17 one-way trips per week (DIRS 175036-BSC 2005, Table 4-2). DOE made the most conservative estimate of activity along the rail line by assuming this activity level throughout the life of the project. DOE then estimated emissions from railroad operations by combining this activity level with estimates of the weight and fuel consumption of the train and appropriate emission factors (DIRS 174085-Sierra Research 2004, pp. 6 and 18), and then dividing the emissions among the counties in which the railroad would operate. Although the level of activity would remain constant, because locomotive emission rates generally are expected to decrease throughout the life of the project due to improvement in emission control technologies, total emissions could decrease over the life of the project.

To assess the impact to air quality from railroad operations emissions near Goldfield (in Esmeralda County) and Caliente (in Lincoln County), DOE modeled air quality using the EPA AERMOD Version 07026 model (DIRS 174202 -EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all). In this assessment, a portion of the alternative segments that would pass nearest the two communities were modeled using local meteorological data. To assess the significance of potential impacts to air quality, comparisons were made with the applicable Nevada and National Ambient Air Quality Standards.

E.2.2.1.2 Emissions from Facility Operations

The operations impact assessment also included emissions and potential impacts to air quality associated with operation of the Interchange Yard in Lincoln County. Other facilities would have similar or smaller operations or would be too distant from public access; therefore, their potential to impact air quality would be low.

DOE treated operations at the Interchange Yard as continuous throughout the life of the proposed railroad. Details on the activity and emissions at these facilities were taken from the Caliente Rail Corridor Task 13 document (DIRS 180921-Nevada Rail Partners 2007, Appendix C) and *Facilities–Design Analysis Report Caliente Rail Corridor, Task 10: Facilities, Rev. 01* (DIRS 176168-Nevada Rail Partners 2006, all).

E.2.2.2 Lincoln County Detail

E.2.2.2.1 Emissions Inventory

DOE based the estimated amount of emissions expected to occur within Lincoln County from railroad operations on the possible rail alignments through the county (common segments and alternative segments), which range from approximately 132 kilometers (82 miles) to approximately 148 kilometers (92 miles) depending on the route chosen. Lincoln County was allocated the fraction of total emissions arising from railroad operations. Emissions from facility operations that would occur only in Lincoln County (operation of the Interchange Yard) were allocated solely to Lincoln County. Exhaust emissions attributable to operation of the railroad were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Lincoln County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.2.2.2.2 Air Quality Modeling

A portion of the Caliente alternative segment begins near Caliente and extends to the northwest for 1 kilometer (0.62 mile) through an area of private property near the city. DOE performed air quality modeling of the air pollutants released from railroad operations near Caliente using the EPA AERMOD Version 07026 (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2006, all; DIRS 181090-EPA 2004, all) dispersion model.

Caliente meteorological data was provided primarily by the Desert Research Institute-operated Community Environmental Monitoring Program. For missing hours in this record, DOE substituted data from the Pioche Community Environment Monitoring Program site (obtained from the Desert Research Institute) and cloud-cover data from McCarran International Airport in Las Vegas. This surface meteorological data represents the best available information for this region, for which meteorological data are sparse. Upper-air data were taken from Elko, Nevada (National Weather Service station 72582). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Elko is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record for 1999, 2000, and 2001 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

In all cases, DOE determined an appropriate emissions rate representing the average activity of the railroad corresponding to the above-determined total emissions with units of grams per second for the appropriate activity. Operations emissions were modeled with a release height of 5 meters (16 feet) to reflect locomotive emission release height (California Environmental Protection Agency 2004 [DIRS 173568], Appendix G). DOE assumed the railroad would operate 24 hours per day, 7 days per week.

DOE also modeled emissions with AERMOD based on the operation of the Interchange Yard on a 0.06-square-kilometer (15-acre) site in Caliente. Receptor locations were set surrounding the Interchange Yard along the public roads, which would parallel the Yard. Operations activities would include locomotive switcher and truck operations. DOE assumed the facility would operate 24 hours per day, 7 days per week. Appropriate emissions rates were determined that represented this average activity profile.

DOE determined the highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations from all receptors for each model year.

E.2.2.3 Nye County Detail

E.2.2.3.1 Emissions Inventory

DOE estimated total emissions that would be associated with operation of the railroad through Nye County using the same procedure as previously described for Lincoln County. The anticipated routes through Nye County range from 342 kilometers (213 miles) to 398 kilometers (247 miles).

The analysis compares operations-related emissions with 2002 Nye County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.2.2.3.2 Air Quality Modeling

Because none of the Caliente rail alignment alternative segments or common segments would pass near a community in Nye County, DOE did not perform any air quality modeling for proposed railroad operations.

E.2.2.4 Esmeralda County Detail

E.2.2.4.1 Emissions Inventory

DOE based the estimated amount of emissions expected to occur within Esmeralda County from railroad operations on the possible rail alignments (common segments and alternative segments) through the county, which range from approximately 22 kilometers (14 miles) to 44 kilometers (27 miles) depending on route chosen. Esmeralda County was allocated the fraction of total emissions that would result from railroad operations. Exhaust emissions attributable to railroad operations were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Esmeralda County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.2.2.4.2 Air Quality Modeling

DOE performed air quality modeling of the air pollutants that would be released from railroad operations near Goldfield using the EPA AERMOD Version 07026 dispersion model (DIRS 174202 -EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090 -EPA 2007, all). DOE modeled Goldfield alternative segment 4 over a total distance of 4.7 kilometers (2.9 miles) from northwest of the town, through the town, and turning to exit southeast of the town.

