NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR
LAKE MEAD NATIONAL RECREATION AREA
NEVADA AND ARIZONA

Boulder City Bypass

SPECIAL USE PERMIT
Environmental Assessment

LAKE MEAD NATIONAL RECREATION AREA

August 2014

NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR

Lake Mead National Recreation Area
Nevada and Arizona

Boulder City Bypass Special Use Permit Environmental Assessment
Lake Mead National Recreation Area

ENVIRONMENTAL ASSESSMENT

August 2014

SPECIAL USE PERMIT ENVIRONMENTAL ASSESSMENT TO FACILITATE THE CONSTRUCTION OF THE INTERSTATE 11 BOULDER CITY BYPASS

Lake Mead National Recreation Area
Clark County, Nevada

The National Park Service has developed this environmental assessment to identify potential impacts on resources within Lake Mead National Recreation Area that may result from the issuance of a special use permit. The special use permit is being requested by the Regional Transportation Commission of Southern Nevada to facilitate construction of the Interstate 11 Boulder City Bypass. As a cooperating agency during prior planning efforts, the National Park Service has authorized the use of this part of Lake Mead National Recreation Area to support the bypass project. Design refinements and mitigation measures identified in prior planning efforts warrant the request for a special use permit.

This environmental assessment evaluates the no-action alternative and one action alternative. The no-action alternative would maintain existing conditions, and a special use permit would not be issued. The action alternative would include the issuance of a special use permit to relocate an approximately 1-mile portion of the Colorado River Commission's existing Mead-Eastside/Equestrian #2 transmission line within an existing transmission corridor; use existing unpaved backcountry roads to access areas where the transmission relocation is proposed and where road grading is planned; and install a temporary waterline from Lake Mead to areas where construction activities are proposed.

This environmental assessment was prepared in accordance with the National Environmental Policy Act of 1969 and implementing regulations, 40 Code of Federal Regulations 1500–1508, and the National Park Service Director's Order 12 and Handbook, *Conservation Planning, Environmental Impact Analysis, and Decision-making*, to provide the decision-making framework that (1) analyzes all reasonable alternatives to meet the objectives of the proposal, (2) evaluates potential issues and impacts on resources and values, and (3) identifies mitigation measures to lessen the degree or extent of these impacts.

HOW TO COMMENT ON THIS PLAN

If you wish to comment on the environmental assessment, you may post comments online at http://parkplanning.nps.gov/ or mail them to: Lake Mead National Recreation Area, Compliance Office, 601 Nevada Way, Boulder City, Nevada 89005. This environmental assessment will be on public review for 30 days. Before including personal identifying information, be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. Although you can ask us to withhold this information from public review, we cannot guarantee that we will be able to do so. Comments will not be accepted by fax, email, or in any other way than those specified above. Bulk comments in hard copy or electronically submitted on behalf of others will not be accepted.

CONTENTS

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION 1

Introduction 1

Purpose of and Need for Action 1

Project Location 2

Project Background 2

Issues and Impact Topics 5

Soils and Vegetation 5

Fish and Wildlife and their Habitats 5

Water Resources 5

Air Quality 5

Soundscapes 6

Cultural Resources 6

Visitor Use and Experience 6

Public Health and Safety 6

Impact Topics Dismissed from Further Analysis 6

Evaluation of Electromagnetic Fields in Public Health and Safety 7

Climate Change 7

Relationship to Laws, Executive Orders, and Policies 8

Lake Mead National Recreation Area Enabling Legislation 8

Applicable Federal and State Laws 9

Other Applicable Executive Orders, Regulations, and Policies 12

CHAPTER 2: ALTERNATIVES 15

Introduction 17

No-Action Alternative 17

Alternative 1 (Action Alternative): Issuance of a Special Use Permit 17

Transmission Line Relocation 18

Access Road Used During Construction and Periodic Maintenance 20

Installation of a Temporary Waterline to Support Construction Activities 21

Mitigation and Monitoring 23

Alternatives or Alternative Elements Considered but Dismissed from Further Evaluation 27

Raising the Colorado River Commission's Transmission Facilities 27

Use of Trucks to Transport Water from Lake Mead or Boulder City to Construction Staging Areas 27

Waterline Running from the Wasterwater Treatment Facility in Boulder City to Construction Staging Areas 28

Environmentally Preferable Alternative 28

National Park Service Preferred Alternative 29

Comparison of Impacts 29

CHAPTER 3: AFFECTED ENVIRONMENT 31

Soils 33

Sunrock-Haleburu-Rock Outcrop Association 35

Haleburu-Crosgrain-Rock Outcrop Association 35

Sunrock-Rock Outcrop Association 35

Carrizo-Carrizo-Riverbend Association 36

Vegetation 36

Protected and Sensitive Plant Species 38

Fish and Wildlife and their Habitats 39

Special-Status Wildlife Species 39

Water Resources 41

Surface Water 41

Groundwater 43

Water Quality 43

Waters of the United States 43

Wetlands 45

Air Quality 45

National Ambient Air Quality Standards 45

Soundscapes 49

Cultural Resources 50

Cultural Setting 51

Previously Documented Cultural Resources 51

Visitor Use and Experience 55

Public Health and Safety 56

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES 59
Introduction 61
General Analysis Method 61
Cumulative Effects Analysis Method 62
Identified Cumulative Actions 62
Impacts on Natural Resources 64
Impacts On Soils 64
Impacts on Vegetation 69
Impacts on Fish and Wildlife and their Habitats 74
Impacts on Water Resources 79
Impacts on Air Quality 84
Impacts on Soundscapes 88
Impacts on Cultural Resources 94
Impacts on Visitor Use and Experience 97
Impacts on Public Health and Safety 102
CHAPTER 5: CONSULTATION AND COORDINATION 107
The Scoping Process 109
Internal Scoping 109
Public Scoping 109
Public Scoping Comments 110
Agency Consultation 110
Recipients of the Environmental Assessment 111
APPENDIXES AND INDEX 113
APPENDIX A: REFERENCES 115
APPENDIX B: PREPARERS AND CONSULTANTS 125
APPENDIX C: ACRONYMS AND ABBREVIATIONS 129
APPENDIX D: PLANT SPECIES OBSERVED IN THE BYPASS STUDY AREA, MAY 2014 133
APPENDIX E: ENDANGERED SPECIES ACT SPECIES LIST (USFWS 2014) 137
APPENDIX F: USFWS SPECIES CONSIDERED 139
APPENDIX G: OTHER STATE-LISTED SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE ACTION AREA 147

TABLES

Table 1. Mitigation Measures for the Action Alternative: Issuance of Special Use Permit 24
Table 2. Impacts of Project Alternatives 30
Table 3. Soils in the Study Area 35
Table 4. Potential State Species of Concern in the Study area 38
Table 5. National Ambient Air Quality Standards 46
Table 6. 2013 Regional Air Quality Monitoring Data 48
Table 7. Common Noise Levels 50
Table 8. Noise Levels Produced by Typical Construction Equipment 91

FIGURES

Figure 1. Project Area Map 3
Figure 2. Project Elements Associated with the Special Use Permit 18
Figure 3. Existing Transmission Line to be Partially Relocated 19
Figure 4. Proposed Alignment of the Waterline 22
Figure 5. Soils in the Study Area 34
Figure 6. Land Cover in the Project Area 37
Figure 7. Surface Water Drainages 42
Figure 8. Ephemeral Drainages (Waters of the United States) 44
Figure 9. Marinas in Hemenway and Horsepower Cove 55
Figure 10. Historic Railroad Trail 56

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

The National Park Service (NPS) is evaluating a request from the Regional Transportation Commission of Southern Nevada (RTC) to issue a special use permit to facilitate the construction of the proposed Interstate 11 (I-11) Boulder City Bypass (hereafter referred to as "bypass project"). The majority of the bypass project would be sited in Boulder City, Clark County, Nevada. The eastern portion of the bypass project would traverse Lake Mead National Recreation Area (NRA) in the vicinity of the Hacienda Hotel and Casino along United States Highway 93 (US Highway 93).

An environmental impact statement (EIS) for the bypass project was completed in 2005 (FHWA 2005). As a cooperating agency throughout the planning process, the National Park Service authorized the use of this portion of Lake Mead NRA to support the bypass project. However, since the completion of the environmental impact statement, previously identified project elements or mitigation measures that would occur within Lake Mead NRA have been refined, and subsequently require additional analysis.

This environmental assessment (EA) evaluates two alternatives—the no-action alternative and one action alternative. The no-action alternative would maintain existing conditions, and the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada, which would require design modifications to the bypass project. The action alternative includes the issuance of a special use permit to Regional Transportation Commission of Southern Nevada to implement the three project elements described in this environmental assessment, which would facilitate the construction of the bypass project (see "Chapter 2: Alternatives" for a discussion of project elements associated with the action alternative). The environmental assessment identifies resource areas carried forward for analysis or dismissed from further consideration, and potential impacts on the natural and human environment that may result from the two alternatives. It also identifies alternatives or alternative elements that have been dismissed from further consideration, and describes the consultation and public outreach that took place as part of this planning process.

This document was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, and implementing regulations, 43 Code of Federal Regulations (CFR) part 46, 40 CFR 1500–1508, and Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (Director's Order 12) (NPS 2001).

PURPOSE OF AND NEED FOR ACTION

The purpose of this environmental assessment is to determine if the issuance of a special use permit is feasible and in accordance with NPS policies considering potential impacts on the natural and human environment that may result.

The National Park Service must respond to the request by the Regional Transportation Commission of Southern Nevada to issue a special use permit to implement project elements identified in the action alternative to support construction of the bypass project.

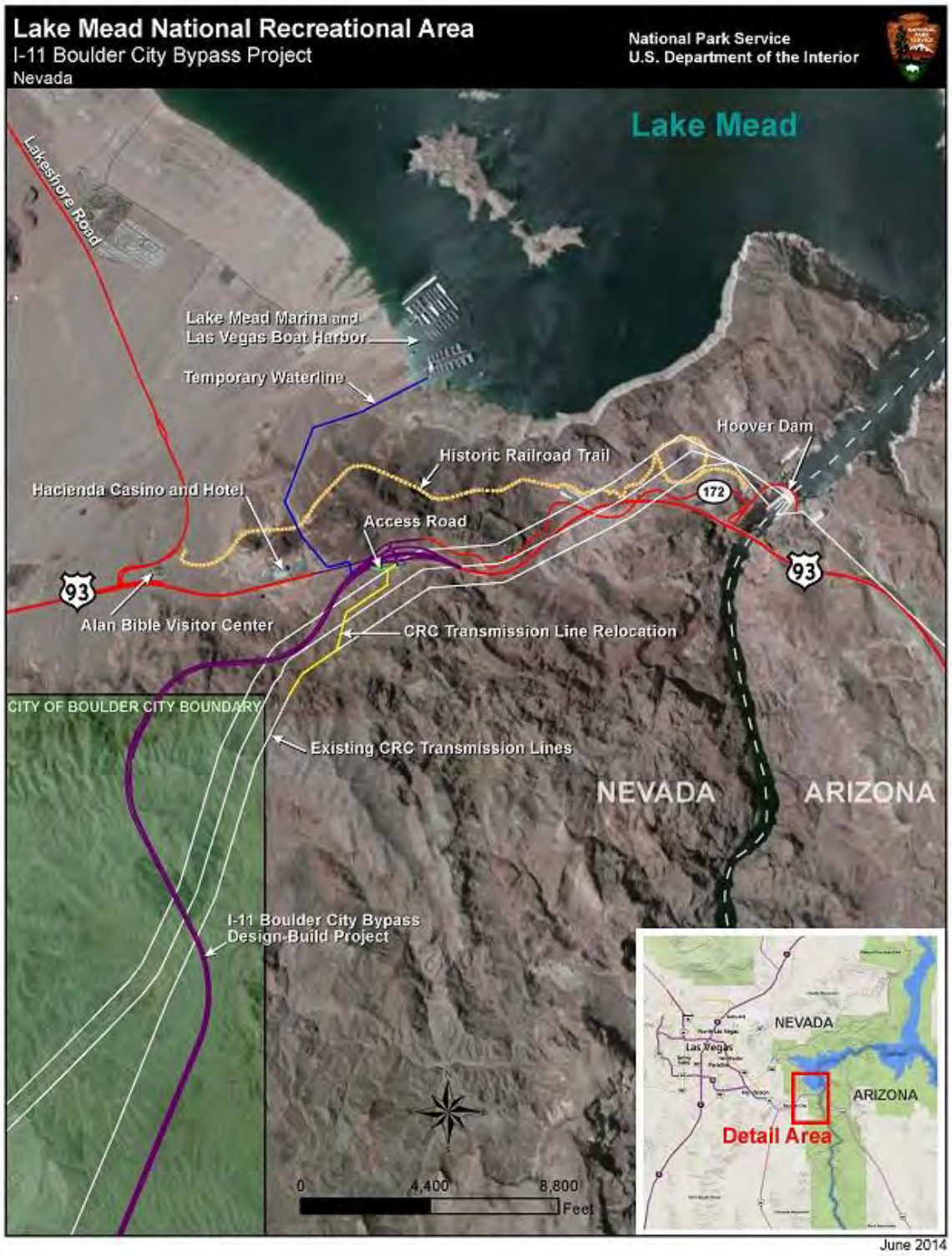
PROJECT LOCATION

The project area is located northeast of Boulder City and west of the Hoover Dam in Clark County, Nevada. The three elements that comprise the action alternative would be sited in the Boulder Basin Zone of Lake Mead NRA on either side of US Highway 93 near the Hacienda Hotel and Casino. The project area extends from Hemenway Harbor near the Lake Mead Marina and Las Vegas Boat Harbor to the Lake Mead NRA boundary with Boulder City, and includes a portion of the Historic Railroad Trail north of US Highway 93 and designated backcountry areas on the south side of US Highway 93 (see figure 1).

PROJECT BACKGROUND

In 2005, the Federal Highway Administration (FHWA) as the lead agency and the Nevada Department of Transportation (NDOT) as the sponsor agency completed the Boulder City/U.S. Highway 93 Corridor Study and Environmental Impact Statement (2005 EIS) for the bypass project. The 2005 EIS evaluated the feasibility and potential impacts associated with four alignment alternatives for the bypass project. Cooperating agencies throughout the decision-making process included the National Park Service, Regional Transportation Commission of Southern Nevada, US Bureau of Reclamation, Western Area Power Administration, Bureau of Land Management, Clark County, and the cities of Boulder City and Henderson.

As part of the 2005 EIS, NPS staff prepared and signed an impairment determination in July 2002. The impairment determination analyzed whether the resources within Lake Mead NRA that would experience major impacts from the implementation of the bypass project's preferred alternative would be impaired. Resources that were evaluated in the impairment determination include biological resources, with particular focus on bighorn sheep and desert tortoise habitat; land use; soundscapes; air quality; and ethnography. The impairment determination concluded that the bypass project's preferred alternative would not impair the resources or values necessary to fulfill the specific purposes of Lake Mead NRA's enabling legislation or those that are critical to the natural and cultural integrity of Lake Mead NRA. The implementation of the bypass project would not alter opportunities to enjoy the resources contained within Lake Mead NRA nor would it violate the NPS *Organic Act of 1916*.



Source: Louis Berger

FIGURE 1. PROJECT AREA MAP

The Record of Decision, signed in December 2005, documents FHWA's approval of the preferred alternative as the selected alternative. The selected alternative for the bypass project includes a new, approximately 12-mile long, four-lane divided, full access-controlled roadway from the area just north of the US Highway 95 interchange at the western terminus to the Hoover Dam/Nevada interchange at State Route 172 (SR 172) at the eastern terminus. The easternmost 1.5 miles of the bypass project would be located within Lake Mead NRA. The project has been designed to improve vehicular circulation and access to local businesses on and around the US Highway 93 corridor by reducing traffic congestion, increasing safety, and improving regional mobility. The bypass project has been identified as a critical element in RTC's Regional Transportation Plan and Transportation Improvement Program as well as NDOT's Statewide Transportation Program.

The 2005 EIS identified the need to relocate an approximately 1-mile portion of the Colorado River Commission's (CRC) Mead-Eastside/Equestrian #2 transmission line out of the bypass project's right-of-way. This action, which would occur within Lake Mead NRA, was previously authorized by the National Park Service. However, since the completion of the EIS, the alignment of the proposed transmission line relocation has been revised as a result of design refinements of the bypass project, and therefore, further analysis is required.

To support construction of the bypass project and transmission line relocation, existing unpaved roads and other areas require grading in backcountry areas within Lake Mead NRA. Additionally, the Regional Transportation Commission of Southern Nevada is proposing a temporary 6-inch water line that would extend from Lake Mead to construction staging areas to provide water for dust suppression, processing of excavated material, and compaction of embankment material during construction activities. Dust suppression was identified as a mitigation measure in the 2005 EIS and Record of Decision.

The 2005 EIS did not address these specific proposed project elements and associated environmental impacts in a sufficient level of detail, and consequently, requirements set forth in the National Environmental Policy Act and NPS *Management Policies 2006* have not been fully satisfied.

The Department of the Interior regulations for implementing the National Environmental Policy Act stipulate that an environmental assessment can be prepared, and subsequently a finding of no significant impact issued, for a proposed action with significant effects (direct, indirect, or cumulative) if the environmental assessment is tiered to a broader environmental impact statement in which significant effects are fully evaluated and no previously unanalyzed effects are significant (43 CFR 46). Because the previously identified project elements and mitigation measures would not cause previously unanalyzed significant effects, it has been determined that an environmental assessment is the appropriate level of documentation for evaluating potential impacts associated with the project elements proposed as part of the special use permit.

This environmental assessment has been prepared to meet all applicable federal requirements for evaluating potential impacts associated with project elements that would be included as part of the special use permit. Project elements are described in detail in "Chapter 2: Alternatives."

ISSUES AND IMPACT TOPICS

Issues are related to potential environmental impacts that may result from action alternatives and were identified by NPS staff and subject-matter experts based on knowledge of the project area; alternatives; and the need to address appropriate federal laws, regulations, and orders and NPS *Management Policies 2006*. The following impact topics and associated issues are carried forward for detailed analysis in this environmental assessment.

The current condition of these resources in the project area is described in "Chapter 3: Affected Environment." Potential impacts on these resources are discussed in "Chapter 4: Environmental Consequences."

SOILS AND VEGETATION

The action alternative includes the relocation of approximately 1 mile of CRC's existing Mead-Eastside/Equestrian #2 transmission line and the removal of above-grade parts of transmission infrastructure taken out of service. Within this area, soils would be disturbed and/or reclaimed to support these actions, and vegetation would be removed, as necessary. There would also be a limited amount of soil disturbance associated with use of unpaved access roads and grading of other areas to support the movement of heavy material haul trucks in the vicinity of the relocated transmission line. Because soils and vegetation would be disturbed, removed, and/or reclaimed in localized areas as a result of the action alternative, this topic requires further analysis.

FISH AND WILDLIFE AND THEIR HABITATS

The action alternative would include construction in backcountry areas within Lake Mead NRA where wildlife, including special-status species, is present. It would also include the removal of water from Lake Mead, and mitigation measures are likely necessary to ensure that fish, particularly special-status species, are protected from water intake methods. Therefore, this topic requires further analysis.

WATER RESOURCES

The issuance of a special use permit under the action alternative would allow the Regional Transportation Commission of Southern Nevada to remove water from Lake Mead via a waterline to support construction activities associated with the bypass project. Because the action alternative would affect water resources, this topic requires further analysis.