As with the Caliente modeling, the general layout was selected to reflect emissions into the area of private property around Goldfield. DOE modeled railroad operations emissions with a release height of 5 meters (16 feet) (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). DOE assumed the railroad would operate 24 hours per day, 7 days per week.

DOE used surface meteorological data from the Tonopah Nevada National Weather Service site in the analysis because of the complete hourly weather data, including cloud-cover data. DOE used matching upper-air meteorological data from the National Weather Service Mercury/Desert Rock site in the modeling. DOE was able to assemble a 4-year meteorological record for 1989, 1990, 1991, and 1992 of hourly data, and these data were preprocessed by AERMET for input into AERMOD. An emissions rate expressed in grams per second was determined to represent the average operation of the trains.

The highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at any receptor were determined for each modeled year.

E.2.3 SHARED-USE OPTION – CALIENTE RAIL ALIGNMENT

Although the Shared-Use Option would require the construction of some additional sidings in Lincoln and Nye Counties, the additional sidings would be placed parallel to existing track and would not require additional roadbed foundation, only laying of track. Given that these activities would result in minimal additional construction-related emissions over those produced under the Proposed Action without shared use, it was not necessary to calculate an annual emissions inventory, or conduct additional air quality modeling to assess construction-related impacts for the Shared-Use Option beyond those already conducted for evaluation of the Proposed Action without shared use.

DOE calculated emissions for the three additional round trips per week of commercial train activity consisting of 20 cars and three locomotives in each of the three counties. The emissions for each county were determined by scaling the total emissions along the Caliente rail alignment by the anticipated range of distances associated with the various possible rail alignment options through each county.

The analysis compares operations-related emissions associated with the Shared-Use Option with each county's 2002 data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO060NEI2002D.000, all).

Emissions would increase marginally beyond those associated with railroad operations without shared use. In turn, the maximum air pollutant concentrations would increase marginally. Therefore, DOE did not perform additional and separate air quality modeling of air pollutant concentrations for railroad operations along the Caliente rail alignment under the Shared-Use Option.

E.3 Mina Rail Alignment

The Mina rail alignment region of influence for air quality and climate consists of the five counties (Churchill, Lyon, Mineral, Esmeralda, and Nye) in Nevada through which the rail line would run. The largest population centers near the Mina rail alignment (Schurz, Hawthorne, Mina, and Silver Peak), and quarry sites (Garfield Hills and Malpais Mesa South).

DOE performed air quality modeling in seven Nevada locations along the Mina rail alignment: Schurz, Hawthorne, Garfield Hills, Mina, Silver Peak, Malpais Mesa, and Goldfield. The Department modeled a total of 14 scenarios, as listed in Table E-2.

Table E-2. Air quality modeling scenarios for railroad construction and operations along the Mina rail alignment.

Scenario	Activity	Location
1	Rail line construction	Near Schurz
2	Facility construction	Staging Yard in Hawthorne
3	Rail line construction	Near Hawthorne
4	Quarry operations	Potential quarry site at Garfield Hills
5	Rail line construction	Near Mina
6	Rail line construction	Near Silver Peak
7	Quarry operations	Potential quarry site at Malpais Mesa South
8	Rail line construction	Goldfield
9	Railroad operations	Near Schurz
10	Facility operations	Staging Yard in Hawthorne
11	Railroad operations	Near Hawthorne
12	Railroad operations	Near Mina
13	Railroad operations	Near Silver Peak
14	Railroad operations	Goldfield

E.3.1 CONSTRUCTION IMPACT ASSESSMENT – MINA RAIL ALIGNMENT

E.3.1.1 Overview

DOE assumed a total duration of the construction phase to be the shortest under consideration (4 years), with 36 months of construction and the remaining 12 months allocated to installation, testing of signal and communications equipment, and commissioning. This assumption produced conservative (high) emission estimates, because longer periods of construction would result in lower annual emission rates.

The construction impact assessment included emissions and impacts to air quality associated with construction of the rail line, access roads, wells, and construction material storage piles. *Construction Plan Mina Rail Corridor, Task 14: Construction Plan Mina Rail Corridor, Rev. 00* (DIRS 180875-Nevada Rail Partners 2007, all) provides additional detail on construction and associated emissions.

The construction impact assessment also included emissions and air quality impacts associated with the construction of a Staging Yard at Hawthorne in Mineral County, which DOE expects would occur during the first year of the construction phase. Details on the activity and emissions at this facility were taken from the *Air Quality Emission Factors and Socio-Economic Model Input Mina Rail Corridor, Task 13: EIS Interface Support, Rev. 02* (DIRS 180921-Nevada Rail Partners 2007, Chapters 2 and 3, Appendixes A through C).

E.3.1.1.1 Exhaust Emissions

DOE based the estimated exhaust emissions associated with construction of the proposed railroad along the Mina rail alignment on engineering estimates of activity levels for construction crews operating in either rugged or gentle terrain. The Department assumed the use of similar construction equipment in both types of terrain, but assumed that the duration of activities would be longer in rugged terrain. Rugged terrain would require significant cut-and-fill operations.

DOE estimated exhaust emissions (NO_x, PM_{10}, $PM_{2.5}$, SO_2, CO, VOCs) from both non-road and on-road equipment. Non-road equipment would include bulldozers, graders, front-end and backhoe loaders, excavators, scrapers, cranes, compactors, tampers, drills, and other equipment. On-road equipment would include equipment licensed for on-road use that would be used for construction of the railroad (such as pickup, dump, and water trucks).

To determine annual non-road equipment exhaust emissions, DOE used engineering estimates of equipment size, activity levels, annual hours of operation, and horsepower ratings for the construction equipment as reported in the Mina Rail Corridor Task 13 document (DIRS 180874-Nevada Rail Partners 2007, Appendix B). This document included in its analysis an adjustment to operating hours for the cut-and-fill operations. Emissions factors for corresponding classes of non-road equipment used in construction were conservatively estimated from Tier 1 (typically, 1997 to 2003 model-year equipment) emissions standards based on horsepower ratings from *Exhaust and Crankcase Emissions Factors for Non-road Engine Modeling—Compression-Ignition* (DIRS 174089-EPA 2004, all).

To determine exhaust emissions from on-road equipment, annual operating hours from the Mina Rail Corridor Task 13 document (DIRS 180874-Nevada Rail Partners 2007, Appendix B) were converted to annual miles traveled assuming average operating speeds of 24 kilometers (15 miles) per hour and combined with emissions factors for appropriate vehicle classifications from the EPA MOBILE 6.2 vehicle emission modeling software (DIRS 174201-EPA 2003, all; DIRS 181954-EPA 2007, all; DIRS 181955-EPA 2004, all).

E.3.1.1.2 Fugitive Dust Emissions

DOE estimated particulate-matter emissions from fugitive dust associated with construction activities along the Mina rail alignment based on the calculations in the Mina Rail Corridor Task 13 document (DIRS 180874-Nevada Rail Partners 2007, Appendix B). These calculations are based on EPA emission factor guidance from *AP-42, Compilation of Air Pollutant Emission Factors* (DIRS 103679-EPA 1991, Section 13.2.3) and the *WRAP Fugitive Dust Handbook* (DIRS 174081-Countess 2004, Chapters 3, 6, and 9). DOE estimated fugitive dust emissions for soil disturbance from grading, scraping, bulldozing, and other rail line construction activities; wind erosion; construction material stockpiles; construction and operation of concrete batch plants; construction camps; rail line facilities; quarry and excavation activities; and construction of new access roads or upgrades of unpaved roads.

The proposed rail line construction right-of-way would be nominally 150 meters (500 feet) on either side of the centerline of the rail alignment (300 meters [1,000 feet] total width). In addition, the Mina rail alignment would include:

- Two major bridges (over Beatty Wash and the Walker River) and a series of minor bridges
- Ten construction camps 0.1 square kilometer (25 acres) each
- Sites for three railroad operations support facilities (Hawthorne Staging Yard, Maintenance-of-Way Facility, and Rail Equipment Maintenance Yard) that would occupy 0.2 square kilometer, 0.06 square kilometer, 0.4 square kilometer (50, 15, and 100 acres), respectively
- A total of 18 kilometers (11 miles) of access roads to facilities, plus the access roads on either side of the rail line
- Three-hundred storage piles to be used in track construction that would be located along the rail route

Fugitive dust emissions would also be associated with the operation of batch plants (including two coarse and fine storage piles), with new road construction or upgrades, and with quarry and excavation operations. In addition to the rail roadbed construction activity, a substantial amount of fugitive dust emissions would be related to haul trucks in the construction zone.

DOE would ensure that best management practices were implemented during construction to minimize air emissions of particulates. These measures typically would include the application of water or other dust suppressants on disturbed land, and limiting vehicle speeds on all unpaved roads. The EPA provides guidance on estimating emissions, including emissions in specific size ranges and information on watering as a dust-control method for unpaved roads (*WRAP Fugitive Dust Handbook* [DIRS 174081-Countess 2004, pp. 3-13 and 3-14]) and in AP-42, Section 13.2.2 (DIRS 103679-EPA 1991, all). The handbook provides additional guidance on the effectiveness of water in suppressing fugitive dust during construction. Emissions-control efficiency ranges from approximately 40 to 85 percent for short durations (DIRS 174084-Piechota et al. 2002, all), depending on meteorology, soil water content, soil type, and other factors. Typical effectiveness values of 70 percent are characteristic of the southwestern United States (DIRS 174215-Maricopa County 2004) for applications on the order of hours. For realistic estimation of fugitive dust emissions, DOE assumed:

- A 74-percent best practice reduction for most fugitive-dust emission sources (DIRS 174081-Countess 2004, Executive Summary, p. 3, and p. 3-14)

Based on operational guidance, DOE assumed all of the following:

- An 84-percent reduction for construction material storage piles (DIRS 174081-Countess 2004, Executive Summary, p. 3)
- A 62-percent reduction for batch plant operations (DIRS 174081-Countess 2004, Table 4-2, p. 4-5)
- A 70-percent reduction for quarry operations (DIRS 174081-Countess 2004, Executive Summary, p. 3)

E.3.1.2 Churchill County Detail

E.3.1.2.1 Emissions Inventory

DOE based the total emissions expected to occur within Churchill County from rail line construction along the Mina rail alignment on the anticipated rail alignment options (common segments and alternative segments, and movement of construction materials such as concrete ties, steel rails, and ballast) through the county, which range from approximately 17 kilometers (11 miles) to approximately 31 kilometers (20 miles), depending on the route chosen. Churchill County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, and construction-material storage piles. DOE estimated annual exhaust and fugitive dust emissions of VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ that would be attributable to rail line construction activities in Churchill County. DOE determined the highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase. The analysis compares construction-related emissions with 2002 Churchill County data on annual pollutant emissions obtained from the EPA National Emission Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.1.2.2 Air Quality Modeling

Because the Department has not identified any potential quarry sites in Churchill County, and because of the relatively small amount of emissions that would be associated with construction in Churchill County, DOE did not perform any site-specific air quality modeling for that area.