AIR QUALITY

Construction activities associated with the installation of a new and removal of the existing transmission line would disturb soils and increase fugitive dust in localized areas. The movement of

heavy material haul trucks on unpaved backcountry access roads would also increase fugitive dust and vehicular emissions in localized areas. Because the action alternative would increase fugitive dust and vehicular emissions in localized areas during construction activities, this topic requires further analysis.

SOUNDSCAPES

Construction activities associated with the transmission line relocation and the removal of above-grade parts of the transmission line taken out of service would temporarily increase noise in the vicinity of these activities. In addition, the movement of heavy material haul trucks to support the installation of the waterline and generators/pumps to ensure the efficiency of its operation would increase noise in localized areas while these activities are ongoing. Therefore, this topic requires further analysis.

CULTURAL RESOURCES

The area of potential effects for reviews under section 106 of the National Historic Preservation Act includes the areas of direct and indirect impact. Construction activities associated with the installation of a new and removal of the existing transmission line would disturb soils in localized areas. Therefore, this topic requires further analysis.

VISITOR USE AND EXPERIENCE

Actions identified as part of the special use permit would occur within Lake Mead NRA, and subsequently, in areas frequented by visitors. To understand how the issuance of the special use permit may affect visitor use and experience, evaluation of visitor patterns is necessary. Therefore, this topic requires further analysis.

PUBLIC HEALTH AND SAFETY

In Lake Mead NRA and in areas frequented by visitors, construction activities would occur as part of the special use permit. In these areas, there may be increased risks to public health and safety as a result of construction activities. Therefore, this topic requires further analysis.

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

The following impact topics were dismissed from further analysis in this environmental assessment because impacts on these resources are (1) not anticipated to exceed negligible as a result of the action alternative or (2) the resource is not present in the project area. Impact topics dismissed from further analysis include floodplains, wild and scenic rivers, night skies, visual resources, Indian trust resources, historic structures, museum collections, paleontology, land use adjacent to Lake Mead NRA, wilderness, prime and unique farmlands, socioeconomics, and environmental justice.

In addition, the following section describes the rationale for dismissing the evaluation of electromagnetic fields produced by transmission lines in the public health and safety analysis, visual resources, and climate change as impact topics. An emphasis on the dismissal of climate change is provided because of recent NPS policies and initiatives designed to help address this growing issue.

EVALUATION OF ELECTROMAGNETIC FIELDS IN PUBLIC HEALTH AND SAFETY

Transmission lines produce electromagnetic fields, which have the potential to present risks to public health and safety. Because the issuance of a special use permit would allow for the relocation of an existing transmission line within a heavily used transmission corridor (by other transmission lines) and would not change the voltage requirements of the line itself, an evaluation of electromagnetic fields is not included in the public health and safety analysis.

CLIMATE CHANGE

Climate change refers to any substantial changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality and storm frequency) lasting for an extended period (decades or longer). Recent reports by the US Climate Change Science Program and United Nations Intergovernmental Panel on Climate Change, among others, provide clear evidence that climate change is occurring and will accelerate in the coming decades (US Climate Change Science Program 2014, Intergovernmental Panel on Climate Change 2013). Understanding of the effects of climate change on national parks is emerging as both science and impact measurements become clearer.

The National Park Service recognizes that the major drivers of climate change are outside the agency's control but climate change impacts throughout the national park system must be addressed. Consequently, the National Park Service has identified climate change as one of the major threats to national park units and has developed a *Climate Change Response Strategy*, the *2012-2014 Climate Change Action Plan,* and *A Green Parks Plan* to identify tools and techniques to help address these challenges within the national park system. Strategies identified in these plans will help the National Park Service implement the US Department of the Interior's *Secretarial Order 3289: Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources*, which requires all agencies under its auspices to consider and analyze potential climate change impacts when undertaking long-range planning (US Department of the Interior 2009).

Two different issues must be considered with respect to climate change: (1) the contribution of the proposed project to climate change, as indicated by greenhouse gas emissions associated with the project; and (2) the anticipated effects of climate change on Lake Mead NRA's resources, and specifically, the resources that would be impacted by the project.

In addressing the first issue, greenhouse gas emissions from vehicular traffic on US Highway 93, the surrounding area, and the bypass project were analyzed in the 2005 EIS. The impairment determination prepared by Lake Mead NRA states that Class II air quality standards for emissions would not be exceeded and air quality would remain close to current levels. Therefore, issuing a special use permit to allow for relocation of the transmission line, using existing and grading of new access roads, and installing a temporary waterline to support construction of the bypass project are not likely to have any meaningful effects on the rate and magnitude of climate change.

With regard to the second issue, climate change has the potential to adversely affect future resource conditions within Lake Mead NRA, specifically in water bodies such as Lake Mead and the Colorado River. As described in "Chapter 4: Environmental Consequences," persistent drought has and is expected to continue to result in decreasing water levels in Lake Mead. The National Park Service, water authorities, and their partners are working to address this issue through a variety of measures, including amendments to planning documents and efforts to construct a new water intake system. The removal of water from Lake Mead over a three year period to support construction activities within Lake Mead NRA associated with the bypass project would have no appreciable effect on the lake level. Therefore, water removal would not contribute to climate change effects on NPS resources and thus, this topic was dismissed from further analysis.

RELATIONSHIP TO LAWS, EXECUTIVE ORDERS, AND POLICIES

LAKE MEAD NATIONAL RECREATION AREA ENABLING LEGISLATION

The construction of Boulder Dam (now called Hoover Dam) was undertaken by the US Bureau of Reclamation in the early 1930s. In recognition of the enormity of administering recreation and leisure opportunities that would be available when Lake Mead filled with water and managing natural and cultural resources present in the area, the US Bureau of Reclamation entered into a joint use agreement with the National Park Service in October 1936 to establish the Boulder Dam NRA. The joint use agreement was reauthorized in July 1947 and less than one month later Boulder Dam NRA was redesignated as Lake Mead NRA. This designation was not formalized until October 8, 1964, when Lake Mead NRA was established as a unit within the national park system under Public Law 88-639 (78 Stat. 1039).

Approximately 3,000 square miles of lake and desert was included in the formal designation in 1964. The recreation area shares a boundary with Grand Canyon National Monument, and in 1974, the approximately 90 square miles of the westernmost part of the Grand Canyon was transferred from Lake Mead NRA to Grand Canyon National Monument (NPS 2014a).

The enabling legislation states that the recreation area

> shall be administered by the Secretary of the Interior for the general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area…(Government Printing Office n.d.)

Permitted activities identified in the enabling legislation include general recreation use, grazing, mineral leasing, vacation cabin use in accordance with applicable Department of the Interior policies, hunting, fishing, and trapping. The enabling legislation further states

> all lands in the recreation area which have been withdrawn or acquired by the United States for reclamation purposes shall remain subject to the primary use thereof for reclamation and power purposes so long as they are withdrawn or needed for such purposes (Government Printing Office n.d.).

APPLICABLE FEDERAL AND STATE LAWS

National Park Service Organic Act of 1916

The National Park Service and its mandates are authorized under the Organic Act (16 United States Code [USC] 1, 2-4) and the General Authorities Act (16 USC 1a-8). These acts direct the agency to conserve the scenery, natural and historic objects, and wildlife, and to provide for the enjoyment of those resources in such a manner as to leave them unimpaired for future generations.

Redwood National Park Act of 1978, as Amended

Amending the Organic Act, the Redwood Act (March 27, 1978, 16 USC 1a-1) further defines that the National Park Service may not allow degradation of the values and purposes for which the various areas were established unless authorized by Congress. This act also affirms that if a conflict occurs between visitor use and protection of resources, the intent of Congress is to favor resource protection.

National Environmental Policy Act of 1969, as Amended

The National Environmental Policy Act was passed by Congress in 1969 to establish environmental policies, including the goal of achieving productive harmony between human and physical environments for present and future generations. It provides the tools to implement these goals by requiring every federal agency to conduct an in-depth study of potential impacts of "major federal actions having a significant effect on the environment" and alternatives to those actions. The act is implemented through the Department of the Interior's regulations 43 CFR part 46 and the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) (CEQ 1978). The National Park Service has adopted procedures to comply with the National Environmental Policy Act. These procedures are found in Director's Order 12 (NPS 2001) and its accompanying handbook.

National Parks Omnibus Management Act of 1998

This act outlines a strategy to improve the ability of the National Park Service to provide high-quality resource management, protection, interpretation, and research in the national park system.

Endangered Species Act of 1973, as Amended

The Endangered Species Act of 1973 (ESA) (16 USC 1531, et seq.) requires the National Park Service to promote the conservation and recovery of federally listed species and their habitats. It also requires an evaluation of the effects of proposed actions on all federally listed species, including threatened, endangered, and those proposed for listing and their designated Critical Habitat. Any activity funded by federal monies with the potential to adversely affect ESA-listed species must be formally consult with the secretaries of the US Department of the Interior or Department of Commerce, depending on the species affected. Although not required by law, it also is NPS policy to identify, preserve, and restore state and locally listed species of concern and their habitats.

Clean Air Act of 1970, as Amended

The Clean Air Act (CAA) is the primary federal law that regulates air pollutant emissions from stationary sources (e.g., industrial facilities, power plants) and mobile sources (automobiles, trucks, locomotives, and marine vessels). Among other things, the Clean Air Act authorizes the US Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare, permitting programs for certain major emission sources, and technology-based standards to regulate emissions of hazardous air pollutants. The Clean Air Act and associated implementing regulations provide the framework for identifying areas that do not meet the National Ambient Air Quality Standards and requiring states to develop plans to ensure air quality standards are met in the future. The General Conformity requirements of the Clean Air Act require that federal agencies ensure their actions are not inconsistent with plans for improving air quality in nonattainment (areas not meeting the National Ambient Air Quality Standards) and maintenance areas (former nonattainment areas). The Clean Air Act also includes a Prevention of Significant Deterioration program to protect air quality and visibility in relatively clean areas, with the highest degree of protection afforded to designated "Class I" areas (which include national parks in excess of 6,000 acres that were in existence as of August 7, 1977) (USEPA 2014a, NPS 2011).

Clean Water Act of 1972, as Amended

The Clean Water Act of 1972, as amended establishes the basic structure for regulating discharges of pollutants into the waters of the United States and establishing water quality standards for surface waters. Under the Clean Water Act, the US Environmental Protection Agency and Nevada Department of Environmental Protection have implemented pollution control programs including the establishment of wastewater standards for industry and contaminants in surface waters. Under the Clean Water Act, the unauthorized discharge of pollutants from point sources into navigable waters is illegal. As a result, the US Environmental Protection Agency established the National

Pollutant Discharge Elimination System to regulate discharges. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters (USEPA 2014b).

National Historic Preservation Act of 1966, as Amended

The National Historic Preservation Act (16 USC 470 et seq.), establishes as federal policy that the historical and cultural foundations of the nation's heritage be preserved. Section 106 requires that federal agencies that have direct or indirect jurisdiction over undertakings take into account the effect of those undertakings on cultural resources eligible for or included on the National Register of Historic Places (national register). This section also provides for the Advisory Council on Historic Preservation and state historic preservation officer to issue a determination of effect based on the extent of potential impacts. The 1992 amendments to the act further define the roles of Native American tribes and the affected public in the consultation process.

Archeological Resource Protection Act of 1979

The Archeological Resource Protection Act of 1979 protects archeological resources and sites on public and Indian lands, and fosters increased cooperation and exchange of information among government authorities, the professional archeological community, and private individuals having collections of archeological resources and data that were obtained before October 31, 1979.

The act defines archeological resources as any material remains of past human life that are at least 100 years old and are of scientific interest. With penalties for violators, it requires federal permits for the excavation and removal of artifacts and materials and related data having to do with archeological survey and excavation records. It provides for the confidentiality within the federal agency of archeological site locations, information that the agency is not to share with the public. It encourages cooperation with other parties to improve and increase the protection of archeological resources. Amended in 1988, it requires the development of plans for surveying public lands and for recording and reporting incidents of suspected violations.

Native American Graves Protection and Repatriation Act of 1990

This act provides for consultation and repatriation of cultural items (human remains, funerary objects, sacred objects, or objects of cultural patrimony) to culturally affiliated Indian tribes. This act also provides for any intentional or inadvertent discoveries of cultural items within Lake Mead NRA to be protected and consultation with affiliated Indian tribes to be initiated.

Native American Religious Freedom Act of 1979

This act is intended to protect and preserve the freedom to believe, express, and exercise the traditional religions of American Indians and provide access to sites, use, and possession of sacred objects, as well as the freedom to worship through ceremonials and traditional rites.

OTHER APPLICABLE EXECUTIVE ORDERS, REGULATIONS, AND POLICIES

National Park Service Management Policies

NPS *Management Policies 2006* (NPS 2006) state the "fundamental purpose" of the national park system is to conserve park resources and values and to provide for the public enjoyment of the parks resources and values so resources will be left unimpaired for future generations. Section 5.3.5 of NPS *Management Policies 2006* establishes the framework for considering cultural resources in planning efforts (NPS 2006).

Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making and Handbook

Director's Order 12 and its accompanying handbook (NPS 2001) lay the groundwork for how the National Park Service complies with the National Environmental Policy Act. Director's Order 12 and the handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects.

Director's Order 28: Cultural Resource Management

Director's Order 28 directs the National Park Service to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principals contained in NPS *Management Policies 2006*. Director's Order 28 is carried out through the NPS 28: Cultural Resource Management Guideline that provides the fundamental concepts of cultural resource management for the National Park Service. While general archeological requirements are included under Director's Order 28, Director's Order 28A: Archeology and its reference manual provide more specific guidance on selected archeological topics. They provide the necessary information to implement those laws and policies applicable when carrying out certain activities and promote a common framework for planning, reviewing, and undertaking archeological activities and other activities that may affect archeological resources within the national park system.

Under the NPS' Archeology Program, 36 CFR 79 establishes definitions, 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 (16 USC 431- 433), the Reservoir Salvage Act (16 USC 469-469c), section 110 of the National Historic Preservation Act (16 USC 470h-2), or the Archaeological Resources Protection Act (16 USC 470aa-mm) (Government Printing Office n.d.).

Director's Order 77: Natural Resource Management

Director's Order 77 addresses natural resource protection with specific guidance provided in Reference Manual 77: *Natural Resource Management.* This manual offers comprehensive guidance to NPS employees responsible for managing, conserving, and protecting the natural resources found in national park system units.

Executive Order 11593: Protection and Enhancement of the Cultural Environment

This Executive Order stipulates that the federal government provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation. Federal agencies are required to: (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archeological significance are preserved, restored, and maintained for the inspiration and benefit of the people, and (3) in consultation with the Advisory Council on Historic Preservation (16 USC 470i), 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 archeological significance.

Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This Executive Order requires that agencies establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, to strengthen the US government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates on Indian tribes (CEQ 2000).

Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation

The planning standards discuss identifying, evaluating, registering, and treating historic properties, while the remaining activity standards consider how each activity should be carried out. The standards outline a process that determines when an area should be examined for historic properties, whether an identified property is significant, and how a significant property should be treated. The process it outlines is flexible enough to be used at all levels while providing a common structure that promotes coordination and minimizes duplication of effort. The professional qualifications standards discuss the education and experience required to carry out various activities, and contain additional information about how to integrate various levels of planning (NPS n.d. [a]).

Secretary of the Interior's Standards for the Treatment of Historic Properties, Guidelines for the Treatment of Cultural Landscapes

This document provides guidance to cultural landscape owners, stewards and managers, landscape architects, preservation planners, architects, contractors, and project reviewers prior to and during the planning and implementation of project work. These standards can be applied to all historic resource eligible or listed on the national register including buildings sites, objects, and districts. The guidelines establish the foundation for preserving, rehabilitating, restoring, and reconstructing resources in a way that is consistent with the standards. These standards are used to ensure that projects receiving federal money or tax benefits are reviewed in a consistent fashion nationwide (NPS n.d. [b]).

CHAPTER 2: ALTERNATIVES

INTRODUCTION

CEQ regulations for implementing the National Environmental Policy Act require federal agencies to consider a range of alternatives and fully evaluate all reasonable alternatives that address the purpose of and need for the action. Alternatives under consideration must include a no-action alternative in accordance with CEQ regulations (40 CFR 1502.14). Action alternatives may originate from the proponent agency, local government officials, or members of the public. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

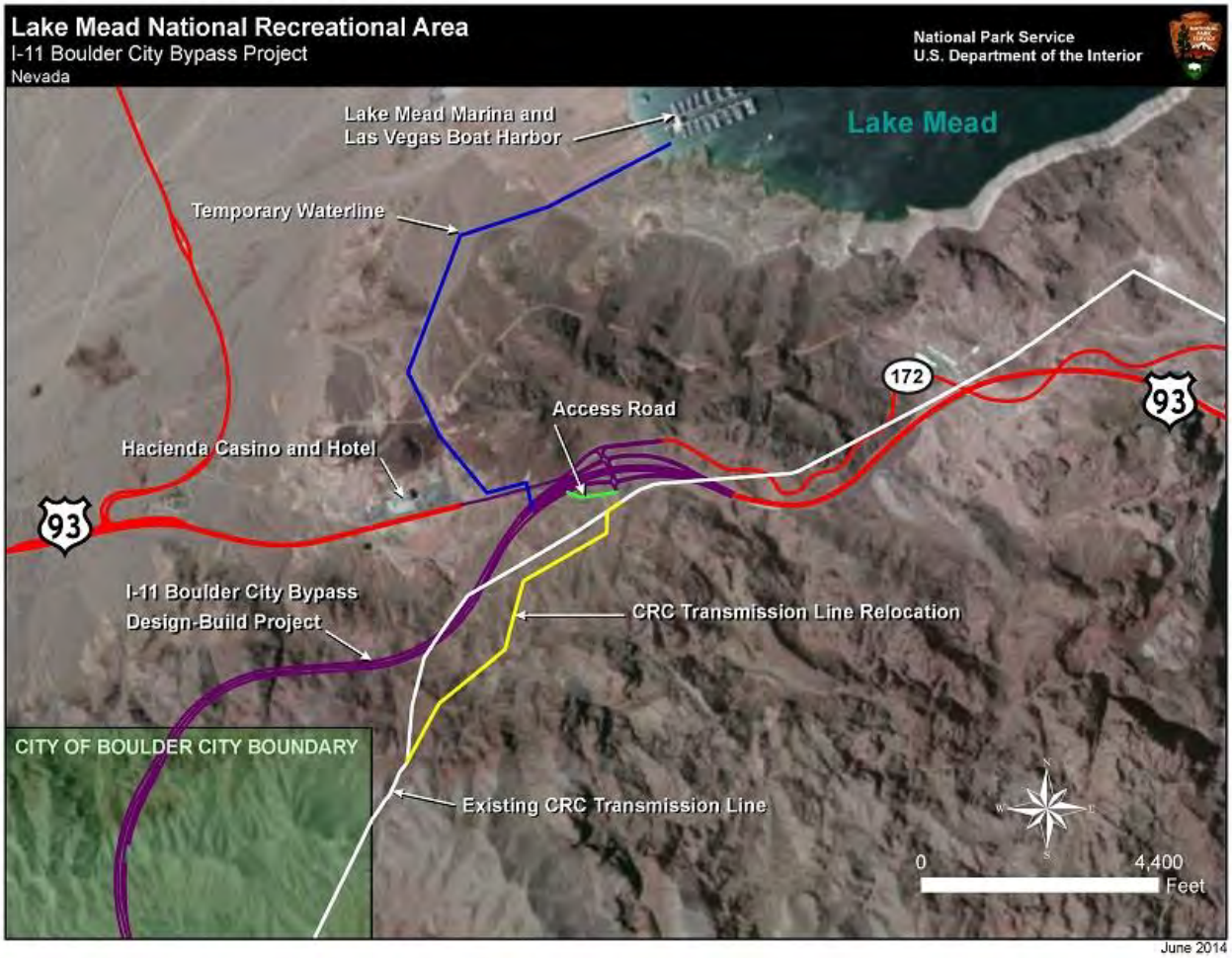
The action alternative analyzed in this environmental assessment was developed based on design refinements for the bypass project and mitigation measures identified in the 2005 EIS. The alternatives include the no-action alternative and one action alternative, which are described in greater detail below. This chapter also describes alternatives or elements of alternatives that were considered but dismissed from further analysis, identifies mitigation measures and the environmentally preferable and NPS preferred alternatives, and summarizes potential impacts by alternative and resource topic.

NO-ACTION ALTERNATIVE

The no-action alternative is defined as the continuation of current policies and management actions in Lake Mead NRA. The National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada and, subsequently, those elements identified as part of the special use permit would not occur within Lake Mead NRA. This could require a reconsideration of the bypass project design, construction access, and ability to use water from Lake Mead to meet mitigation requirements.

ALTERNATIVE 1 (ACTION ALTERNATIVE): ISSUANCE OF A SPECIAL USE PERMIT

This alternative provides for the issuance of a special use permit by the National Park Service to the Regional Transportation Commission of Southern Nevada to support specific elements of the bypass project. The three elements associated with the special use permit include: (1) the relocation of approximately 1 mile of an existing transmission line; (2) the use of unpaved backcountry roads to access construction staging areas; and (3) the installation of a temporary waterline to support construction mitigation. Figure 2 demonstrates the three project elements associated with the request for a special use permit. These project elements are described in greater detail in the following section.

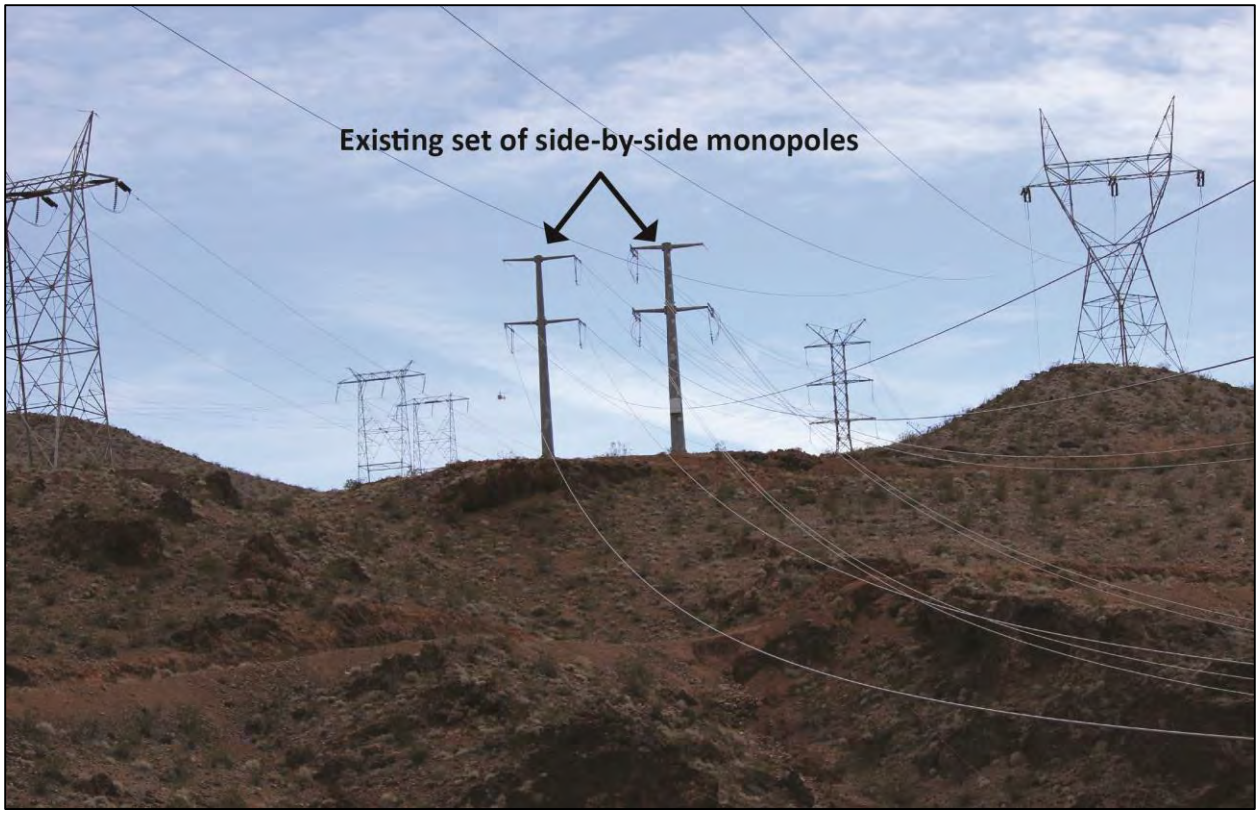


Source: Louis Berger

FIGURE 2. PROJECT ELEMENTS ASSOCIATED WITH THE SPECIAL USE PERMIT

TRANSMISSION LINE RELOCATION

To construct the bypass project in its current design alignment, approximately 1 mile of the CRC's existing Mead-Eastside/Equestrian #2 transmission line would need to be relocated outside of the bypass project's right-of-way. This portion of the transmission line includes 3 transmission lattice towers and 5 sets of side-by-side monopoles, 10 monopoles in total. Figure 3 shows a single set of side-by-side monopoles that are part of the existing transmission line.



Source: NPS

FIGURE 3. EXISTING TRANSMISSION LINE TO BE PARTIALLY RELOCATED

The removed sets of monopoles would be replaced with 22 tubular steel monopoles configured as 11 sets of side-by-side monopoles, in an area extending approximately 1.2 miles south from the Hoover Dam/Nevada interchange at SR 172 and approximately 500 feet to 1,000 feet to the east within an existing transmission line corridor. The relocated CRC transmission line would be sited between two existing Western Area Power Administration transmission lines. As part of the special use permit, the National Park Service would amend the existing CRC 125-foot-wide easement to accommodate the new alignment.

Based on prior site work, the realignment of the transmission line has been designed to minimize the number of structures requiring relocation and the time and duration of service disruptions that would result from realignment construction. The proposed realignment of the transmission line has also been designed, in part, to allow for the use of an existing transmission line maintenance road within Lake Mead NRA to access construction areas, to the extent feasible. The Colorado River Commission conducted prior site work and designed the relocated transmission line.

The 22 new tubular steel monopoles would range from between approximately 4 feet to 6 feet in diameter at the base—resulting in the removal of approximately 0.014 acre—and 65 feet and 135 feet in height. Heavy material haul trucks would transport all necessary equipment to a nearby construction staging area within Lake Mead NRA, where the new poles would be assembled. Poles would be moved to the area where they would be sited via the existing unpaved transmission line

maintenance road, new access roads, or by helicopter in areas where the terrain is too step to accommodate the movement of heavy material haul trucks. The proposed construction staging areas were evaluated in sufficient detail in the 2005 EIS, and therefore, are not analyzed in this environmental assessment.

Three 20-foot-wide new access roads would be necessary to support construction and periodic maintenance of the transmission line in areas with moderate terrain where no such access currently exists. In total, approximately 600 linear feet would be necessary. It is anticipated that the Colorado River Commission would grade the identified alignments to support the movement of heavy material haul trucks. These dirt roads would be permanent to provide access during periodic maintenance activities.

During construction activities, the disturbance of a circular area approximately 50 feet in diameter would be required to support the installation of each new set of side-by-side poles. Auguring equipment would be used to create the shafts in which individual poles would be sited. The installation of some tubular steel monopoles would require drilled shaft concrete foundations for stability, whereas others could be directly embedded (placed into a pre-dug hole and then backfilled with the excavated soil). To facilitate the stringing of the transmission line, two 40-foot by 80-foot conductor pulling sites would be used, totaling 0.15 acre.

After the portion of the transmission line to be relocated is taken out of service, the three transmission lattice towers and five sets of side-by-side monopoles would be removed to the ground level using heavy construction equipment. Affected areas would be reclaimed. These actions and those identified above would be outlined in a construction action plan developed by the Colorado River Commission and approved by the National Park Service prior to the onset of construction activities. Construction activities are anticipated to last between three and six months.

Once in operation, permanent features within Lake Mead NRA would include the 22 new tubular steel monopoles, overhead conductors, and other supporting infrastructure. Periodic maintenance activities may require that equipment trucks and/or other maintenance vehicles be brought onsite.

ACCESS ROAD USED DURING CONSTRUCTION AND PERIODIC MAINTENANCE

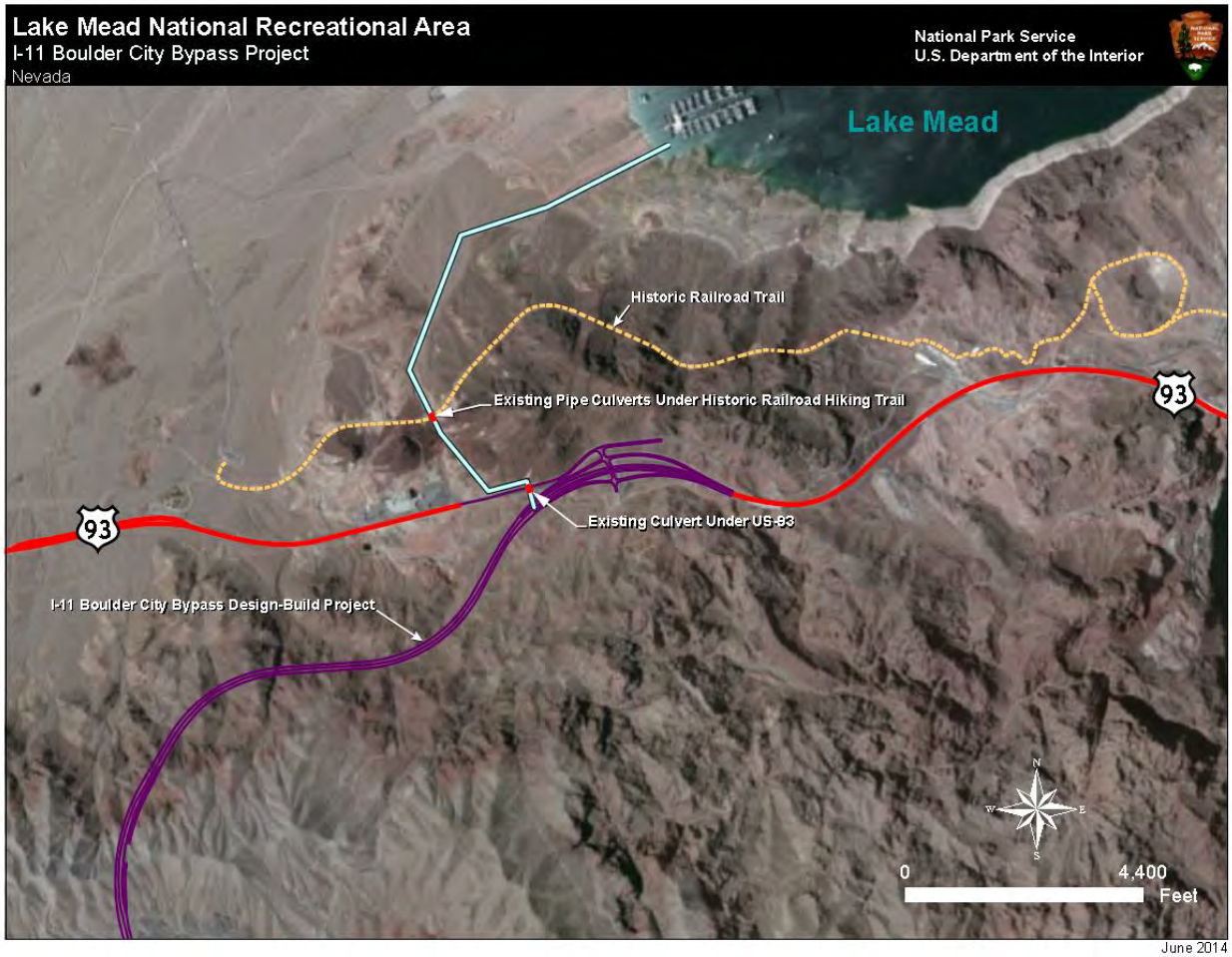
An existing 20-foot-wide unpaved transmission line maintenance road extends from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-of-way, south of the interchange. The 0.5-mile road is located within Lake Mead NRA. Equipment necessary to support the relocation of the transmission line would be brought onsite using this road. The road would also be used as an access point for construction of portions of the relocated transmission line that would be adjacent to the road. In addition, the road would be used to provide access to the freeway right-of-way to support construction of the bypass project. An estimated 50 truck trips per day would occur over the three-year construction period.

INSTALLATION OF A TEMPORARY WATERLINE TO SUPPORT CONSTRUCTION ACTIVITIES

The 2005 EIS identified dust suppression as a mitigation measure that would be implemented during construction of the bypass. As a result, the proposed project would include the installation of a temporary waterline to extend from Lake Mead to the bypass project construction staging areas for dust suppression, processing excavated materials, and compaction of embankment material. The bypass project in its entirety would require approximately 6 million cubic yards of rock excavation, of which approximately 2 million cubic yards would be within Lake Mead NRA. At this time, the Regional Transportation Commission of Southern Nevada proposes that the waterline—which would be made of high density polyethylene—run from Horsepower Cove of Lake Mead to the bypass project's right-of-way south of US Highway 93, east of the Hacienda Hotel and Casino, and west of the US Highway 93/Hoover Dam interchange at SR 172.

The approximately 2-mile route for the waterline would be within a 30-foot right-of-way. The proposed alignment would be aboveground and use existing drainages and culverts, including those that run under the Historic Railroad Trail and US Highway 93 (see figure 4). In Lake Mead, the waterline would be sited east of the Las Vegas Boat Harbor and Lake Mead Marina. The water intake and main pump for the waterline would be mounted on a floating barge, which could be moved to accommodate lowering lake levels if necessary. Overall, it is anticipated that the waterline would be sited to minimize or avoid areas frequented by visitors. The National Park Service would work with the Regional Transportation Commission of Southern Nevada to determine the exact alignment for the waterline.

The waterline would terminate within the bypass project's proposed right-of-way in an area south of US Highway 93 where the National Park Service has granted a highway deed to the Federal Highway Administration. The "means and methods" for use of construction water onsite would be largely determined at the time of construction. However, it is anticipated that a holding pond within the bypass project's proposed right-of-way near US Highway 93 would be created, and water would be transported to the construction site using by truck and/or pump. The National Park Service has entered into an agreement with the Regional Transportation Commission of Southern Nevada to provide construction oversight.



Source: Louis Berger

FIGURE 4. PROPOSED ALIGNMENT OF THE WATERLINE

The waterline—which would be 6 inches in diameter—would be laid on the surface of the ground following the identified alignment and would not require ground-disturbing activities. In limited locations, sandbags may be placed on top of the waterline to hold it in place. No permanent fill would be placed within waters of the United States.

To ensure the efficiency and effectiveness of the waterline, it is anticipated that an intake barge would be used to support pumping activities because water levels in Lake Mead are expected to continue to drop. While the intake barge would not be sited in a fish spawning area, an appropriate fish screen would be attached to the intakes to avoid fish entrainment.

In addition to the intake barge, between two and four intermediate 6-by-6 foot pumps would be intermittently sited adjacent to the waterline to pump water from Lake Mead to the construction staging area, which would be at a higher elevation. These pumps would be powered by gasoline generators that would be located at the intake barge and each pump. It is anticipated that the generators would run 24 hours per day during peak construction periods. In total, the generators would average 16 hours per day for approximately 300 days per year.

The waterline would be constructed onsite and waterline materials would be brought to the area by heavy material haul truck. Existing access roads and/or dry wash areas would be used to access the waterline; no new access and/or maintenance roads would be constructed to support the waterline. In areas where existing roads or wash areas are not available, the waterline would be constructed by hand, and the intermediate pumps would be lowered into position. It is anticipated that construction of the temporary waterline would take approximately two months; however, the waterline itself would be in operation for an estimated three years. The waterline would be removed and all affected areas would be reclaimed and restored once construction activities for the bypass project are complete. Reclamation and restoration activities would be implemented within one growing season following completion of the bypass project.

It has been estimated that approximately 200,000 to 300,000 gallons of water per day would be needed during specified periods throughout the estimated three-year construction period of the bypass project. Overall, an estimated 120,000,000 gallons of water from Lake Mead would be used over the construction period. Water taken from Lake Mead would be part of the NPS's allocation from the Colorado River and used exclusively within Lake Mead NRA.

MITIGATION AND MONITORING

A series of mitigation measures and monitoring activities that would be implemented during the transmission line relocation and other alternative elements associated with the special use permit have been identified. These measures and activities would only be implemented under the action alternative and are summarized in table 1 by resource topic.

TABLE 1. MITIGATION MEASURES FOR THE ACTION ALTERNATIVE: ISSUANCE OF SPECIAL USE PERMIT

Resource Impact Topic	Mitigation Measures
Soils	• Follow all applicable soil conservation measures listed in NPS Natural Resource Management Reference Manual #77. • Minimize ground-disturbing activities. • Develop and implement erosion and sediment control plans. • Limit road construction to the minimum amount necessary to safely move equipment, materials, and personnel in and out of the construction area. • Minimize construction on steep or unstable slopes. • Monitor erosion control best management practices (BMPs) during construction to ensure proper function. • Retain existing vegetation wherever possible to prevent sediment movement off site. • Install sediment barriers and other suitable erosion and runoff control devices prior to ground-disturbing activities at construction sites.
Vegetation	• Use BMPs to limit erosion and the spread of noxious weeds. • Clean all ground-disturbing equipment prior to entering Lake Mead NRA. Require inspection of all such equipment by an NPS representative prior to use. • Use appropriate NPS-approved seed mixes, application rates, and seeding dates to revegetate disturbed areas following completion of construction activities. • Salvage and replace any removed topsoil over disturbed areas upon completion of construction. • Cooperate with the National Park Service and other agencies as applicable to reduce the introduction and spread of noxious weeds, including locating vehicle wash or blow stations as appropriate to avoid the spread of noxious weeds. • Limit ground-disturbing activities to structure sites, access roads, and pulling sites. • Prepare and implement spill prevention and response procedures to avoid and contain accidental spills, including notification assessment, security, clean-up, and reporting requirements. • Consult with the U.S. Fish and Wildlife Service (USFWS), the National Park Service, and the Nevada Natural Heritage Program concerning any ESA-listed plant species or other species of special concern identified in the project corridor, and implement any mitigation measures (such as feasible and appropriate avoidance measures) identified as a result of these consultations.