E.3.1.3 Lyon County Detail

E.3.1.3.1 Emissions Inventory

DOE based the total emissions expected to occur within Lyon County from rail line construction along the Mina rail alignment on the anticipated rail alignment options (common segments and alternative segments, and movement of construction materials such as concrete ties, steel rails, and ballast) through the county, which range from approximately 61 kilometers (38 miles) to approximately 81 kilometers (51 miles), depending on the route chosen. Lyon County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, and construction-material storage piles. DOE estimated annual exhaust and fugitive dust emissions of VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ that would be attributable to rail line construction activities in Lyon County for each of the assumed 4 years of construction. The Department determined the highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase. The analysis compares construction-related emissions with 2002 Lyon County data on annual pollutant emissions obtained from the EPA National Emission Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.1.3.2 Air Quality Modeling

Because DOE has not identified any potential quarry sites in Lyon County, and because of the relatively limited amount of emissions that would be associated with construction in Lyon County, DOE did not conduct any site-specific air quality modeling.

E.3.1.4 Mineral County Detail

E.3.1.4.1 Emissions Inventory

DOE based the total emissions expected to occur within Mineral County from rail line construction along the Mina rail alignment on the anticipated rail alignment options (common segments and alternative segments, and movement of construction materials such as concrete ties, steel rails, and ballast) through the county, which range from approximately 153 kilometers (95 miles) to approximately 171 kilometers (106 miles), depending on the route chosen. Mineral County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, well construction, and construction-material storage piles. Emissions from construction activities that would occur only in Mineral County (for example, construction of the Hawthorne Interchange Yard, specific access roads, and one quarry) were allocated solely to Mineral County. The Department estimated annual exhaust and fugitive dust emissions of VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ that would be attributable to rail line construction activities in Mineral County, including construction of the Interchange Yard, for each of the assumed 4 years of construction. DOE determined the highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase. The analysis compares construction-related emissions with 2002 Mineral County data on annual pollutant emissions obtained from the EPA National Emission Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.1.4.2 Air Quality Modeling

E.3.1.4.2.1 Construction Activity. DOE modeled air quality to determine how construction activities would be likely to affect air pollutant concentrations near Schurz, Hawthorne (including the Hawthorne Staging Yard), and Mina. Modeling included both the rail line and the Staging Yard. All modeling runs were made using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE modeled Schurz using the meteorological data collected by the Walker River Paiute Tribe in Schurz as reported through the Tribal Environmental Exchange Network. For missing hours in this record, DOE substituted data from the Fallon, Nevada, site (obtained from the Desert Research Institute) and also used cloud-cover data from Fallon because Schurz does not record cloud-cover information. This surface meteorological data represents the best available information for Schurz. Upper-air data for this location were taken from Reno, Nevada (National Weather Service station 72489). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Reno is routine in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record for 2004, 2005, and 2006 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

DOE modeled Hawthorne, the Staging Yard location, and Mina using the meteorological data collected by National Renewable Energy Laboratory at Luning 7W as reported through the Western Region Climate Center. For missing hours in this record, DOE substituted data from the Fallon and Reno, Nevada, sites (obtained from the Desert Research Institute) and also used cloud-cover data from Fallon because Luning does not record cloud-cover information. This surface meteorological data represents the best hourly meteorological information available for Hawthorne. Upper-air data for this location were taken from Reno, Nevada (National Weather Service station 72489). Thus, it was possible to assemble a 3-year meteorological record for 2004, 2005, and 2006 of hourly data, and these data were preprocessed by AERMET for input into AERMOD.

Because DOE would use existing rail line near Hawthorne, construction emissions modeled included only the emissions from the use of locomotives to deliver ballast to subsequent portions of the rail line under construction once the initial rail had been laid. For locations south of the Hawthorne Staging Yard, where there is no existing track, construction emissions included both surface emissions from laying track and emissions from ballast delivery. Both modeling runs used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). DOE assumed rail line construction would occur at a rate of 260 hours per month. The peak results from the modeling runs were taken to determine all averaging periods.

DOE also modeled emissions from construction of the proposed 0.2-square-kilometer (50-acre) Hawthorne Staging Yard. DOE set receptor locations surrounding the proposed Staging Yard along the public roads that would parallel the Yard. Receptors were set at a standard breathing height of 1.8 meters (5.9 feet) and a release height of 0.5 meter (1.6 feet) was employed to reflect near surface releases from construction equipment. Construction activities would include surface work, laying track, and building structures for the Staging Yard. DOE assumed construction of the Staging Yard would occur at an average rate of 260 hours per month.

DOE also modeled air quality to determine the impact of emissions from construction near Schurz and Mina. DOE selected Schurz alternative segment 1 as the most conservative alignment in relation to proximity to Schurz and the exposure to emissions from rail line construction. All modeling runs were made using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

In all cases, emission rates were expressed in units of grams per second for the appropriate activity and the resulting highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at all receptors were determined for each model year.

For Schurz and Mina, DOE modeled construction emissions in two phases. The first phase modeled the emissions associated with construction activities, including surface disturbance, laying track, and other processes with a release height of 0.5 meter (1.6 feet) to reflect surface or near-surface releases from equipment activity. This represented the initial portion of rail line construction. For the second modeling phase, DOE modeled the emissions from the use of locomotives to deliver ballast to subsequent portions of the rail line under construction once the initial rail had been laid. This modeling used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). For both model runs, DOE assumed rail line construction would occur at a rate of 260 hours per month. The highest year results from the two model runs were combined for the annual average to estimate the peak annual average concentration. For the shorter-term averages, the higher concentration was reported from each of these phases because the track construction and the subsequent ballast deliveries would not occur simultaneously.

E.3.1.4.2.2 Quarry Activity. DOE also performed air quality modeling to estimate air pollutant concentrations resulting from activity at the Garfield Hills quarry site east of Hawthorne (DIRS 180881-Shannon & Wilson 2007, pp. 32-37). All modeling analyses were made using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE used the same set of meteorological data as used for Hawthorne and Mina.