TABLE 1. MITIGATION MEASURES FOR THE ACTION ALTERNATIVE: ISSUANCE OF SPECIAL USE PERMIT

Resource Impact Topic	Mitigation Measures
Fish and Wildlife and Their Habitats	• Conduct nesting bird surveys during the nesting season and establish buffers around active nests. Conduct surveys for desert tortoise and bats. If possible, conduct as much habitat disturbance from September to February. • Use a fish screen on the water pipe intake to prevent fish from being taken from the lake. • Use BMPs to reduce sedimentation to Lake Mead and the Colorado River. • Leave observed a fish or wildlife species alone. Do not feed or handle them. • Consult with USFWS to minimize impacts on the federally protected desert tortoise and follow all mitigation measures in the forthcoming Biological Opinion.
Water Resources	• Prepare a Stormwater Pollution Prevention Plan that identifies BMPs to be used to avoid or minimize any adverse effects of construction on surface waters and to protect channels from sediment input during construction. These BMPs could include the following: - Use silt fencing or other erosion control measures around stockpiled fill material. - Ensure proper storage, use, and disposal of fuels and other chemicals. - Install flags, markers, and/or temporary fences prior to construction activities to avoid soil disturbance outside of the work area. - Minimize access routes for construction vehicles to prevent trackout of sediments. - Trap sediment before it leaves the site, and stabilize disturbed areas as quickly as possible. • Comply with all provisions of the Nevada Revised Statutes, Chapters 533 and 534, regarding Nevada water rights and regulations. In addition, comply with all provisions of the Nevada Revised Statutes, Chapter 533, Adjudication of Vested Water Rights; Appropriation of Public Water, Chapter 534, Underground Water and Wells, and with the Nevada Administrative Code 445A Water Controls.
Air Quality	• Obtain Clark County dust control permit and comply with required dust control measures.
Soundscapes	• No sensitive noise receptors would be located near alternative elements; therefore, it is generally expected that no mitigation measures would be necessary. • Cover areas to be blasted by blasting pads to minimize noise and debris • Strategically place water pumps associated with the waterline to minimize noise impacts • Limit (generally) construction activities to daylight hours.

TABLE 1. MITIGATION MEASURES FOR THE ACTION ALTERNATIVE: ISSUANCE OF SPECIAL USE PERMIT

Resource Impact Topic	Mitigation Measures
Cultural Resources	• Use cultural resource monitors during construction activities as necessary to ensure previously identified and/or eligible archaeological sites are avoided, resulting in no adverse impacts. • Cease all work if previously unidentified cultural or archaeological resources are discovered, and consult the park archeologist to determine a course of action.
Visitor Use and Experience	• Initiate short-term area closures as necessary during construction to minimize potential visitor safety concerns. • Implement a public information plan to notify the public of project activities during construction of the project. • Implement a construction traffic control plan as necessary to mitigate traffic impacts on visitors.
Public Health and Safety	• Conduct soil sampling in areas along the proposed transmission line right-of-way reasonably likely to contain asbestos. • Comply with all worker safety provisions in 1926.1101, the Occupational Safety and Health Administration's respiratory standard (CFR 1910.134), and other standards during disturbance of geologic materials. • Prepare and implement spill prevention and response procedures to avoid and contain accidental spills, and prepare and implement worker safety protocols. • Provide spill prevention kits at designated locations on the project site and where hazardous materials are stored. • Require contractor training for safety protocols and spill prevention and response procedures. • Inspect equipment daily for potential leaks. • Develop and implement an approved Asbestos Compliance Plan and Asbestos Dust Mitigation Plan.

ALTERNATIVES OR ALTERNATIVE ELEMENTS CONSIDERED BUT DISMISSED FROM FURTHER EVALUATION

As noted above, the RTC's request for a special use permit is the result of design refinements associated with the relocation of approximately 1 mile of the CRC's existing Mead-Eastside/Equestrian #2 transmission line and mitigation measures identified in the 2005 FEIS for the bypass project. The relocation of the transmission line was evaluated in the 2005 FEIS, although in a slightly different location, and subsequently, other alternatives or alternative elements that evaluated how the bypass project and transmission line would intersect in this area were considered but dismissed from further evaluation at that time.

Other alternatives or alternative elements that were considered but dismissed from further evaluation as part of the request for a special use permit are described below. However, because the request for a special use permit is the result of actions or mitigation measures identified in the 2005 EIS for the bypass project, few alternatives or actions associated with the special use permit have been identified.

RAISING THE COLORADO RIVER COMMISSION'S TRANSMISSION FACILITIES

To raise the existing portion of the transmission line proposed for relocation within the present easement to provide adequate vertical clearance over the bypass project would also require raising two Western Area Power Administration transmission lines that are above the existing CRC transmission line. Raising the Western Area Power Administration's transmission lines was not considered feasible because they are already historical lattice tower structures at their vertical limit. In addition, raising the existing CRC transmission facilities in their current alignment would require the construction of new maintenance roads that would cause additional land disturbance rather than making best use of existing maintenance roads. Therefore, this alternative element was dismissed from further evaluation.

USE OF TRUCKS TO TRANSPORT WATER FROM LAKE MEAD OR BOULDER CITY TO CONSTRUCTION STAGING AREAS

The use of trucks to transport water from Lake Mead to one of the bypass project's construction staging areas was considered as an alternative to the waterline. The removal of 200,000 to 300,000 gallons of water per day during specified periods would require an estimated 100 daily truck trips. An alternative to this would be to collect water from fire hydrants in Boulder City and transport water via truck to construction staging areas, which would also require an estimated 100 truck trips during peak periods. Both alternative elements would increase noise and vehicular emissions and slow non-construction-related vehicles on affected roadways, all of which would adversely affect visitor use and experience. Additional equipment would be needed to move water from Lake Mead onto

trucks. The introduction of the waterline would result in fewer adverse effects than the use of trucks to transport water. Therefore, this alternative element was dismissed from further evaluation.

WATERLINE RUNNING FROM THE WASTERWATER TREATMENT FACILITY IN BOULDER CITY TO CONSTRUCTION STAGING AREAS

One million gallons per day of reclaimed water is available from the Boulder City Wastewater Treatment Facility for construction use for the bypass project. However, the wastewater treatment facility is located more than 7 miles from the Lake Mead NRA boundary. Reclaimed water would need to be pumped and raised 500 vertical feet to cross over the ridge of the Eldorado Mountains to be used within Lake Mead NRA. The waterline described under the action alternative would also require water to be pumped 500 vertical feet; however, the distance the water would need to travel to the construction site under the action alternative would be approximately 5 miles shorter than the distance from the wastewater treatment facility. In addition, the daily water allocation from the wastewater treatment facility is insufficient to meet the total need for construction water associated with the bypass project. Therefore, this alternative element was dismissed from further evaluation.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The National Park Service is required to identify the environmentally preferable alternative in its NEPA documents. The National Park Service, in accordance with the Department of the Interior's NEPA Regulations (43 CFR Part 46) and CEQ's Forty Questions, defines the environmentally preferable alternative (or alternatives) as the alternative that best promotes national environmental policy as expressed in the National Environmental Policy Act (Section 101(b)) (516 DM 4.10). CEQ's Forty Questions (Q6a) further clarifies the identification of the environmentally preferable alternative(s) as the alternative that best satisfies the following:

- fulfills the responsibilities of each generation as trustee of the environment for succeeding generations
- assures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings
- attains the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences
- preserves important historic, cultural, and natural aspects of our national heritage, and maintains, wherever possible, an environment which supports diversity and variety of individual choice
- achieves a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities
- enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources

The no-action alternative has been identified as the environmentally preferable alternative. Under the no-action alternative, the National Park Service would not issue a special use permit and subsequently, short-term impacts associated with the relocation of the transmission line and use of existing access roads and construction of new access roads would not occur. Additionally, the Regional Transportation Commission of Southern Nevada would be required to find an alternative water source for dust suppression, processing of excavated materials, and compaction of embankment material. As a result, natural resources within Lake Mead NRA would not experience short-term impacts associated with the issuance of a special use permit.

NATIONAL PARK SERVICE PREFERRED ALTERNATIVE

The NPS preferred alternative is the alternative that the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. As described in "Chapter 1: Purpose of and Need for Action," the National Park Service served as a cooperating agency throughout the planning process for the bypass project and authorized the use of this part of Lake Mead NRA to support the bypass project. The bypass project has been designed to reduce traffic congestion, increase safety, and improve regional mobility, which would benefit visitors to Lake Mead NRA and other users of the corridor.

Because the National Park Service previously authorized the use of the part of Lake Mead NRA to support the bypass project and impacts associated with the special use permit would be minimal, it has identified the action alternative as the NPS preferred alternative.

COMPARISON OF IMPACTS

Table 2 includes a summary of potential impacts on resource topics that were carried forward for further evaluation in this environmental assessment. "Chapter 4: Environmental Consequences" provides a detailed discussion of potential impacts associated with the action and no-action alternatives.

TABLE 2. IMPACTS OF PROJECT ALTERNATIVES

Resource Impact Topic	No-Action	Action Alternative (Preferred Alternative)
Soils	None	Short-term and long-term, negligible to minor, adverse
Vegetation	None	Localized, short-term, negligible to moderate, adverse and localized, long-term, negligible to moderate, adverse
Fish and Wildlife (listed and non-listed species) and their Habitats	None	Localized, short and long-term, none to minor, adverse impacts and localized, long-term, negligible, adverse
Water Resources	None	Localized, short and long-term, negligible to minor, adverse impacts and localized, long-term, negligible, adverse
Air Quality	None	Short-term, minor, adverse and long-term, negligible, adverse
Soundscapes	None	Short-term, minor to moderate, adverse and long-term, negligible, adverse
Cultural Resources	None	Short-term and long-term, negligible, adverse
Visitor Use and Experience	None	Short-term and long-term, minor, adverse
Public Health and Safety	None	Short-term, negligible to minor, adverse

CHAPTER 3: AFFECTED ENVIRONMENT

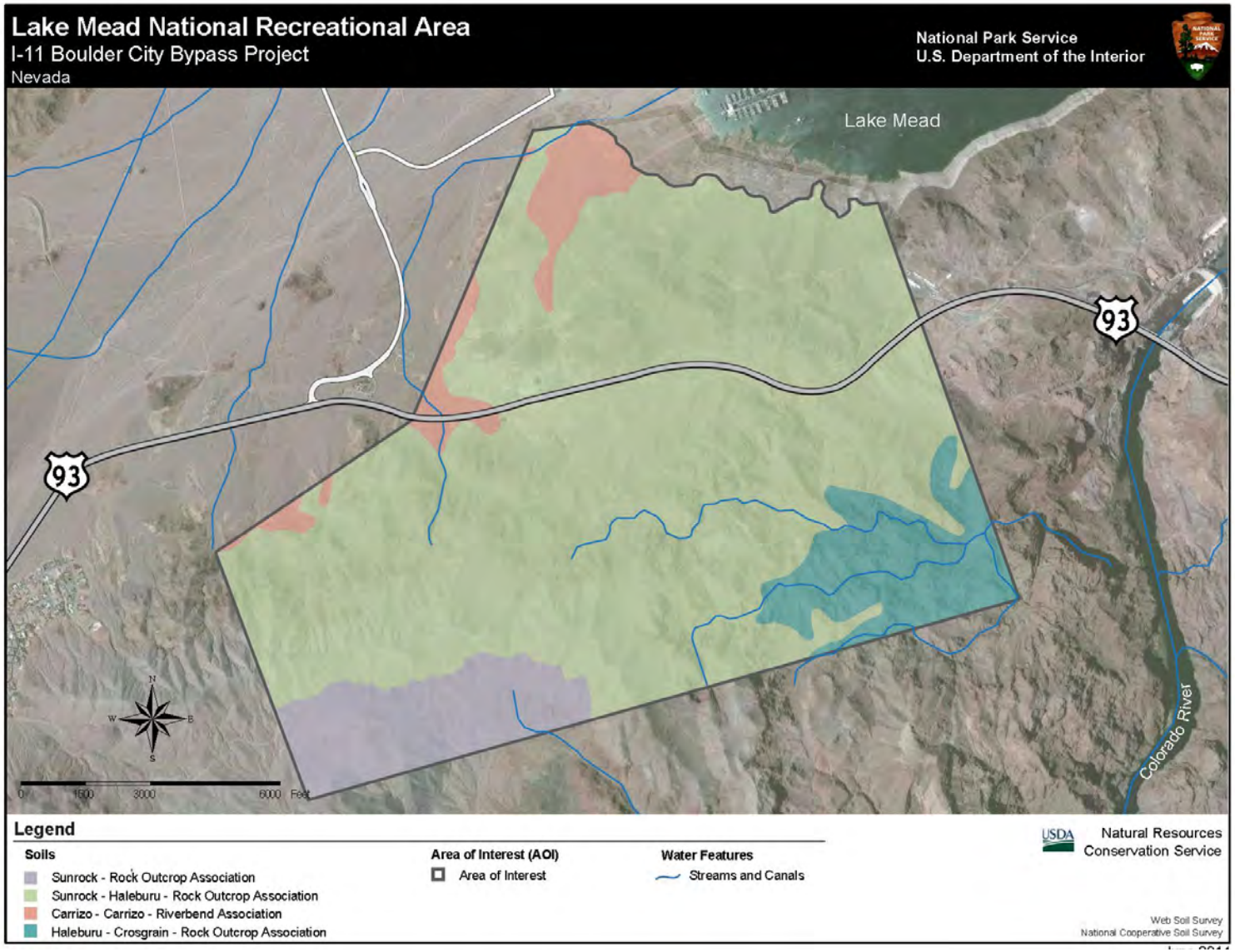
This chapter describes the current condition of resources within Lake Mead NRA that would be affected by project alternatives. The study area for each resource topic is generally defined as the area shown in figure 1. This chapter includes a detailed description of the following resource topics: soils, vegetation, fish and wildlife and their habitats, water resources, air quality, soundscapes, cultural resources, visitor use and experience, and public health and safety. Potential impacts are discussed in the same order in "Chapter 4: Environmental Consequences."

SOILS

Soil types are classified by a complex taxonomy that includes soil associations, series, and phases. Soil associations, which represent the largest and most general classification, are landscapes that have a distinctive proportional pattern of soils that have been named for the major soil types they represent. They generally consist of one or more major and at least one minor soil series. A soil series is a collection of soils that have major layers similar in thickness, arrangement, and other important characteristics, but may differ in surface layer texture. Each soil series is named for a town or other geographic feature near the location where it was first observed and mapped. Soil phases are more detailed classifications that differentiate soils of the same series based on characteristics that affect the use of the soils, such as the texture of the surface soil, slope, or stoniness (NRCS 1999).

Lake Mead NRA and the study area are located within the Great Basin and Mojave Desert sections of the Basin and Range Physiographic Province. The landscape of the Basin and Range Province is typified by isolated mountain ranges rising abruptly from broad, alluvium-filled desert basins (NRCS 2006). The study area and the western portion of Lake Mead NRA overall are generally characterized by north-south trending mountain ranges separated by broad, shallow valleys. The mountains are dissected by deep ravines opening into broad alluvial fans. Adjoining fans commonly coalesce and form a continuous alluvial apron along the base of the mountains. The underlying strata of this area primarily consist of Tertiary and Quaternary deposits (NPS 1991).

Soils in the study area include the Sunrock-Haleburu-Rock Outcrop, Haleburu-Crosgrain-Rock Outcrop, Sunrock-Rock Outcrop, and Carrizo-Carrizo-Riverbend associations (see figure 5). These soils are described in greater detail below and summarized in table 3.



Source: NRCS 2014
Note: Study area does not meet the edge of Lake Mead due to drop in water levels.

FIGURE 5. SOILS IN THE STUDY AREA

TABLE 3. SOILS IN THE STUDY AREA

Soil Type	Slope (%)	Drainage	Permeability	Flooding Hazard	Erosion Hazard	Runoff	Depth
Sunrock-Haleburu-Rock Outcrop association	8-75	Well drained	Moderately rapid	None	Moderate	Very high	Shallow
Haleburu-Crosgrain-Rock Outcrop association	8-50	Well drained	Moderately rapid	None	Moderate	Very high	Shallow
Sunrock-Rock Outcrop association	15-75	Well drained	Moderately rapid	None	Moderate	Very high	Shallow
Carrizo-Carrizo-Riverbend association	2-15	Excessively drained	Rapid to very rapid	Rare to frequent	Low to moderate	Low to negligible	Very deep

Source: NRCS 2006, 2014

SUNROCK-HALEBURU-ROCK OUTCROP ASSOCIATION

The Sunrock-Haleburu-Rock Outcrop association consists of shallow to very shallow, well-drained, moderately to steeply sloping soils that formed in colluvium and/or residuum weathered from volcanic rock. Permeability of these soils is moderately rapid with very high runoff and no frequency of flooding. Located on hills and mountains, these soils are typically used as rangeland (NRCS 2006).

HALEBURU-CROSGRAIN-ROCK OUTCROP ASSOCIATION

The Haleburu-Crosgrain-Rock Outcrop association consists of typically shallow to very shallow, well drained, moderately to steeply sloping soils that formed in colluvium and/or residuum weathered from volcanic rock. These soils are typically used as rangeland and are located on mountains (NRCS 2006).

SUNROCK-ROCK OUTCROP ASSOCIATION

The Sunrock-Rock Outcrop association consists of shallow to very shallow, well-drained, moderately to steeply sloping soils that formed in colluvium and residuum from volcanic rocks on mountains, hills, and mesas. Permeability of these soils is moderately rapid with very high runoff and no frequency of flooding. Located on hills and mountains, these soils are typically used as rangeland (NRCS 2006).

CARRIZO-CARRIZO-RIVERBEND ASSOCIATION

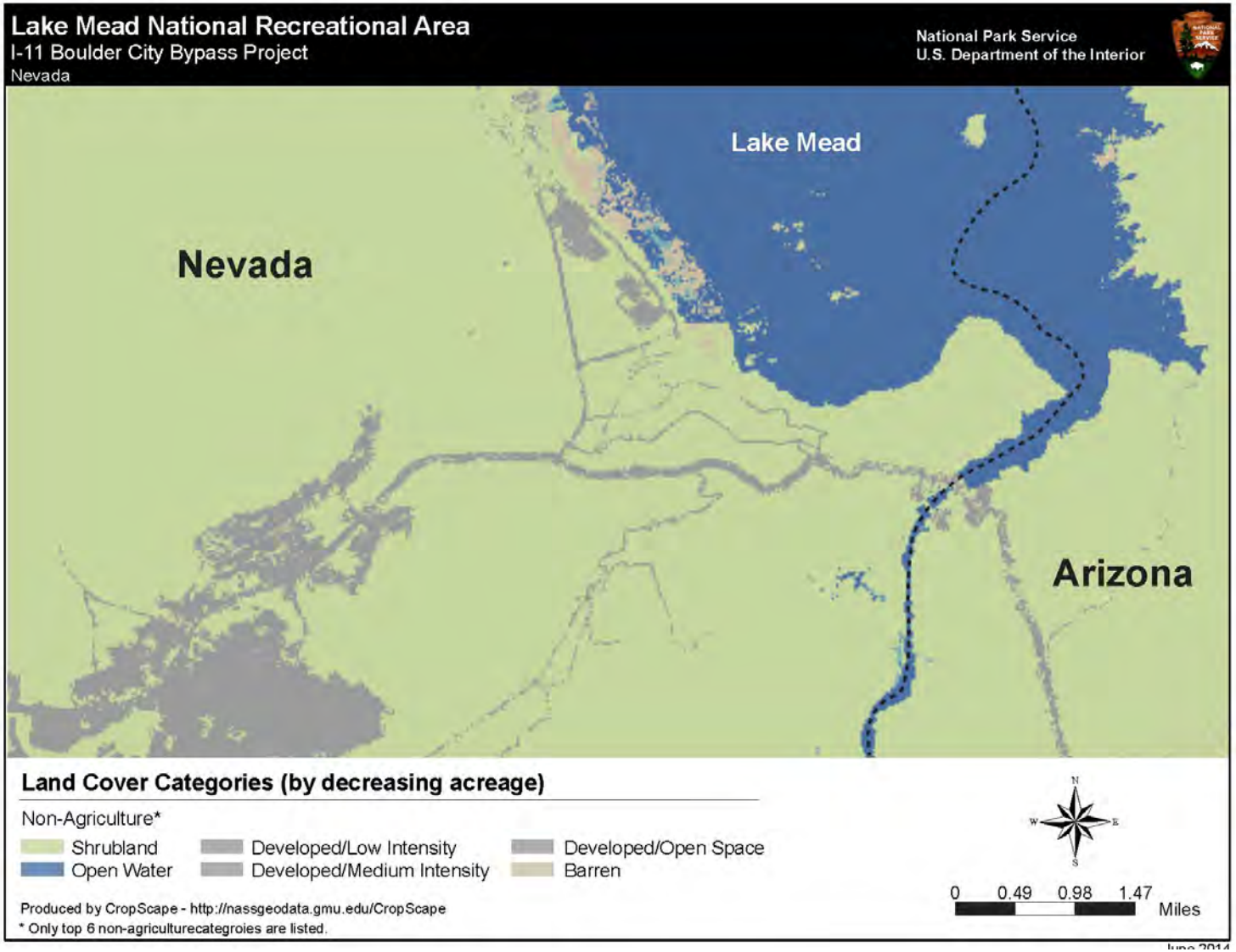
The Carrizo-Carrizo-Riverbend association consists of very deep, excessively drained, flat to moderately sloping soils that formed in mixed alluvium. These soils are in washes, drainageways, alluvial fans, and similar features. Permeability of these soils is rapid to very rapid with low to negligible runoff and flooding varies from rare to frequent depending on location. These soils are typically used as rangeland and are considered to have fair suitability as a source of sand and gravel (NRCS 2006). Naturally occurring amphibole asbestos mineral has been found in the bedrock and soils within the project area and vicinity. The source for this asbestos mineral appears to be coming from several plutons in southern Nevada and Arizona (Buck et al. 2013).

Geologic evaluation, sampling, and testing for naturally occurring asbestos was conducted for the area where existing transmission line towers are proposed to be removed as part of the construction of the proposed bypass project. This work involved four geotechnical core borings taken at depths ranging from 24 to 49 feet beneath the surface. Asbestos concentrations greater than 1% were measured in one of the borings (Kleinfelder 2014). Therefore, there is a potential for naturally occurring asbestos in soils within the project area.

VEGETATION

The study area is located in two ecoregions: (1) Creosote Bush-Dominated Basins and (2) Arid Valleys and Canyonlands. The Creosote Bush-Dominated Basins comprise the majority of the study area, while the Arid Valleys and Canyonlands ecoregion is located in a small area in the eastern part of the study area. The Creosote Bush-Dominated Basins ecoregion includes the valleys lying between the scattered mountain ranges of the Mojave Desert. The Arid Valleys and Canyonlands ecoregion includes steep canyons and benchlands below 2,000 feet in elevation near the Colorado River. This ecoregion is also one of the hottest and driest ecoregions in Nevada; it annually receives between 2 and 7 inches of rain (Bryce et al. 2003).

As figure 6 shows, the National Agricultural Statistics Service classifies all vegetated land cover types throughout the study area as shrubland. Vegetation in the study area is classified as the Creosote-Bursage association (Brown 1994). Observed dominant plant species documented during field surveys conducted within the study area in early 2014 included creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Less dominant species include silver cholla (*Cylindroputia echinocarpa*), pencil cholla (*Cylindropuntis ramossissima*), cheesebush (*Hymenoclea salsola*), and prickly pear (*Opuntia sp.*) (RTC 2014). A complete listing of plant species documented during the bypass project field surveys in May 2014 is found in "Appendix D: Plant Species Observed in the Bypass Study Area, May 2014."



Source: NASS 2013

FIGURE 6. LAND COVER IN THE PROJECT AREA

PROTECTED AND SENSITIVE PLANT SPECIES

The US Fish and Wildlife Service (USFWS) does not identify any ESA-listed endangered, threatened, candidate, or proposed plant species in the study area, nor does it identify Critical Habitat for any plant species in the general vicinity of the study area (USFWS 2014a).

During the preparation of the 2005 EIS, the Nevada Natural Heritage Program was consulted for records of protected and sensitive species occupying or using the proposed bypass project area. This consultation produced record of a single plant species of concern[1]—the rosy two-tone beardtongue, also known as bicolored penstemon (*Penstemon bicolor roseus)*. The bicolored penstemon possibly occurs in areas northwest of Boulder City; however, none were encountered at any point during surveys conducted in support of the 2005 EIS (FHWA 2005). The Nevada Natural Heritage Program (NNHP) continues to identify this species as at-risk in Nevada (NNHP 2014).

Consultation during the preparation of the 2005 EIS also indicated that habitat may be available for the Las Vegas bearpoppy (*Arctomecon californica)*, an NPS species of special concern (NPS 2014b), which is also protected under Nevada state law as critically endangered, and the silverleaf sunray (*Enceliopsis argophylla*), identified by the State of Nevada as at-risk (NNHP 2014) (table 4). No evidence of the bearpoppy or the silverleaf sunray, a species only known to grow in gypsum-rich soils, was noted along any of the bypass project's alignments evaluated in the 2005 EIS or in the 2014 Biological Assessment (NewFields 20104).

TABLE 4. POTENTIAL STATE SPECIES OF CONCERN IN THE STUDY AREA

Species	State Rank	Presence in Study Area
Las Vegas bearpoppy (*Arctomecon californica*)	**S3 (Vulnerable to decline because rare and local throughout its range, or with very restricted range)**	**Not believed to be present in study area This plant is restricted to eroded, gypsum-rich soils (NewFields 2014), which do not occur in the study area (NNHP 2001a)**
Silverleaf sunray (*Enceliopsis argophylla*)	**S1 (Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats, or other factors)**	**Not believed to be present in study area. Although this species is presumed extant at or near the study area (NNHP 2001b), this plant is restricted to eroded, gypsum-rich soils (NewFields 2014), which do not occur in the study area (NNHP 2001a)**

[1] "Species of concern" is an informal term that refers to species that might be in need of concentrated conservation actions. This term replaced the term, "Category 2 Candidate Species," which referred to species for which the US Fish and Wildlife Service had some indication that listing might be warranted, but insufficient data to justify a proposal to list them.

FISH AND WILDLIFE AND THEIR HABITATS

The study area supports fish and wildlife species that are characteristic of the northeastern Mojave Desert. Common wildlife species observed during a January 20, 2014, field visit to determine the location of the bypass's streambeds, and a March 6, 2014, field reconnaissance for this project, include common raven (*Corvus corax*), turkey vulture (*Cathartes aura*), desert bighorn sheep (*Ovis canadensis nelsoni*), and a desert tortoise shell (*Gopherus agassizii*). Other species observed in other areas of the bypass are discussed in the Biological Assessment (NewFields 2014).

Some of these vertebrate species that occur in Clark County have been federally listed as endangered, threatened, or candidate species or state-listed as critically imperiled, imperiled, vulnerable, or apparently secure species. Species that are protected either under federal or state regulations are described in greater detail below.

SPECIAL-STATUS WILDLIFE SPECIES

As part of the larger bypass project, protected and sensitive species were originally discussed in the 2005 FEIS, and more recently in the Biological Assessment (NewFields 2014). In February 2014, a list of federally listed species was obtained from USFWS's Information, Planning, and Conservation System (USFWS 2014a) for the project area (Appendix E). These federally listed species were further evaluated for their occurrence in this specific study area (Appendix F). Also, because the Regional Transportation Commission of Southern Nevada and Nevada Department of Transportation requested additional state sensitive species be included in the Biological Assessment, these species were also further evaluated for potential impacts by the proposed special use permit (Appendix G).

After evaluating both the federal and state fish and wildlife species list, the following species may be impacted by the proposed waterline and/or transmission line relocation: razorback sucker (*Xyrauchen texanus*) (federally endangered), desert tortoise (federally threatened), common chuckwalla (*Sauromalus ater*), Gila monster (*Heloderma suspectum cinctum*) (state vulnerable), and desert bighorn sheep (state – apparently secure). Additionally, designated Critical Habitat for the razorback sucker is found within the study area. Several state sensitive bat species could occur in or near the study area, because they could use adjacent cliffs for roosting (Appendix G). No other federally or state-listed species or their habitats are found in the study area.

Razorback Sucker

The razorback sucker prefers warm, riverine environments; however, the installation of dams (e.g., Hoover Dam) changed the riverine environment to deep lakes and cool tailwaters (NewFields 2014). Therefore, in 1994, the US Fish and Wildlife Service designated Critical Habitat for the razorback sucker in the Colorado River Basin (50 CFR Part 17). Specific to this project, the entirety of Lake Mead is designated Critical Habitat for the razorback sucker. However, the proposed waterline intake area at Hemenway Harbor is approximately 20 miles from known spawning sites at Echo Bay, 5 miles from known spawning sites at Las Vegas Bay, and 30 miles from known spawning sites at the Muddy River/Virgin River Intake areas (NewFields 2014). This means that juvenile razorback

suckers are not likely to be caught in the water pipeline intake, even though adults could be in the area.

Desert Tortoise

The desert tortoise occurs throughout most of the Mojave region, including the study area. The tortoise prefers flats and bajadas with soils ranging from sand to sandy-gravel characterized by scattered shrubs and abundant inter-shrub space for herbaceous plant growth. They also prefer rocky terrain and sloping habitats. In 1990, the US Fish and Wildlife Service listed the desert tortoise as threatened, and in 1994, it designated Critical Habitat for the tortoise. The study area is not located within any USFWS desert tortoise-designated Critical Habitat. One desert tortoise shell was observed just west of the study area during a January 20, 2014, survey for streambeds, while biologists observed eight live tortoises during April-May 2014 surveys in the proposed bypass EIS study area (NewFields 2014).

Common Chuckwalla

The common chuckwalla, a large lizard, is widely distributed across western Arizona, southern Nevada, southeastern California, Baja California, and northwestern Sonora. The common chuckwalla is restricted to rocky areas in desert flats, hillsides, and mountains where crevices are available for shelter. Common chuckwallas are currently not federally or state-protected; however, it was noted as a species of concern by the Regional Transportation Commission of Southern Nevada and the Nevada Department of Transportation. Abundant potential habitat (e.g., hillsides or rocky outcrops) exists in the vicinity of the transmission line relocation, where the terrain is mountainous, steep, and rocky. No common chuckwallas were observed during the January or March 2014 field surveys.

Gila Monster

The geographic range and habitat of the Gila monster overlaps with that of the desert tortoise. This venomous lizard is found below 5,000 feet elevation on rocky slopes and landscapes of upland desert scrub interspersed with desert washes (NDOW 2007). The Gila monster is classified as a state sensitive reptile (NAC 503.080) and is protected under Nevada state law (NAC 503.090 and NAC 503.093). No Gila monsters were observed during either biological surveys.

Desert Bighorn Sheep

Desert bighorn sheep density is relatively high in portions of the northern Eldorado Mountains (NewFields 2014). Nevada Department of Wildlife conducted an aerial survey in the northern portion of the Eldorado Mountains (Unit 266) in 2011 and reported a sample of 75 desert bighorn sheep. Desert bighorn sheep are protected under state law (Nevada Revised Statutes 501) and are managed by the Nevada Department of Wildlife. Two separate herds of desert bighorn sheep were observed respectively during the January and March 2014 field visits.

WATER RESOURCES

SURFACE WATER

The US Geological Survey and US Environmental Protection Agency divide and subdivide the United States into successively smaller hydrologic units based on hydrologic features. Starting at the smallest unit, the study area is located within the Hemenway and Kingman Wash and White Rock Canyon sub-watersheds, which are part of the Lake Mead and Havasu-Mohave Lakes sub-basins and the larger Colorado River Basin (USEPA 2014c). Surface water in the vicinity of the study area includes Lake Mead, the Colorado River, and unnamed ephemeral water bodies including dry washes. All surface water drains toward Lake Mead and the Colorado River (figure 7).

Precipitation in Boulder City and throughout the study area averages 5.5 inches per year (Western Regional Climate Center 2014). Runoff from these precipitation events, which are almost entirely in the form of rainfall during infrequent storm events, is conveyed through these smaller drainage systems. Precipitation runoff within the study area flows either into the Colorado River or Lake Mead via the Hemenway, Kingman, and unnamed washes.

Lake Mead, which was created following the completion of Boulder Dam (now called Hoover Dam) in 1935, was the largest artificial lake in the world at that time of its completion. It is still the largest reservoir in the United States in maximum water capacity (Rosen et al. 2012). At an elevation of 1,221.4 feet, the reservoir covers about 158,500 acres (248 square miles) and extends approximately 110 miles upstream toward the Grand Canyon to the Hoover Dam (US Bureau of Reclamation 2014a). However, since 1998 the runoff from the Colorado River has been below normal and as a result the lake level is lower than it has been in over 40 years (NPS 2014c.). Lake Mead is located within the Lake Mead NRA. There are no designated federal wild and scenic rivers in the project area.

The state of Nevada is part of the Colorado River Compact, which was negotiated by the Colorado River Basin states and the federal government in 1922 and includes the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. It divides the Colorado River Basin into two basins—the upper and lower. At the time it clarified the relationship between the upper basin states, where most of the river's water supply originated, and the lower basin states, where most of the water demands were developing (US Bureau of Reclamation 2014b). The Upper Basin includes Colorado, New Mexico, Utah, and Wyoming; the Lower Basin includes Arizona, California, and Nevada. The compact also apportions the right to exclusive beneficial consumptive use of 7.5 million acre-feet in perpetuity to both the Upper and Lower Basins.

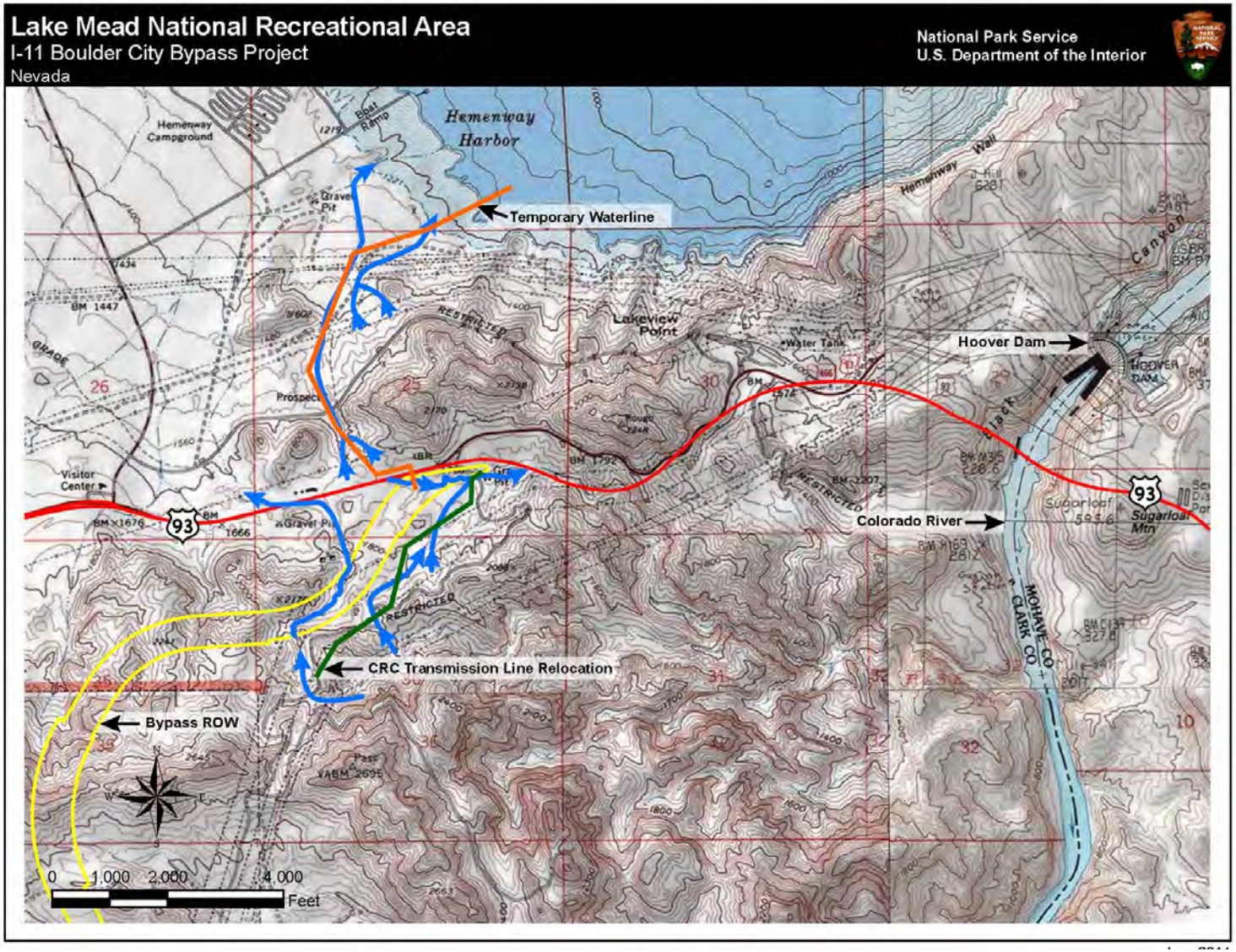


FIGURE 7. SURFACE WATER DRAINAGES

GROUNDWATER

The study area is located within the Colorado River basin hydrographic region, which is further broken down into the Black Mountains Area and the Colorado River groundwater basins as identified by the Nevada Department of Conservation and Natural Resources (NDCNR 2013). However, no known groundwater resources are located within the project area because the volcanic rocks comprising the Eldorado Mountains are not considered suitable for the formation of significant aquifers (FHWA 2005). With the expectation of a well at the Hacienda Hotel and Casino, no known water wells are present within the project area (NDCNR 2014).