DOE calculated emissions for each of the assumed 3 years of quarry operation, including emissions associated with construction of the quarry facilities during the first year of the construction phase. Emissions included those from the quarry, plant, railroad siding, and access roads. All sources were taken as surface-based releases. Annual emissions were distributed evenly over a 250-day-per-year work schedule, operating between 6:00 a.m. and 6:00 p.m. Receptor locations were set at the fence line surrounding the potential quarry and at a standard breathing height of 1.8 meters (5.9 feet).

Next DOE determined the highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations of each air pollutant at all receptors over all 3 years of meteorological data. Therefore, the analysis approach represents a conservative estimate of air pollutant concentrations.

E.3.1.5 Esmeralda County Detail

E.3.1.5.1 Emissions Inventory

DOE based the total emissions expected to occur within Esmeralda County from rail line construction along the Mina rail alignment on the anticipated rail alignment options (common segments and alternative segments, and movement of construction materials such as concrete ties, steel rails, and ballast) through the county, which range from approximately 134 kilometers (83 miles) to approximately 175 kilometers (109 miles), depending on the route chosen. Esmeralda County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, well construction, and construction-material storage piles. Emissions from construction activities that would occur only in Esmeralda County (for example, specific access roads, and one quarry) were allocated solely to Esmeralda County. DOE estimated annual exhaust and fugitive dust emissions of VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ that would be attributable to rail line construction activities in Esmeralda County for each of the assumed 4 years of construction. DOE determined the highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase. The analysis compares construction-related emissions with 2002 Esmeralda County data on annual pollutant emissions obtained from the EPA National Emission Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.1.5.2 Air Quality Modeling

E.3.1.5.2.1 Construction Activity. DOE modeled air quality to determine how construction activities would be likely to impact air pollutant concentrations near Goldfield and Silver Peak. All modeling was performed using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE modeled Silver Peak using the Tonopah Airport meteorological data collected by the National Weather Service. For missing hours in this record, DOE substituted data from the Desert Rock, Nevada, site (obtained from the Desert Research Institute). This surface meteorological data represents the best available hourly weather information for Silver Peak. Upper-air data for this location were taken from Desert Rock, Nevada. Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Desert Rock is routine in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record of hourly data for 2004, 2005, and 2006 for Silver Peak and a 4-year record for 1989, 1990, 1991, and 1992 for Goldfield. The older meteorological data were readily available for use in the Goldfield modeling. These data were preprocessed by AERMET for input into AERMOD.

DOE modeled air quality in Silver Peak to determine the impact of emissions from construction of the rail alignment. DOE modeled the alternative segment (Montezuma 1) as the most conservative segment in relation to proximity to Silver Peak and the exposure to emissions from rail line construction. DOE also modeled air quality to determine the impact of emissions from construction of a segment of the rail alignment (Goldfield alternative segment 4) passing near Goldfield extending for 4.7 kilometers (2.9 miles) near the town. DOE selected Goldfield alternative segment 4 as the most conservative segment in relation to proximity to population and the exposure to emissions from construction of the rail line. In addition to the receptors placed alongside the construction and permanent operations rights-of-way, DOE also placed five receptors at key locations within Goldfield. These include the tanks west of Goldfield alternative segment 4, the School Bus Maintenance Facility east of the segment, and three houses east of the segment at the periphery of the town nearest the alignment. DOE determined pollutant concentrations at each of these locations in addition to those at the rights-of-ways to indicate potential project impacts at key locations in addition to the overall maximum impact at any location along the modeling domain. All modeling was performed using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2006, all; DIRS 181090-EPA 2007, all).

In all cases, emission rates were expressed in units of grams per second or grams per second per square meter for the appropriate activity and the resulting highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at all receptors were determined for each model year.

DOE modeled the Silver Peak and Goldfield construction emissions in two phases. The first phase modeled the emissions associated with construction activities, including surface disturbance, laying track, and other processes with a release height of 0.5 meter (1.6 feet) to reflect surface or near-surface releases from equipment activity. This represented the initial portion of rail line construction. For the second modeling phase, DOE modeled the emissions from the use of locomotives to deliver ballast to subsequent portions of the rail line under construction once the initial rail had been laid. This modeling used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). For both modeling studies, DOE assumed rail line construction would occur at a rate of 260 hours per month. The highest-year results from the two modeling runs were combined for the annual average to estimate the peak annual average concentration. For the shorter-term averages, the higher concentration was reported from each of these phases because the track construction and the subsequent ballast deliveries would not occur simultaneously.

E.3.1.5.2.2 Quarry Activity. DOE also performed air quality modeling to estimate air pollutant concentrations resulting from activity at the potential Malpais Mesa quarry site near Goldfield (DIRS 180881-Shannon & Wilson 2007, pp. 14-21). All model runs were made using the AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE used the same set of meteorological data as used for Silver Peak. DOE calculated emissions for each of the assumed 3 years of quarry operations, including emissions associated with construction of the quarry facilities during the first year of the construction phase. Emissions included those from the quarry, plant, railroad siding, and access roads. All sources were taken as surface-based releases. Annual emissions were distributed evenly over a 250-day-per-year work schedule, operating between 6:00 a.m. and 6:00 p.m. Receptor locations were set at the fence line surrounding the potential quarry and at a standard breathing height of 1.8 meters (5.9 feet).

Next DOE determined the highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations of each air pollutant at all receptors over all 3 years of meteorological data. Therefore, the analysis approach represents a conservative estimate of air pollutant concentrations.