WATER QUALITY

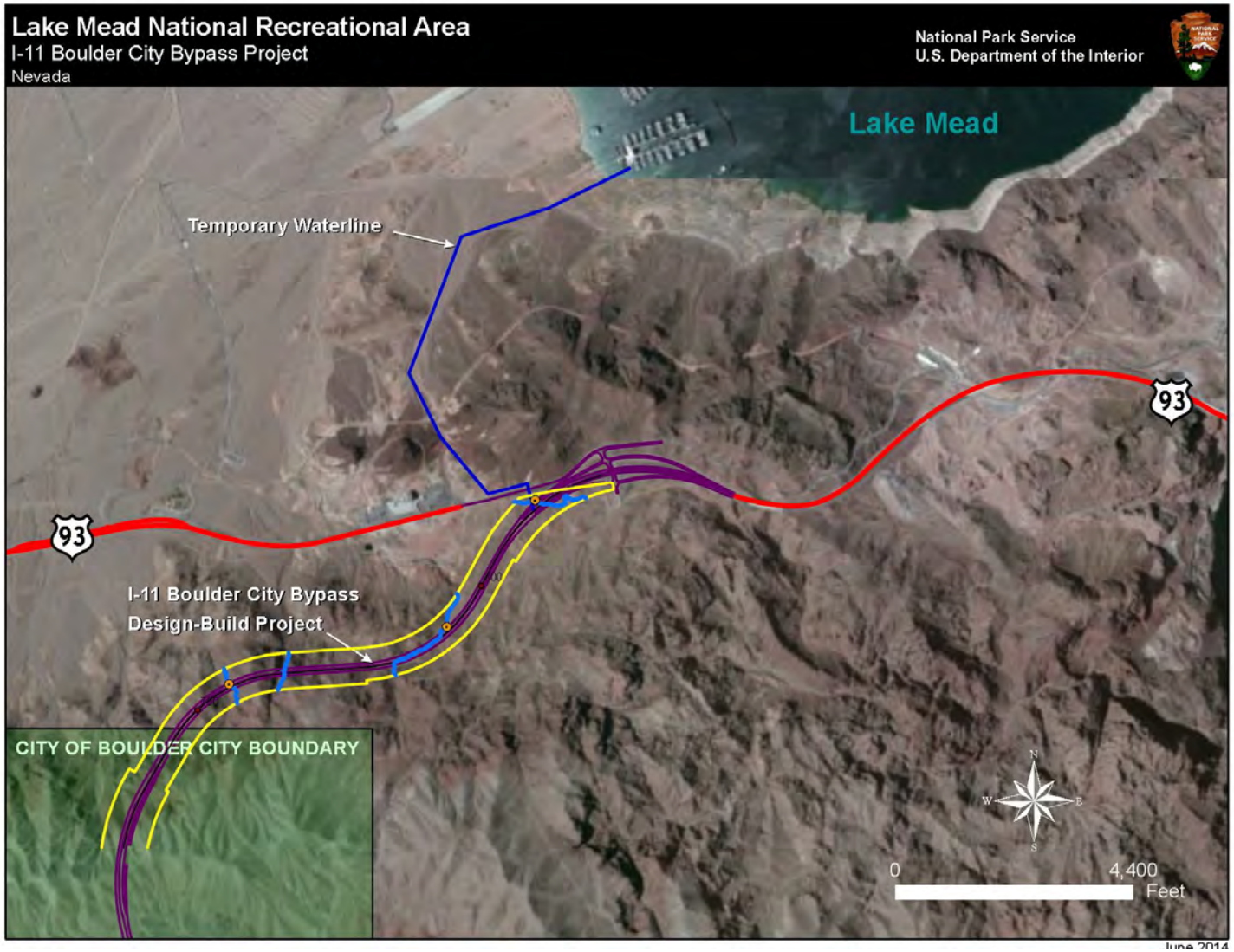
Lake Mead and the Colorado River are the two primary water resources in the vicinity of the study area. The Nevada Division of Environmental Protection retains statutory authority for water quality through its Bureau of Water Quality Planning. The bureau is responsible for collecting and analyzing water data, developing and assigning standards for surface waters, publishing informal reports, providing water quality education, and implementing programs that address surface water quality.

Water quality in Lake Mead generally exceeds standards set by the State of Nevada to protect water supplies for public uses including drinking water, aquatic ecosystem health, recreation, or agricultural irrigation. The primary water quality concerns are nutrient balance, algae, and dissolved oxygen, which can exceed water quality standards at times and in certain areas of Lake Mead (Rosen et al. 2012).

WATERS OF THE UNITED STATES

In January 2014, field investigations were conducted to determine the location and extent of juridical waters of the United States (ephemeral streambeds) that occur within the study area in accordance with USACE's *Wetlands Delineation Manual* (Environmental Laboratory 1987), *Field Guide to Identification of the Ordinary High Water Mark (OHWM)* (USACE 2008a), *Arid West Regional Supplement* (USACE 2008b), and revised OHWM dataform (USACE 2014). The Clean Water Act of 1972, as amended, requires that potential adverse effects on jurisdictional waters be avoided, minimized, or compensated (33 USC 1251 et seq.).

The field investigation confirmed that as a navigable waterway, Lake Mead is considered a water of the United States. Subsequently, any area within the ordinary high water mark of the lake is considered to be jurisdictional. Four additional ephemeral drainages were identified within the study area and are also considered waters of the United States because they drain into either Lake Mead or the Colorado River (see figure 8). The four drainages are the main ephemeral channels to Lake Mead and directly to the Colorado River, with other smaller tributaries feeding into them within the study area.



Source: RTC 2014

FIGURE 8. EPHEMERAL DRAINAGES (WATERS OF THE UNITED STATES)

WETLANDS

Three parameters must be present to meet the criteria for existing wetlands: (1) hydrophytic (water-loving) plants, (2) hydric soils, and (3) frequency of flooding (saturated with water or covered by shallow water at some time during the growing season of each year) (Cowardin et al., 1979). Based on these parameters, no wetlands were identified in the study area during the January 2014 field investigation. In addition, no strong indicators for all three parameters in one particular area outside of the ordinary high water mark of Lake Mead were identified (RTC 2014). Areas within the study area are dominated by upland shrub-steppe plant communities, which are not considered wetlands according to USACE's *Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Arid West Regional Supplement* (USACE 2008).

AIR QUALITY

NPS's *Management Policies 2006* states that the National Park Service will "seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems, (2) preserve cultural resources, and (3) sustain visitor enjoyment, human health, and scenic vistas" (NPS 2006). NPS *Management Policies 2006* further state that the National Park Service will assume an aggressive role in promoting and pursuing measures to protect air quality related values from the adverse impacts of air pollution. Air quality is an important component of the visitor experience at national parks, with 81% of visitors surveyed in the Pacific West region rating air quality extremely or very important (NPS 2013a).

NATIONAL AMBIENT AIR QUALITY STANDARDS

The Clean Air Act led to the creation of National Ambient Air Quality Standards by the US Environmental Protection Agency for six criteria air pollutants: carbon monoxide (CO), lead, nitrogen dioxide, ozone, particulate matter (PM), and sulfur dioxide (SO_2). There are two types of National Ambient Air Quality Standards—primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (USEPA 2012a). The six criteria pollutants are briefly described below; table 5 summarizes the primary and secondary NAAQS for the criteria pollutants.

Carbon monoxide is a colorless, odorless gas emitted from combustion processes, such as cars and trucks. Elevated CO concentrations can cause adverse health impacts by reducing oxygen delivery to vital organs. Very high concentrations can cause death (USEPA 2013a).

Lead is a toxic heavy metal that can have numerous adverse health impacts, including neurological damage to children and cardiovascular effects in adults (USEPA 2012b). Lead emissions can contribute to exposure through the air directly or indirectly by causing soil/water contamination.

According to the US Environmental Protection Agency, the major sources of lead emissions to the air today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline (USEPA 2012c).

Nitrogen dioxide is one of a group of reactive gases called nitrogen oxides. Nitrogen dioxide forms small particles that penetrate deep in the lungs, and can cause or worsen existing respiratory system problems such as asthma, emphysema, or bronchitis. NO_2 emission sources include autos/trucks, power plants, and construction equipment, among others. Nitrogen oxides are also a precursor to the formation of ozone (USEPA 2013b).

TABLE 5. NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
carbon monoxide		primary	8-hour	9 ppm	not to be exceeded more than once per year
			1-hour	35 ppm	
lead		primary and secondary	Rolling 3 month average	0.15 μg/m³	not to be exceeded
nitrogen dioxide		primary	1-hour	100 ppb	98th percentile averaged over 3 years
		primary and secondary	Annual	53 ppb	annual mean
ozone		primary and secondary	8-hour	0.075 ppm	annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
particle matter	$PM_{2.5}$	primary	Annual	12 μg/m³	annual mean averaged over 3 years
		secondary	Annual	15 μg/m³	annual mean averaged over 3 years
		primary and secondary	24-hour	35 μg/m³	98th percentile averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 μg/m³	not to be exceeded more than once per year on average over 3 years
sulfur dioxide		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations averaged over 3 years
		secondary	3-hour	0.5 ppm	not to be exceeded more than once per year

Source: USEPA 2012a

Note: ppm = parts per million, μg/m³ = micrograms per cubic meter, and ppb = parts per billion

Ozone (ground-level) is an important component of smog and is formed through reactions of nitrogen oxides and volatile organic compounds in the presence of sunlight. Sources of nitrogen oxides and volatile organic compound emissions include industrial facilities, electric utilities, vehicle exhaust, gasoline vapors, and chemical solvents. Health effects of ozone exposure include respiratory irritation, reduced lung function, and worsening of diseases such as asthma. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to ozone. Elevated ozone can also impact sensitive vegetation (USEPA 2012d).

Particulate matter is a broad class of air pollutants that exist as liquid droplets or solids, with a wide range of size and chemical composition. Particulates that are smaller than or equal to 10 and 2.5 microns in size (PM_{10} and $PM_{2.5}$) are of particular health concern because they can get deep into the

lungs and affect respiratory and heart function. Particulates can also impact visibility; damage soil, plants, and water quality; and stain stone materials (including culturally important statues and monuments) (USEPA 2014d).

Sulfur dioxide is part of a group of reactive gasses called oxides of sulfur. Health effects of SO_2 exposure include adverse respiratory effects, such as increased asthma symptoms (USEPA 2013c). The largest sources of SO_2 emissions are from fossil fuel combustion at power plants/industrial facilities (USEPA 2013d).

Attainment Status

Areas that have never been designated nonattainment for a pollutant and National Ambient Air Quality Standards are considered attainment areas. Areas that do not meet National Ambient Air Quality Standards are classified as nonattainment areas for that particular pollutant(s). Control strategy state implementation plans are designed to bring nonattainment areas into compliance with National Ambient Air Quality Standards. Former nonattainment areas currently meeting National Ambient Air Quality Standards are designated maintenance areas. Certain actions by federal agencies, such as the National Park Service, in designated nonattainment or maintenance areas are subject to the general conformity regulations to ensure consistency with applicable state implementation plans.

The study area is located in Clark County, Nevada. Although portions of Clark County in the Las Vegas Valley (specifically Hydrographic Basin 212) are nonattainment for course PM (PM_{10}), the study area is outside the boundaries of the nonattainment area (Clark County 2008). The study area is in attainment for all six criteria pollutants (USEPA 2013e). Therefore, general conformity requirements (40 CFR 93, Subpart B) are not applicable.

Air Quality Monitoring Data

Lake Mead NRA has been designated as a Class II air quality area under the Clean Air Act, meaning that it is in attainment of National Ambient Air Quality Standards and that only modest increases in certain pollutants are allowable. Air quality is generally good within Lake Mead NRA. Most reductions in air quality are due to air flows from the Las Vegas Valley, west of Lake Mead NRA (NPS 2013b).

No recent air quality monitoring data are available specific to Lake Mead NRA. Table 6 summarizes the available monitoring data from other locations in the general region, including data for Boulder City and Las Vegas (where Boulder City data is not available) (USEPA 2013c). Although not necessarily representative of Lake Mead NRA, the available monitoring data provides a general context for understanding potential background concentrations of criteria pollutants. Given that the air quality monitors are located in urbanized areas with numerous mobile and point emissions sources, existing pollutant concentrations within Lake Mead NRA would be expected to be less than the regional monitored concentrations shown in table 6.

TABLE 6. 2013 REGIONAL AIR QUALITY MONITORING DATA

Pollutant		Averaging Time	NAAQS	Monitored Concentration	Location/ Site ID
Carbon monoxide		8-hour	9 ppm	3.1 ppm (max)	4250 Karen Ave Sunrise Manor/ 32-003-0540
		1-hour	35 ppm	3.6 ppm (max)	
Lead		Rolling 3 month average	0.15 µg/m3	0.009 µg/m^3 (max 24-hr)	
				0.003 µg/m3 (mean 24-hr)	
Nitrogen dioxide		1-hour	100 ppb	47.2 ppb (98th percentile)	2501 Sunrise Avenue, Las Vegas/ 32-003-0561
		annual	53 ppb	32.9 ppb (annual mean)	
Ozone		8-hour	0.075 ppm	0.071 ppm (4th highest)	1005 Industrial Road, Boulder City/ 32-003-0601
Particle pollution	$PM_{2.5}$	annual	12 µg/m^3	8.7 µg/m^3 (annual mean)	2501 Sunrise Avenue, Las Vegas/ 32-003-0561
		24-hour	35 µg/m^3	23.6 µg/m^3 (98th percentile)	
	PM_{10}*	24-hour	150 µg/m^3	245 µg/m^3 (max during April 15, 2013 windblown dust event)	1005 Industrial Road, Boulder City/ 32-003-0601
				107 µg/m^3 (second highest)	
Sulfur dioxide		1-hour	75 ppb	7.3 ppb (99th percentile)	4250 Karen Ave Sunrise Manor/ 32-003-0540
		3-hour	0.5 ppm	0.01 ppm (max)	

Source: USEPA 2014e

Note: ppm = parts per million, ppb = parts per billion, and µg/m3 = micrograms per cubic meter

*Data includes exceptional events, such as dust storms.

Monitoring data in the Las Vegas Valley (Sunrise Manor) shows concentrations of carbon monoxide, lead, and sulfur dioxide to be well below the applicable NAAQS. Similarly, nitrogen dioxide and fine particulates ($PM_{2.5}$) monitoring in Las Vegas in 2013 also shows concentrations under the standards.

In 2013, the 8-hour ozone concentration of 0.071 parts per million (ppm) in Boulder City was below but close to the National Ambient Air Quality Standards of 0.075 ppm. This concentration is high, with potential for impacts on sensitive animal populations and effects on vegetation (NPS 2011). Official compliance with National Ambient Air Quality Standards is based on the annual fourth-highest daily maximum 8-hour concentration averaged over three years, not the fourth-highest concentration from a single year as presented here for general information.

Course PM (PM_{10}) monitoring in Boulder City shows 24-hour average concentrations are well below the standard of 150 micrograms per cubic meter (µg/m^3) the majority of the time (e.g., 14 µg/m^3 annual average and 98th percentile of 61 µg/m^3 in 2013). However, the standard was exceeded in 2013 during a windblown dust event, with a maximum concentration of 245 µg/m^3 on April 15.

Government alerts and media coverage substantiate the windblown dust event on April 15, 2013 (Clark County2013). The second-highest concentration was much lower and below the National Ambient Air Quality Standards at 107 μg/m^3. Provided certain requirements are met, dust storms (such as the April 15, 2013 event) are an "exceptional event" for which the affected data can be excluded from the determination of whether an area attains to the National Ambient Air Quality Standards (USEPA 2013f).

Clark County submitted a request to the US Environmental Protection Agency to be redesignated to attainment for PM_{10} in 2012, along with a maintenance plan (Clark County 2012). The county has also completed an action plan specifically addressing the response to windblown dust events, including public notification procedures and dust control permitting (Clark County 2005).

SOUNDSCAPES

Noise is commonly defined as unwanted sound that disrupts normal human activities or diminishes the quality of the human environment. Noise-sensitive receptors are those locations where activities could be affected by increased noise levels, and include locations such as residences, lodging, religious institutions, schools, parks, and libraries.

Transient noise sources, such as passing aircraft or motor vehicles, produce noise that is usually of short duration and excluded from regulation. Stationary sources, such as power substations or mining operations, can emit noise over a longer period. Ambient noise is all noise generated in the vicinity of a site by typical noise sources, including traffic, wind, and neighboring industries. The total ambient noise level is a typical mix of noise from distant and nearby sources, with no particular dominant sound (BPA 2010).

Environmental noise, including transmission line noise, is usually measured in decibels on the A-weighted scale (dBA).[2] This scale models sound as it corresponds to human perception. Table 7 shows typical noise levels for common sources expressed in decibels on the A-weighted scale. Noise exposure depends on how much time an individual spends in different locations.

Exceedance levels (L levels) refer to the A-weighted sound level that is exceeded for an identified percentage of time during a specified period. Therefore, L50 refers to a particular sound level that is exceeded 50% of the time. L5 refers to the sound level exceeded 5% of the time. Sound-level measurements and predictions for transmission lines are often expressed in terms of exceedance levels, with the L5 level representing the maximum level and the L50 level representing a median level. USEPA has established a guideline of 55 dBA for the average day-night noise level (Ldn) in outdoor areas (USEPA 1974, 1978). In computing this value, a 10 dBA correction (penalty) is added to night-time noise between the hours of 10:00 p.m. and 7:00 a.m.

[2] A-weighted decibels are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced. This correction is made because the human ear is less sensitive at low audio frequencies, especially below 1,000 Hz, than at high audio frequencies.

TABLE 7. COMMON NOISE LEVELS

Sound Level, dBA[1]	Noise Source or Effect
110	Rock-and-roll band
80	Truck at 50 feet
70	Gas lawnmower at 100 feet
60	Normal conversation indoors
50	Moderate rainfall on foliage
40	Refrigerator
25	Bedroom at night

Source: Adapted from BPA 1986, 1996
Note: Decibels (A-weighted)

Within the study area, the primary existing environmental noise sources contributing to ambient noise levels are vehicular traffic on US Highway 93, Northshore Road, and other local roadways and boat traffic in Las Vegas Boat Harbor and Lake Mead Marina (NPS 2013b). Other sources of environmental noise include helicopter overflights associated with visitor activities and occasional distant aircraft overflights.

There are no residences, religious institutions, schools, or similar sensitive noise receptors within the study area. The Hacienda Hotel and Casino is located adjacent to US Highway 93, less than 0.5-mile north of the proposed transmission line relocation and immediately west of the proposed waterline alignment. The closest populated area to the project area is Boulder City, approximately 2.5 miles to the southwest. Boulder City does not have a development ordinance or noise compatible development land use plan that requires construction of noise barriers for new development. While there is no restricted airspace, overflights of Boulder City are discouraged (FHWA 2005). As a unit of the National Park Service, Lake Mead NRA is subject to Director's Order 47, *Soundscape Preservation and Noise Management*, which articulates NPS operational policies that will require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources.

CULTURAL RESOURCES

This section presents a summary of cultural resources documented within the study area and in the project vicinity. A Class III cultural resources inventory included a pre-field records and literature review and pedestrian survey for the CRC relocation, the waterline, and the access road within the study area to identify and document cultural resources that could be affected by the undertaking.

The pedestrian inventory effort for this project resulted in the documentation of 5 newly identified cultural resource sites (i.e., archeological sites) and 15 isolated finds. In addition, two previously

documented sites occur within the project, the US Government Construction Railroad grade (26CK4751) and the Sullivan Turquoise Mine (26CK23/6290). Four of the five new archeological sites are associated with early- to mid-twentieth-century mining activities, while a solitary prehistoric site comprises a single-walled hunting blind feature. The five sites are not considered to be eligible for the national register under any criterion. Isolated finds are considered categorically ineligible for the national register.

CULTURAL SETTING

Southern Nevada is a prehistoric cultural borderland. The area exhibits influences from the Great Basin, the Southwest, and southern California. Most reviews of local prehistory borrow from broad regional overviews. Problems arise in the interval post-dating AD 200, when a variety of cultural influences manifest themselves in the region. Local researchers attempt to reduce confusion by avoiding culturally specific terms, preferring the generic term "Ceramic Period" or "Puebloan Period" for this temporal interval.

The earliest historical influences in southern Nevada are often related to exploration and transportation corridors and mining. Travel along the Old Spanish Trail/Mormon Road significantly increased following the publication of John C. Fremont's map in 1845. During this period, regular wagon travel was established along the trail. Large numbers of prospectors and settlers flowed southward along the route during the California Gold Rush (1848–1850). The road also brought Mormon settlers through the area on their way to their outpost in San Bernardino during this time.