E.3.1.6 Nye County Detail

E.3.1.6.1 Emissions Inventory

DOE based the total emissions expected to occur within Nye County from construction of the proposed railroad along the Mina rail alignment on the proposed rail alignment options (common segments and alternative segments, and movement of construction materials such as concrete ties, steel rails, and ballast) through the county, which range from 126 kilometers (78 miles) to 148 kilometers (92 miles). Nye County was allocated the fraction of total emissions arising from rail line construction, alignment access road construction, well construction, and construction material storage piles. Emissions from construction activities that would occur only in Nye County (for example, the Rail Equipment Maintenance Yard and facility access roads) were allocated solely to Nye County. DOE estimated exhaust and fugitive dust emissions that would be attributable to rail line construction and associated facility construction activity in Nye County for each of the assumed 4 years of construction. The highest annual emission values for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$ over the 4-year construction phase were used in subsequent analysis.

E.3.1.6.2 Air Quality Modeling

Because no quarries are proposed for the southern portion of Nye County in the vicinity of the Mina alignment and the rail line would not pass near any communities, DOE did not conduct any site-specific air quality modeling.

E.3.2 RAILROAD OPERATIONS IMPACT ASSESSMENT – MINA RAIL ALIGNMENT

E.3.2.1 Overview

The operations impact assessment included estimating emissions and potential impacts to air quality associated with proposed railroad operations.

E.3.2.1.1 Emissions from Railroad Operations

Spent nuclear fuel and high-level radioactive waste would be transported along the proposed rail line sealed in rail casks. Each DOE cask car would have a gross weight as high as 240 metric tons (264 tons); naval cask cars would weigh as much as 355 metric tons (390 tons). The railroad would operate for up to 50 years. DOE would use two to three 4,000-horsepower, diesel/electric locomotives with a maximum weight of approximately 180 metric tons (198 tons) when fully fueled and ready for use to transport the spent nuclear fuel and high-level radioactive waste.

Emissions associated with railroad operations would be related to the weight of the trains and their frequency. To conservatively estimate emissions, each train trip was assumed to operate with the nominal number of three cask cars per trip, but with the maximum number of locomotives and peak activity along the rail line. This estimate results in a total of six train cars (one escort car, three cask cars, and two buffer cars) plus the maximum number of three locomotive engines per trip, with an equal number returning unloaded each week.

DOE expects that train shipments to the repository would peak around 2013 to 2036 (DIRS 176173-Nevada Rail Partners 2006, Table 1, p. 4-2). At that time, there would be eight one-way cask train trips per week, in addition to the other trains anticipated to operate on the rail line. Other trains would include those needed for fuel oil, repository construction, and maintenance-of-way trains. DOE expects the total rail traffic on the rail line during the peak year would average 17 one-way trips per week (DIRS 175036-BSC 2005, Table 4.2). DOE made the most conservative estimate of activity along the rail line by assuming this activity level throughout the life of the project. DOE then estimated emissions from railroad operations by combining this activity level with estimates of the weight and fuel consumption of the train and appropriate emission factors (DIRS174085-Sierra Research 2004, pp. 6 and 18), and then dividing the emissions among the counties in which the railroad would operate. Although the level of activity would remain constant, because emissions factors generally decrease throughout the life of the project due to improvement in locomotive control technologies, total emissions could decrease over the life of the project.

To assess the potential impacts to air quality from railroad operations emissions near Schurz, the Staging Yard, Hawthorne, and Mina (all in Mineral County) and Silver Peak (in Esmeralda County), DOE modeled air quality using the EPA AERMOD Version 07026 model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all). In this assessment, a portion of the alternative segments that would pass near the two communities were modeled as a series of volume sources using local historical meteorological data. To assess the significance of potential impacts to air quality, comparisons were made with the applicable National Ambient Air Quality Standards.

E.3.2.1.2 Emissions from Facility Operations

The operations impact assessment also included emissions and potential impacts to air quality associated with operation of the Hawthorne Staging Yard in Mineral County. Other facilities (such as the Maintenance-of-Way Facility) would have similar or smaller operations or would be too distant from public access; therefore, their potential to impact air quality would be low.

DOE treated operations at the Staging Yard at Hawthorne as continuous throughout the life of the proposed railroad. Details on the activity and emissions at these facilities were taken from the Mina Rail Corridor, Task 13: EIS Interface Support (DIRS 180874-Nevada Rail Partners 2007, Appendix C) and Facilities–Design Analysis Report Mina Rail Corridor, Task 10: Facilities (DIRS 180873-Nevada Rail Partners 2007, pp. 3-1 and 3-2).

E.3.2.2 Churchill County Detail

E.3.2.2.1 Emissions Inventory

DOE estimated total emissions that would be associated with operation of the railroad through Churchill County from railroad operations on the possible rail alignments through the county (common segments and alternative segments), which range from 17 kilometers (11 miles) to 31 kilometers (20 miles), or between 67 and 69 percent of the total Mina rail alignment. Based on this percentage, Churchill County was allocated a corresponding fraction of total emissions arising from railroad operations. Exhaust emissions attributable to operation of the railroad (none in Churchill County) were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Churchill County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.2.3 Lyon County Detail

E.3.2.3.1 Emissions Inventory

DOE based the estimated amount of emissions expected to occur within Lyon County from railroad operations on the possible rail alignments through the county (common segments and alternative segments), which range from approximately 81 kilometers (51 miles) to approximately 61 kilometers (38 miles) depending on the route chosen. Lyon County was allocated the fraction of total emissions arising from railroad operations. Exhaust emissions attributable to operation of the railroad were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Lyon County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.2.4 Mineral County Detail

E.3.2.4.1 Emissions Inventory

DOE based the estimated amount of emissions expected to occur within Mineral County from railroad operations on the possible rail alignments (common segments and alternative segments) through the county, which range from approximately 153 kilometers (95 miles) to 171 kilometers (106 miles) depending on route chosen. Mineral County was allocated the fraction of total emissions that would result from railroad operations. Exhaust emissions attributable to railroad operations, including facilities (Staging Yard at Hawthorne) were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Mineral County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.2.4.2 Air Quality Modeling

DOE performed air quality modeling of the air pollutants that would be released from railroad operations near the communities of Schurz, Hawthorne, and Mina, as well as in the vicinity of the Staging Yard using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

DOE modeled Schurz using the meteorological data collected by the Walker River Paiute Tribe in Schurz as reported through the Tribal Environmental Exchange Network. For missing hours in this record, DOE substituted data from the Fallon, Nevada, and Reno, Nevada sites (obtained from the Desert Research Institute) but also used cloud-cover data from Fallon as Schurz does not record cloud-cover information. This surface meteorological data represents the best available information for Schurz. Upper-air data for this location were taken from Reno, Nevada (National Weather Service station 72489). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Reno is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record of hourly data for 2004, 2005, and 2006. These data were preprocessed by AERMET for input into AERMOD.

DOE modeled Hawthorne, the Staging Yard, and Mina using the meteorological data collected by National Renewable Energy Laboratory at Luning 7W as reported through the Western Region Climate Center. For missing hours in this record, DOE substituted data from the Fallon, Nevada, site (obtained from the Desert Research Institute) and also used cloud-cover data from Fallon as Luning does not record cloud-cover information. This surface meteorological data represents the best hourly meteorological information available for Hawthorne. Upper-air data for this location were taken from Reno, Nevada, (National Weather Service station 72489). Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Reno is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record of hourly data for 2004, 2005, and 2006 and these data were preprocessed by AERMET for input into AERMOD.

DOE selected Schurz alternative segment 1 as the most conservative segment in relation to proximity to Schurz, Hawthorne, and Mina using the common segments. All modeling was made using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all). These model runs used a release height of 5 meters (16 feet) to reflect locomotive emission release height (DIRS 173568-California Environmental Protection Agency 2004, Appendix G). The peak results from the modeling runs were taken to determine all averaging periods.

DOE also modeled emissions from operation of the proposed 0.2-square-kilometer (50-acre) Staging Yard at Hawthorne. DOE set receptor locations surrounding the proposed Staging Yard along the public roads that would parallel the Yard. Receptors were set at a standard breathing height of 1.8 meters (5.9 feet) and a release height of 0.5 meter (1.6 feet) was employed to reflect near- surface releases from equipment and dust. Operations activities would include light running repairs, switching between Union Pacific Railroad and DOE locomotives, sorting of trains for delivery, and car inspection, refueling, and sanding. In all cases, emission rates were expressed in units of grams per second or grams per second per square meter for the appropriate activity and the resulting highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at all receptors were determined for each model year.

E.3.2.5 Esmeralda County Detail

E.3.2.5.1 Emissions Inventory

DOE based the estimated amount of emissions expected to occur within Esmeralda County from railroad operations on the possible rail alignments (common segments and alternative segments) through the county, which range from approximately 134 kilometers (83 miles) to 175 kilometers (109 miles) depending on route chosen. Esmeralda County was allocated the fraction of total emissions that would result from railroad operations. Exhaust emissions attributable to railroad, including support facilities (Maintenance-of-Way Facility in Esmeralda County), were computed with the peak annual emissions for VOCs, CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

The analysis compares operations-related emissions with 2002 Esmeralda County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.2.5.2 Air Quality Modeling

DOE modeled Silver Peak and Goldfield using the Tonopah Airport meteorological data collected by the National Weather Service. For missing hours in this record, DOE substituted data from the Desert Rock, Nevada, site (obtained from the Desert Research Institute). This surface meteorological data represents the best available hourly weather information for Silver Peak. Upper-air data for this location were taken from Desert Rock, Nevada. Upper-air data are representative of a much larger geographical area than surface stations and the use of upper-air data from a distance as far away as Desert Rock is routinely done in air quality analyses. Thus, it was possible to assemble a 3-year meteorological record of hourly meteorological data for 2004, 2005, and 2006 for Silver Peak and a 4-year meteorological record for 1989, 1990, 1991, and 1992 for Goldfield. The older meteorological data was readily available for use in the Goldfield modeling. These data were preprocessed by AERMET for input into AERMOD.

DOE modeled air quality in Silver Peak to determine the impact of emissions from operation of the rail alignment near Silver Peak. DOE modeled the alternative segment (Montezuma 1) as the most conservative alignment in relation to proximity to Silver Peak and the exposure to emissions from railroad operations. DOE also modeled air quality to determine the impact of emissions from the operation of a segment of the rail alignment (Goldfield alternative segment 4) passing near Goldfield extending for 4.7 kilometers (2.9 miles) near the town. DOE selected Goldfield alternative segment 4 as the most conservative alignment in relation to proximity to population and the exposure to emissions from operation of the railroad. In addition to the receptors placed alongside the construction and permanent operation rights-of-way, DOE also placed five receptors at key locations in Goldfield. These include the tanks west of Goldfield alternative segment 4, the School Bus Maintenance Facility east of the alignment, and three houses east of the alignment at the periphery of the town nearest the alignment. DOE determined pollutant concentrations at each of these locations in addition to those at the rights-of-way to indicate potential project impact at key locations in addition to the overall maximum impact at any location along the modeling domain. All model runs were made using the EPA AERMOD Version 07026 dispersion model (DIRS 174202-EPA 2002, all; DIRS 181091-EPA 2004, all; DIRS 181090-EPA 2007, all).