Construction of Hoover Dam in the 1930s dramatically increased development in the project vicinity with the introduction of a branch line railroad, road networks, several hydroelectric power transmission lines, squatter camps, and a federally administered construction town, Boulder City. Impoundment of the Colorado River by Hoover Dam created a vast reservoir, Lake Mead, which spurred regional development and generated recreational use and ancillary development, including the development of gambling facilities and a restaurant at the present-day location of the Hacienda Hotel and Casino.

Modern development through the project area includes various realignments of State Highway 93, construction of electrical power transmission lines (and associated access roads), repurposing of a 1930s-era branch rail line into a hiking trail (i.e., rail to trails), aggregate mining, and several construction cycles of the Hacienda Hotel and Casino.

PREVIOUSLY DOCUMENTED CULTURAL RESOURCES

Prior to fieldwork, a literature review was conducted and records searched as part of the Class III cultural resources inventory for the project. Historical documents and modern literature depict mining, transportation, communication, overhead utilities, and hydroelectric/reclamation systems in the project vicinity. A review of the online database, the Nevada Cultural Resource Information System, revealed that two cultural resources are documented in the project inventory corridor, the US Government Construction Railroad (USGCR) grade (26CK4751) and the Sullivan Turquoise

Mine site (26CK23/6290), which includes prehistoric and historic-period mining components. The US Government Construction Railroad is a historic property eligible for the national register under Criterion A, as the only remaining section of the Hoover Dam Railroad system used for construction of the dam that is not highly disturbed or under water. Eligibility of the Sullivan Turquoise Mine site is not presently determined, pending Native American consultation for its potential status as a traditional cultural property.

Class III Inventory Area and Results

The study area comprises the Class III cultural resource inventory area for this aspect of the bypass project and totals 104 acres (63 acres for the pipeline corridor and 41 acres for the transmission line). The pipeline corridor extends from a point immediately south of US Highway 93 and west of the Hacienda Hotel and Casino across the highway and down Sullivan Gulch and Wash to Lake Mead at Hemenway Harbor, a distance of 1.54 miles (2,479 meters). The pipeline would run through a culvert at the base of the USGCR embankment across Sullivan Gulch and would not affect this historic property. The transmission line relocation corridor extends from the southern end of the existing US Highway 93 – SR 172 interchange in a southwest direction between existing transmission lines and roughly along Gold Strike Road for a distance of 1 mile (1,654 meter). This corridor runs along upper Sullivan Gulch and along the ridgetop above Gold Strike Canyon.

The Class III inventory effort resulted in the documentation of 5 newly-identified cultural resource sites, identification of the previously documented USGCR grade (26CK4751) and the Sullivan Turquoise Mine (26EK23/6290), and 15 isolated finds. The five newly identified sites include four historic-period sites associated with early- to mid-twentieth century mining and one prehistoric site, a single-walled hunting blind. Three of the historic-period sites and both the USGCR grade and the Sullivan Turquoise Mine occur within the proposed pipeline corridor north of US Highway 93, while the remaining historic-period site and the prehistoric site are within the proposed transmission line corridor, south of the highway.

The 15 isolated finds consist of 14 historic-period artifacts and 1 prehistoric artifact. The historic-period isolates include two prospects, three rock cairns, three cans (vent-hole-milk, hole-in-cap, and sanitary), four bottles/bottle fragments, a galvanized metal water jug, and a fuel tin. Four of these isolates occur within the patented Sullivan mining claims north of the US Highway 93. The single prehistoric isolate is an elongated cobble with battered ends and a pecked, ringed hafting notch consistent with similar implements (i.e., heavy mauls) known from the project vicinity.

The following section presents brief summaries of each of the five newly identified cultural resource sites (i.e., archeological sites) arranged by their respective corridors. Temporary site numbers are used in lieu of formal state numbers, which have yet to be assigned.

Pipeline Corridor Results

BCB-01. Resource BCB-01 is a small historic-period mining site, which consists of one adit and one can. This limited early- to mid-twentieth century mining venture is located in the pipeline inventory

corridor north of US Highway 93 on a slope at the edge of a wash below Basalt Butte. The surface is composed of basalt colluvium draped over underlying quartz monzonite.

The adit (feature 1) measures approximately 8 x 3 feet and is excavated eastward into the hillslope to a depth of 6 feet. Feature 1 extends into bedrock below the contact of basalt volcanics over what appears to be quartz monzonite. An excavated area in front of the adit measures 15 x 10 feet; waste rock is piled south and west of the opening in linear form. The can is a crushed and heavily-weathered hole-in-cap pre-dating the 1930s. A modern hiking trail lies about 115 feet below feature 1.

BCB-02. Resource BCB-02 is a large historic-period miscellaneous feature site consisting of a rock cairn, 10 cans, and a few glass fragments. This sparse, mid-twentieth century debris scatter and cairn site is located in the pipeline inventory corridor north of US Highway 93 in the broad channel of a large wash (lower Sullivan Gulch) above the Lake Mead Marina and the Hemenway Harbor shoreline.

The rock cairn (feature 1) is partially collapsed and is composed of approximately 30 small boulders and large cobbles stacked two courses high. The associated debris includes four church-key-opened beverage cans, two hole-in-cap meat tins, two single serve dry goods cans, one single serve sanitary fruit/vegetable can, and a fragment of a hole-in-cap. In addition, a few fragments of clear and brown glass were observed.

BCB-03. Resource BCB-03 is a medium-sized historic-period habitation site, which consists of one dug out rectilinear rock alignment (feature 1), approximately 60 cans, fragments of 5 bottles, and miscellaneous metal debris. This short-term early- to mid-twentieth century encampment is located in the pipeline inventory corridor north of US Highway 93 in a relatively flat area above the west side of a prominent wash (Sullivan Gulch) with a large quartzite rock outcrop at the northern margin of the site boundary. A modern transmission line and associated access roads is immediately west of the site boundary. This resource is probably associated with mining activities in the vicinity.

Feature 1 is a rectangular depression with rock and earthen berms along all four sides, which is likely the remains of a temporary habitation structure. It has exterior dimensions of 16 feet, 5 inches x 13 feet, 7 inches and interior dimensions of 9 feet, 10 inches x 8 feet, 11 inches and is excavated up to 14 inches into the ground surface. Within the feature is a dump pile of approximately 30 cans; a few fragments of glass; and a small piece of lath-sized, milled wood sticking upright in the ground. There are no obvious structural components; however, the wood may be a tent stake, and a small round piece of metal may be a grommet, which suggests the depression may have once been covered by a canvas structure.

Also noted immediately surrounding the feature are a few cans and miscellaneous items. The cans associated with feature 1 include 24 single-serve sanitary fruit/vegetable cans, 6 hole-in-cap cans, 3 rectangular fish tins, 1 small single-serve sanitary can embossed with “EST. 1825,” 1 hole-in-cap with a soldered seam, a rectangular 1-quart fuel can, 1 single-serve round meat tin, and 1 vent-hole milk can that dates from 1920 to1931. Also found in association with feature 1 are a few fragments of

purple glass and a few fragments of a clear liquor bottle with a metal screw top. Miscellaneous debris consists of a few wire nails, one heavily weathered square nail, a few pieces of 1/16-inch wire, a metal bracket that may be part of a boot heel, and a small pebble of turquoise.

Artifacts found in the general site area not in the immediate vicinity of feature 1 include approximately 20 cans, 3 bottles, and 1 large nail. The cans consist of 10 church-key-opened beverage (beer) cans, 6 single-serve sanitary fruit/vegetable cans, 2 vent-hole milk cans that date from 1920 to1931, and one crushed 5-gallon can. The bottle glass is fragments from two clear glass milk bottles and one brown glass bottle base with a "6316/MG 58/2" maker's mark from the Maywood Glass Co., which dates the bottle to 1958.

This short-term historic-period encampment is located just north of the Sullivan mining claims, and the early dates for the milk cans suggest some temporal association with the claims. However, the brown bottle base also suggests some later use of the site. As such, at least two episodes of temporary occupation are likely.

Transmission Line Corridor Results

BCB-04. Resource BCB-04 is a small, historic-period mining claim and prospect site, which consists of three features (a rock cairn, a prospect pit, and a linear rock alignment) and one pocket tobacco tin. This early- to mid-twentieth century limited mining venture is located in the transmission line inventory corridor south of US Highway 93 on a slope beside a small intermittent wash above a larger more prominent wash (Sullivan Gulch).

Feature 1 is a rock cairn measuring 50 inches x 50 inches x 16 inches comprising approximately 30 large cobbles stacked three courses high. Feature 2 is a prospect pit that measures about 10 feet x 7 feet, 6 inches x 20 inches deep, and contains two pieces of weathered, milled wood. Feature 3 is a linear rock alignment trending northeast-southwest, which measures 48 feet long with a single line of approximately 60 medium to large cobbles and small boulders. A single upright pocket tobacco tin was observed along the alignment feature. Embossed on the bottom is "Satisfaction Guaranteed/…" The next line likely says "Does not bite the tongue," and there is a striker plate beneath the lettering. This tin is from the Edgeworth brand, which post-dates 1913. Two nail holes penetrate the tin, likely from former attachment to a claim marker post.

BCB-05. Resource BCB-05 is a small, prehistoric stacked-rock feature site of unknown age located in the transmission line inventory corridor south of US Highway 93 on a ridge top separating Sullivan Gulch from Gold Strike Canyon. The feature is a single-walled hunting blind, apparently without associated artifacts, situated on small cleft in the bedrock on the ridgeline.

The hunting blind (feature 1) measures 11.5 feet long east-west and ranges in height from 11 to 27 inches. Feature 1 is composed of a single wall of approximately 80 cobbles stacked up to four courses in height. The wall is nearly intact except for a 20-inch section, which appears to be partially collapsed. The area of concealment behind the blind measures 9.5 x 72 feet and may contain artifacts; however, visibility is obscured by sediment accumulation and vegetation. The blind has a

view looking roughly north-northwest over a steep slope and an incipient drainage above Sullivan Gulch. In this steep and rocky terrain, the blind was likely used for hunting bighorn sheep. During the field survey, a small herd of bighorn sheep was observed in the area and bighorn sheep droppings are abundant along the ridge top.

VISITOR USE AND EXPERIENCE

Lake Mead NRA, located in the states of Nevada and Arizona, provides a wide variety of recreation and leisure opportunities for visitors, including fishing, picnicking, hiking, scenic driving, camping, swimming, canoeing, kayaking, hunting, and boating. Since 2000, Lake Mead NRA has averaged between 6.3 and 8.8 million annual visitors (NPS n.d. [a])

Because of the size of Lake Mead NRA and the small scale of alternatives evaluated in this environmental assessment, the study area for visitor use and experience is defined as the area on either side of US Highway 93 near the Hacienda Casino and Hotel. East and adjacent to the Hacienda Casino and Hotel, aerial tours of the Hoover Dam and surrounding area are provided by the Dam Helicopter Company.

North of the Hacienda Casino and Hotel, Lake Mead Marina and Las Vegas Boat Harbor are located at Hemenway and Horsepower Coves in Lake Mead (see figure 9). Lake Mead Cruises Landing is also located in this area where visitors can take a paddlewheel cruise to and from Hoover Dam (NPS n.d. [b]). This area is accessed via Lakeshore Road, Hemenway Road, and Horsepower Cove.

Source: NPS n.d. [b]

FIGURE 9. MARINAS IN HEMENWAY AND HORSEPOWER COVE

In the study area, a portion of the 3.7 mile Historic Railroad Trail is located between Hemenway Harbor and the Hacienda Casino and Hotel. The trail, which is now used for hiking and provides panoramic views of Lake Mead, is a former section of the Hoover Dam Railroad system constructed

in 1931 to transport materials for the construction of Hoover Dam (see figure 10). The trail was nominated for the national register in 1984 as the only remaining section of the Hoover Dam Railroad system used for construction of the dam that is not highly disturbed or under water. There are several other trails in the area where visitors can mountain bike, horseback ride, and walk (NPS n.d. [c]).

Source: NPS n.d. [b]

FIGURE 10. HISTORIC RAILROAD TRAIL

On the south side of US Highway 93, across from the Hacienda Casino and Hotel, visitors can access unpaved, backcountry areas on foot, horse, mountain bike, or street legal vehicles. This area is located in the generalized transmission corridor presented in figure 1, and consequently, does not experience high visitation numbers.

PUBLIC HEALTH AND SAFETY

The National Park Service is committed to providing high quality experiences for visitors and employees to enjoy recreation areas and other protected resources in a safe and healthy environment. The National Park Service strives to protect human life and provide for incident-free visits. A visitor incident is defined to be an unintentional event or mishap affecting any person, other than an NPS employee, resulting in serious injury or illness requiring medical treatment.

There are numerous safety concerns associated with visitation in Lake Mead NRA. Because Lake Mead NRA is located in the Mojave Desert, visitors are subject to extremely hot temperatures

between late spring and early fall. Desert thunderstorms, which bring the danger of lightening and flash flooding, are most common in the summer and fall months. The terrain in Lake Mead NRA varies considerably. Unpaved, backcountry areas can be difficult for visitors to navigate (NPS n.d. [d]).

Other potential public health and safety risks include wildlife and plant species that are dangerous to humans and pets. Wildlife, which typically do not confront humans unless threatened, include rattlesnakes, scorpions, and Gila monsters. The area is known to grow Oleander, a toxic plant to both humans and animals. Visitors are encouraged to familiarize themselves with this plant and ensure that they and/or their pets do not ingest any part of the plant (NPS n.d. [d]). Incidents typically occur when visitors are not properly prepared for a visit in this environment.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter analyzes both beneficial and adverse impacts that may result from the no-action and proposed alternatives. The discussion of impacts is presented by resource topic and alternative. Impacts that are beneficial are not quantified; however, adverse impacts are described in terms of duration and intensity. The method for analyzing impacts and those past, present, and reasonably foreseeable future actions within proximity to the project alternative that are considered as part of the cumulative impact analysis are described below.

GENERAL ANALYSIS METHOD

Impact analyses and conclusions included in the environmental review are based on data and other pertinent information found in existing literature, information and insight provided by NPS subject-matter experts and other agencies, and professional judgment of subject-matter experts.

For each impact topic, a discussion of potential beneficial and adverse effects associated with the no-action and action alternative is presented. This information is then used to determine how the action alternative would affect resource conditions when compared to the no-action alternative. A summary of potential project-induced impacts by resource topic and alternative is presented in table 2.

For each resource topic, impact analyses involve the following steps:

- Identify the geographic area that could be affected.
- Define the resources within that area that could be affected.
- Impose the alternative on the resources within the geographic area of potential effect.
- Identify the effects caused by the alternative, in comparison to the no-action alternative to determine the relative change in resource conditions. The effects of each are characterized based on the following factors:
    - Whether the effect would be beneficial or adverse.
    - The intensity of the effect, which is defined as negligible, minor, moderate, or major. Intensity definitions for such effects are provided in the methodology section for each impact topic. Intensity definitions were developed based on federal and state regulations and standards, NPS policies, consultation with regulators from applicable agencies, and discussions with subject-matter experts.
    - The duration of the effect as either short or long term. The specific definition of short-term effects and long-term effects differs by resource topic and therefore is defined under each respective discussion.
    - The geographic extent of effects, which may vary by resource topic and/or alternative.

- Whether the effect would be a direct result of the action or would occur indirectly because of a change to another resource or impact topic.

- Determine cumulative effects by evaluating the effect in conjunction with past, present, or reasonably foreseeable future actions within Lake Mead NRA and adjacent areas.

CUMULATIVE EFFECTS ANALYSIS METHOD

Sections 1508.7 and 1508.25 (a)(2) of CEQ regulations (1978) for implementing the National Environmental Policy Act of 1969, as amended, require an assessment of cumulative effects in the decision-making process for federal actions. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7).

NPS guidance on environmental impact analysis (Director's Order 12) is designed to evaluate cumulative effects in a way that helps to determine the additive impact of the alternative on each resource of concern. The guidance states "it is irrelevant who takes these actions (i.e., they are not confined to NPS or even federal activities), or whether they took place in the past, are taking place in the present, or will take place in the reasonably foreseeable future."

Cumulative effects were evaluated by combining the effects of each alternative with other past, present, and reasonably foreseeable future actions near the project elements included as part of the special use permit and bypass project as a whole and in and around Lake Mead.

IDENTIFIED CUMULATIVE ACTIONS

I-11 Boulder City Bypass Project

As described in "Chapter 1: Purpose of and Need for Action," this environmental assessment is being prepared and a special use permit requested as a result of design refinements and mitigation measures identified in the 2005 EIS. The 2005 EIS evaluated four potential alignments for the bypass project, all of which would traverse NPS lands. The signing of the Record of Decision in December 2005 documents FHWA's approval of the preferred alternative as the selected alternative.

The selected alternative for the bypass project includes a new, approximately 12-mile long, four-lane divided, full access-controlled roadway from the area just north of the US Highway 95 interchange at the western terminus to the Hoover Dam/Nevada interchange at SR 172 at the eastern terminus. The easternmost 1.5 miles of the bypass project would be located within Lake Mead NRA. The project has been designed to improve vehicular circulation and access to local businesses on and around the US Highway 93 corridor by reducing traffic congestion, increasing safety, and improving regional mobility. The bypass project has been identified as a critical element in the RTC's Regional Transportation Plan and Transportation Improvement Program and NDOT's Statewide Transportation Program.

Stabilization and Rehabilitation of the Historic Railroad Trail

Actions proposed as part of this project would stabilize and rehabilitate a nationally significant segment of the historic railroad grade that was used during construction of Hoover Dam. This grade was converted from a railroad track to what is now a popular walking, hiking, running, and biking trail for Lake Mead NRA visitors. It provides spectacular views of Lake Mead, overlooking the Boulder Beach area, as well as various opportunities for visitors to experience the railroad route that ran from Boulder City to Hoover Dam from 1931 to 1963. Stabilization and rehabilitation of the Historic Railroad Trail is required for continued public enjoyment of this significant cultural resource for current and future generations.

Actions undertaken as part of this project would improve approximately 2 miles of the Historic Railroad Trail that are susceptible to erosion and have drainage concerns. Aggregate base material would be placed on grade, and the surface would be compacted and leveled. Riprap would be added to fill and prevent further washouts and damage to the Historic Railroad Trail, where appropriate. Approximately 10,000 linear feet of trail would be treated and 3,000 cubic yards of base material placed and compacted to stabilize the trail. Compaction of the grade would make the trail more accessible to bicycles and for those with limited mobility (Boyles 2014).

Low Water Amendment to Lake Mead NRA General Management Plan

Over the past ten years, persistent drought has significantly lowered the water level of Lake Mead. As a result, Lake Mead NRA has been operating under a Low Water Amendment to its General Management Plan (GMP) since 2005 that guides management actions to a water level of 1,050 feet (NPS 2005). Without surplus water deliveries, Lake Mead's elevation can drop 12 feet to 15 feet per year. Current projections are for continued decreases, potentially as much as 45 vertical feet over the next two years, which would result in Lake Mead dropping to levels not addressed in the current GMP amendment. These vertical drops in water levels translate into hundreds of feet of horizontal movement in the water's edge from its current location. As a result, there is an urgent need to complete a new planning initiative for even lower lake levels.