The highest 1-hour, 3-hour, 8-hour, 24-hour, and annual average concentrations at any receptor were determined for each model year.

E.3.2.6 Nye County Detail

E.3.2.6.1 Emissions Inventory

DOE estimated total emissions that would be associated with operation of the railroad through Nye County using the same procedure as previously described for Esmeralda County. The anticipated routes through Nye County range from 126 kilometers (78 miles) to 148 kilometers (92 miles).

The analysis compares operations-related emissions with 2002 Nye County data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

E.3.3 SHARED-USE OPTION – MINA RAIL ALIGNMENT

Although the Shared-Use Option would require the construction of some additional sidings along the alignment, the additional sidings would be placed parallel to existing track and would not require additional roadbed foundation, only laying of track. Given that these activities would result in minimal additional construction-related emissions over those produced under the Proposed Action without shared use, it was not necessary to calculate an annual emissions inventory, or conduct additional air quality model runs to assess construction-related impacts for the Shared-Use Option beyond those already conducted for evaluation of the Proposed Action without shared use.

DOE calculated emissions for 18 additional one-way trips per week north of Schurz and ten additional one-way trips south of Schurz of commercial train activity consisting of 60 cars and three locomotives. The emissions for each county were determined by scaling the total emissions along the Mina rail alignment by the anticipated range of distances associated with the various possible rail alignment options through each county.

The analysis compares operations-related emissions associated with the Shared-Use Option with each county's 2002 data on annual air pollutant emissions obtained from the EPA National Emissions Inventory database (DIRS 177709-MO0607NEI2002D.000, all).

Emissions would increase marginally beyond those associated with railroad operations without shared use. In sum, the maximum air pollutant concentrations would increase marginally. Therefore, DOE did not perform additional and separate air quality modeling of air pollutant concentrations for railroad operations along the Mina rail alignment under the Shared-Use Option.

E.4 Glossary

AERMAP (AERMOD Maps terrain Preprocessor)	The terrain preprocessor that uses data from the Digital Elevation Model Database and creates a file suitable for use within AERMOD. This file contains elevation and hill-height scaling factors for each receptor for use by AERMOD.
AERMET (AERMOD Meteorological Preprocessor)	The meteorological preprocessor component of AERMOD. Surface meteorological observations, hourly cloud-cover observations, and twice-a-day upper air sounds are "preprocessed" by AERMET into data used by AERMOD.
AERMOD (AMS/EPA Regulatory Model)	A short-range steady-state air quality dispersion model. The model incorporates air dispersion concepts based on the state-of-the-science understanding of planetary boundary layer turbulence structure and scaling concepts. AERMOD became the U.S. Environmental Protection Agency preferred air dispersion model in place of ISC3 on December 9, 2005.
ambient air	The surrounding atmosphere, usually the outside air, as it exists around people, plants, and structures. It is not the air in the immediate proximity to emission sources.
carbon monoxide	A colorless, odorless, poisonous gas produced by incomplete fossil-fuel combustion; one of the six pollutants for which there is a national ***ambient air quality standard***.
criteria air pollutants	Six common pollutants (***ozone***, ***carbon monoxide***, ***particulate matters***, ***sulfur dioxide***, lead, and ***nitrogen dioxide***) known to be hazardous to human health and the environment, and for which the U.S. Environmental Protection Agency sets National ***Ambient Air Quality Standards*** under the Clean Air Act. See ***toxic air pollutants***.
fugitive dust	***Particulate matter*** composed of soil; can include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is removed or redistributed.
hazardous chemical	As defined under the Occupational Safety and Health Act (Public Law 91-956) and the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 116), a chemical that is a physical or health hazard.

hazardous pollutant	A ***hazardous chemical*** that can cause serious health and environmental hazards; listed on the federal list of hazardous air pollutants (Clean Air Act; 42 U.S.C. 7412). See ***toxic air pollutants***.
National Ambient Air Quality Standards	Standards established on a federal or state level that define the limits for airborne concentrations of designated ***criteria pollutants*** [***nitrogen dioxide***, ***sulfur dioxide***, ***carbon monoxide***, ***particulate matter*** with aerodynamic diameters less than 10 micrometers (PM_{10}), particulate matter with aerodynamic diameters less than 2.5 micrometers ($PM_{2.5}$), ***ozone***, and lead] to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).
nitrogen dioxide	See ***nitrogen oxides***.
nitrogen oxides (oxides of nitrogen)	Gases formed in great part from atmospheric nitrogen and oxygen when combustion occurs under conditions of high temperature and high pressure; a major air pollutant. Two primary nitrogen oxides, nitric oxide (NO) and ***nitrogen dioxide*** (NO_2), are noteworthy airborne ***contaminants***. Nitric oxide combines with atmospheric oxygen to produce nitrogen dioxide. Both nitric oxide and ***nitrogen dioxide*** can, in high concentrations, cause lung ***cancer***. ***Nitrogen dioxide*** is a ***criteria air pollutant***.
particulate matter	Any finely divided solid or liquid material other than pure water (such as dust, smoke, mist, fumes, or smog) found in air or emissions.
sulfur dioxide	A pungent, colorless gas produced during the burning of sulfur-containing fossil fuels. It is the main pollutant involved in the formation of acid rain. Coal- and oil-burning electric utilities are the major source of sulfur dioxide in the United States. Inhaled sulfur dioxide can damage the human respiratory tract and can severely damage vegetation. See ***criteria air pollutants***, ***National Ambient Air Quality Standards***.
toxic air pollutants	***Hazardous pollutants*** not listed as either ***criteria air pollutants*** or hazardous pollutants.

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