Current lake levels at Lake Mead are approximately 1,092 feet (NPS 2014d). A proposed amendment to the General Management Plan would guide operations down to 950 feet and evaluate management options for visitor facilities to provide continued public access to Lake Mead during extreme low water conditions. The GMP amendment would include decisions regarding the suitability of the continued use of existing marinas, launch ramps, and other visitor facilities and would identify the steps necessary for continued operation at each of the lake access sites. The location and size of lake access facilities would be consistent with the zoning and density goals and objectives of the Lake Management Plan (Boyles 2014).

Lake Mead Intake No. 3 Project

As a result of decreasing water levels in Lake Mead, the Southern Nevada Water Authority is constructing an additional deep water intake in Lake Mead, which would serve the Alfred Merritt Smith Water Treatment Facility and the Southern Nevada Water System. The project is being

constructed because as water levels decrease, existing intake pumping facilities expend more energy to lift water a greater distance, with a corresponding decrease in flow. This can be mitigated to some extent by adding pumping units. However, the existing intakes will become inoperable if lake levels fall far enough.

As part of this project, the Southern Nevada Water Authority has been granted an expansion of the existing right-of-way and approval to construct and operate a new water supply facility within Lake Mead NRA. Expansion of the right-of-way is necessary to include the area surrounding the new intake structure, corridor above the new intake tunnel, new intake pumping station, new access road to the pumping station, new excavated material placement areas and viewshed berms, and new connecting pipeline to the Alfred Merritt Smith Water Treatment Facility (NPS n.d. [e]).

IMPACTS ON NATURAL RESOURCES

IMPACTS ON SOILS

Methods and Assumptions

Potential impacts that may result from project alternative were assessed based on the extent of disturbance to soils. The analysis is based on the identification of soils in the vicinity of action alternative, activities associated with the construction and operation of the action alternative, and professional judgment of subject-matter experts.

Study Area

The study area for the soils impact analysis includes those areas where project elements associated with the action alternative would occur. The analysis assumes that project-related activities would not occur outside of this area. The area within an approximately 5.5 square mile area surrounding project elements associated with the action alternative is defined as the study area (see figure 1). The same study area is applied for the cumulative impact analysis.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on soils that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in the condition or appearance of soils or a change that moves toward a desired condition.

An adverse impact is one that results in a change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. The impact would not result in discernible alteration to soils. The ability of soils to sustain biota, water quality, and hydrology would not be affected, and reclamation would not be necessary.

Minor. The impact would be slight but detectable in localized and relatively small areas. Alteration to soils would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within two years. Mitigation measures to offset adverse effects, if necessary, would be simple and successful.

Moderate. The impact on soils would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within three years to five years. Mitigation measures to offset adverse effects, if necessary, could be extensive but would likely be successful.

Major. The impact on soils would have a lasting effect on the ability to sustain biota, water quality, and hydrology such that reclamation could not successfully be achieved. Extensive mitigation measures would be needed to offset adverse effects and their success could not be guaranteed.

Duration. Short-term impacts of the transmission line construction would be expected over approximately six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline would not be constructed. There would be no increase in use of the existing transmission maintenance road related to the movement of heavy material haul trucks and other construction-related vehicles, and no new access roads would be graded. Therefore, the no-action alternative would have no impacts on soils.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact soils include implementation of the bypass project, construction activities associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP. The siting of the bypass project would result in long-term, major but localized, adverse impacts on soils within Lake Mead NRA because it would permanently alter the productive capacity and natural hydrology of native soils within the project footprint, replacing them with impervious surface. The extent and location of these impacts may vary should the alignment need to be refined if the special use permit is not issued.

Construction of the deep water intake, related facilities, and access roads would create ground disturbance and therefore would have short-term, moderate but localized, adverse impacts on soils. The presence of permanent facilities and access roads associated with operation of the intake would permanently alter the productive capacity and natural hydrology of the native soils within the project footprint of the facilities and roads, and would therefore have long-term, moderate, adverse impacts on soils in localized areas.

On the Historic Railroad Trail, repair of existing trail damage and implementation of erosion control measures would have short-term, negligible to minor, adverse impacts on soils resulting from ground disturbance during implementation. Long-term impacts on soils would be beneficial because stabilization and rehabilitation efforts would mitigate erosion in the future.

The implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP would affect soils within localized areas because more soil would be exposed from the receding water levels and soil disturbance would occur as a result of possible extensions of marina access roads and public boat launch ramps. In addition, the recently exposed soils could provide new habitat for the introduction of early successional invasive weeds in areas of frequent visitor use. Potential soil impacts could occur in the gap between existing access roads and the lower shoreline, as visitors may use several different routes (social trails) to drive to and park at the shoreline. As a result, adverse impacts on soils would be minor to moderate and both short term and long term.

Past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate, adverse impacts and some long-term, beneficial impacts on soils. Because there would be no impacts from the no-action alternative, there would also be no cumulative impact associated with the no-action alternative in combination with other past, present, and reasonably foreseeable future actions.

Conclusion. Implementation of the no-action alternative would not result in impacts on soils or contribute to cumulative impacts on soils. Past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate, adverse impacts and some long-term, beneficial impacts on soils.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on soils that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. The relocation of the transmission line would disturb soils in localized areas with the siting of new tubular steel monopoles. As noted in Chapter 3, there is a potential for naturally occurring asbestos in soils within the project area; therefore, soil disturbance

will be minimized. An area 50 feet in diameter (approximately 2,000 square feet) and 30 feet deep would be required to support the installation of each new set of side-by-side poles. To facilitate the stringing of the transmission line, two 40-foot by 80-foot conductor pulling sites would be used, resulting in approximately 0.15 acre of temporary soil disturbance. Soil disturbance, compaction, and exposure to erosion would result from construction activities associated with the transmission line relocation. Following completion of construction activities, these areas would be reclaimed. Prior to relocation of the transmission line, the National Park Service would be consulted to help determine the guidelines and methodology to be used for soil and plant salvage on affected lands. Therefore, soil impacts associated with construction activities would be short term, minor, and adverse.

An area approximately 4 feet to 6 feet in diameter and 30 feet deep would be occupied by each new tubular steel monopole, resulting in permanent loss of soil productivity over a total of approximately 0.014 acre. Because the area of permanent soil loss would be limited to the footprint of the steel monopoles, long-term impacts on soils would be localized, minor, and adverse. Monopoles associated with the portion of the existing transmission line that would be taken out of service would be removed, along with any concrete structures located above grade. No long-term impacts would be anticipated as a result.

Areas identified for the siting of the relocated transmission line are near an existing maintenance road, but far enough away that smaller access roads would be necessary to support access for construction and periodic maintenance. At this time, the need for three small access roads, each 20 feet wide, has been identified to provide access to monopole locations in moderate terrain. In total, approximately 600 linear feet would be necessary. It is anticipated that the Regional Transportation Commission of Southern Nevada would grade the identified alignments to support the movement of heavy material haul trucks. These dirt roads would be permanent to provide access during periodic maintenance activities.

Impacts on soils associated with the grading of new access roads for construction and maintenance of the transmission line would consist of soil removal, compaction, and exposure to erosion. Over the long term, impacts on soils as a result of the grading of new access roads would be localized, minor, and adverse.

Once in operation, periodic maintenance activities would be necessary. Personnel and vehicles would access these areas using the three small access roads that would be graded as part of the special use permit. Therefore, impacts from the movement of maintenance vehicles would be limited to existing access roads and the immediate vicinity of the transmission line and monopole structures. Therefore, there would be negligible to no impacts on soils associated with operation of the transmission line.

Access Roads Used During Construction and Periodic Maintenance. Vehicles and equipment accessing construction areas during relocation of the transmission line would largely use existing access roads. An existing 20-foot-wide, 0.5-mile long, unpaved transmission line maintenance road extending from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-

of-way, south of the interchange and within Lake Mead NRA would be used to support the movement of heavy material haul trucks associated with the transmission line relocation. The road would also be used for staging certain portions of the relocated transmission line that would be sited adjacent to the road. Use of the existing access roads would have no impact on soils.

Installation of a Waterline to Support Construction Activities. There would be a limited amount of soil disturbance associated with the construction of the waterline, which is anticipated to take two months. The waterline—which would be 6 inches in diameter—would be laid on the surface of the ground following the identified alignment and would not require ground-disturbing activities. In limited locations, sandbags may be placed on top of the waterline to hold it in place, which may further compact soils.

Between two and four intermediate 6 × 6 foot pumps would be intermittently sited adjacent to the waterline to pump water from Lake Mead to the construction staging area. These pumps would be powered by gasoline generators that would be located at each pump. It is anticipated that the generators would run 24 hours per day during peak construction periods. In total, the generators would average 16 hours per day for approximately 300 days per year. A construction action plan would be developed prior to the onset of construction activities to identify spill prevention measures and clean-up procedures should an incident occur.

The waterline would be constructed onsite and materials would be brought to the area by heavy material haul truck. Existing access roads and/or dry wash areas would be used to access the waterline; no new access and/or maintenance roads would be constructed to support the waterline. In areas where existing roads or wash areas are not available, the waterline would be constructed by hand and the intermediate pumps would be lowered into position. These activities could cause some short-term, localized, and negligible, adverse impacts on soils, but impacts will be lessened by the reclamation and de-compaction activities that would occur after the waterline is removed. Overall, adverse impacts associated with the construction of the waterline would be localized and negligible.

The waterline would remain in place while construction of the bypass project is ongoing (an estimated three years). Soil disturbance would occur when maintenance personnel fuel the pumps or if repairs to the waterline or pumps become necessary. Fuel spills in areas surrounding the pumps would also have the potential to adversely impact soils. Because maintenance personnel would access the waterline on foot, and because mitigation measures would be incorporated to prevent spilling of fuel and other fluids, negligible, adverse impacts on soils are anticipated as a result of the operation of the waterline.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact soils include the implementation of the bypass project, construction of the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan. Implementation of the bypass project would permanently alter the productive capacity and natural hydrology of native soils within the project footprint, replacing them with impervious surface. This would result in long-term, major, adverse impacts on soils in affected areas.

Short- and long-term impacts associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of the Low Water Amendment to the Lake Mead NRA General Management Plan would be the same as those described for the no-action alternative. The three elements of the action alternative would contribute short-term, minor, adverse; long-term, negligible to minor, adverse; and long-term, beneficial impacts on soils. Overall, cumulative impacts on soils under the action alternative would be long term, moderate to major, and adverse. The majority of adverse impacts would be associated with construction of the bypass and impacts associated with the action alternative would not represent a notable contribution to the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short-term, minor, adverse and long-term, negligible to minor, adverse impacts on soils as a result of the transmission line relocation. The waterline would result in short-term, negligible, adverse impacts, and access roads would result in short- and long-term, minor, adverse to no impacts on soils.

Impacts associated with the action alternative, in combination with the short- and long-term, minor to moderate, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable future actions would result in a long-term, moderate to major, adverse cumulative impact on soils. The majority of adverse impacts would be associated with construction of the bypass project, and impacts associated with the action alternative would not represent a notable share of the adverse cumulative impact.

IMPACTS ON VEGETATION

Methods and Assumptions

Potential impacts were assessed based on the extent of disturbance to vegetation that would result from the implementation of the action alternative. The analysis is based on a literature review concerning plant species present in and around the project area, review of land cover data and vegetation survey information contained in previous NEPA documentation conducted for the bypass project, and professional judgment of subject-matter experts.

Study Area

The study area for the vegetation impact analysis is contiguous with the project area: the transmission line corridor, access roads, the area surrounding the section of existing transmission line proposed for removal, and the waterline right-of-way. The study area for cumulative impacts includes the project area and the project areas for each respective past, present, or reasonably foreseeable action.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on vegetation that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in the condition or appearance of vegetation or a change that moves toward a desired condition.

An adverse impact is one that results in a change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Some individual native plants could be affected as a result of the alternative, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur. The impacts would be on a small scale.

Minor. The alternative would affect some individual native plants and would also affect a relatively small portion of those species' population. The viability of the plant community would not be affected and the community, if left alone, would recover. Mitigation could be needed to offset adverse impacts, but would be relatively simple to implement and would likely be successful.

Moderate. The alternative would affect native plants over a relatively large area and effects would be readily measurable in terms of abundance, distribution, quantity, or quality. Mitigation needed to offset adverse impacts could be extensive but would likely be successful.

Major. The alternative would have a considerable effect on native plant communities that would be readily apparent, and would substantially change vegetation community types over a large area inside and outside Lake Mead NRA. Mitigation measures to offset the adverse impacts would be required, the measures required would be extensive, and the success of these mitigation measures would not be guaranteed.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline

would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and there would be no new access roads graded. Therefore, the no-action alternative would have no impacts on vegetation.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact vegetation include implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan.

The siting of the bypass project would result in long-term major but localized adverse impacts on vegetation within Lake Mead NRA because it would permanently alter the productive capacity and natural hydrology of native soils within the project footprint, replacing vegetation habitat with impervious surface. Construction of the bypass project would also create potential for the introduction of noxious weeds, although the project would incorporate substantial mitigation measures to minimize the introduction and spread of noxious weeds. The extent and location of these impacts may vary should the alignment need to be refined if the special use permit is not issued.

Ground-disturbing activities associated with the construction of the deep water intake, related facilities, and access road would permanently remove vegetation in localized areas. As a result, both short- and long-term, localized, minor to moderate, adverse impacts on vegetation would result.

On the Historic Railroad Trail, repair of existing trail damage and implementation of erosion control measures would have short-term, negligible to minor, adverse impacts on vegetation. Because stabilization and rehabilitation efforts would mitigate erosion in the future, long-term impacts on vegetation would be beneficial.

The implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan would have effects on vegetation related to localized ground disturbance and removal of desert shrub vegetation during possible extensions of marina access roads and public boat launch ramps. Also, recently exposed soils could provide new habitat for the introduction of early successional invasive weeds in areas of frequent visitor use. Anticipated impacts on vegetation would be short and long term, minor to moderate, and adverse.

Overall, cumulative impacts on vegetation that would result from those actions described above would be short and long term, minor to moderate, and adverse.

Impacts associated with the no-action alternative, in combination with the short- and long-term, moderate and adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate to major, adverse cumulative impact on vegetation in localized areas. The majority of adverse cumulative impacts would result from implementation of the bypass project. The no-action alternative would not contribute to cumulative impacts.

Conclusion. Implementation of the no-action alternative would result in no impacts on vegetation. Impacts associated with the no-action alternative, in combination with the short- and long-term moderate, adverse; long-term, localized, major adverse; and long-term, beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in short- and long-term, moderate to major, adverse cumulative impacts on vegetation. The majority of cumulative adverse impacts would result from construction of the bypass project. The no-action alternative would not contribute to cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on vegetation that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Impacts on vegetation associated with the construction of the transmission line would result from disturbance of native vegetation from the removal in place of existing monopoles, preparation of new monopole sites, and clearing and use of conductor pulling sites. Short-term impacts on vegetation associated with vegetation disturbance during the removal of existing monopoles would be minor and adverse. Site preparation surrounding each monopole location and the clearing and use of conductor pulling sites to facilitate construction of the new transmission line would result in the temporary vegetation disturbance of approximately 0.15 acre.

Prior to relocation of the transmission line, appropriate state and federal agencies (e.g., Nevada Natural Heritage Program and the National Park Service) would be consulted to help determine the guidelines and methodology for soil and plant salvage on affected lands under their regulatory jurisdictions. Short-term vegetation impacts from construction of the relocated monopoles would therefore be minor and adverse. Once construction is complete, each monopole would occupy an area approximately 4 feet to 6 feet in diameter, resulting in the permanent removal of approximately 0.014 acre. Because the permanent removal of vegetation represents such a small share of total land cover within Lake Mead NRA, long-term impacts on vegetation would be negligible and adverse.

Areas identified for the siting of the relocated transmission line are near the maintenance road but far enough away that smaller access roads would be necessary to support access for construction and periodic maintenance activities. At this time, the need for three small access roads, each 20-feet wide, has been identified to provide access to monopole locations in moderate terrain. In total, approximately 600 linear feet would be graded. Vegetation in affected areas would be permanently removed. Therefore, short- and long-term vegetation impacts from the grading of new access roads would be localized, minor to moderate, and adverse.

Once in operation, periodic maintenance of the transmission line would be necessary. It is anticipated that personnel and vehicles would access maintenance areas using the existing 20-foot-wide unpaved transmission line maintenance road and three smaller access roads discussed above

that would be graded as part of the special use permit. Therefore, impacts from the movement of vehicles would be limited to existing access roads and the immediate vicinity of the transmission line and monopole structures. Therefore, no impacts on vegetation are anticipated from operation of the transmission line.

Access Roads Used During Construction and Periodic Maintenance. Vehicles and equipment accessing construction areas during relocation of the transmission line would largely use existing access roads. An existing 20-foot-wide, 0.5-mile-long unpaved transmission line maintenance road extending from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-of-way, south of the interchange and within Lake Mead NRA would be used to support the movement of heavy material haul trucks associated with the transmission line relocation. The road would also be used for staging certain portions of the relocated transmission line that would be sited adjacent to the road. No impacts on vegetation are expected.

Installation of a Waterline to Support Construction Activities. Vegetation impacts from construction of the waterline would result from the disturbance of native vegetation through trampling and ground disturbance by construction personnel and equipment used for site preparation and line placement. Because the area surrounding the proposed waterline alignment is sparsely vegetated and placement of the waterline would not involve ground-disturbing activities, the impacts of waterline construction would be short-term, negligible, and adverse.

Once in operation, vegetation impacts would result from the movement of maintenance personnel accessing the waterline and pumps and from potential fuel spills in the immediate vicinity of the pumps. The area surrounding the proposed waterline is sparsely vegetated, maintenance vehicle access would be restricted to existing roads, and/or maintenance personnel would access the waterline on foot. Mitigation measures would be implemented to minimize spills of fuel and other fluids. Therefore, impacts on vegetation would be short-term, negligible, and adverse.

The waterline would be removed once construction of the bypass project is complete. Therefore, no long-term impacts on vegetation would result.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact vegetation would include the implementation of the bypass project, construction associated with the deep water intake at Lake Mead, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan.

Construction of the bypass project would permanently remove vegetation and available habitat within the project footprint, resulting in long-term major adverse but localized impacts on vegetation. Short- and long-term impacts associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA General Management Plan would be the same as those described for the no-action alternative.

The action alternative would contribute short-term minor adverse impacts in areas affected by removal in place of existing monopoles, preparation of new monopole sites, and conductor pulling sites. Long-term, minor to moderate, adverse impacts would result from the permanent removal of vegetation for the grading of access roads and placement of monopoles. Overall, cumulative impacts on vegetation under would be long-term, moderate to major, and adverse. The majority of adverse cumulative impacts would result from implementation of the bypass project. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short-term, negligible, adverse impacts on vegetation associated with the waterline; short-term, minor, adverse and long-term, negligible, adverse impacts as a result of the transmission line relocation; and short- and long-term, minor to moderate, adverse impacts from access roads. The action alternative would result in long-term, moderate to major, adverse cumulative impacts on vegetation. The majority of adverse cumulative impacts would result from the implementation of the bypass project. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

IMPACTS ON FISH AND WILDLIFE AND THEIR HABITATS

Methods and Assumptions

Potential impacts were assessed based on the extent of disturbance to fish and wildlife that would result from the implementation of the action alternative. The analysis is based on a literature review concerning fish and wildlife species present in and around the project area, review of known distributions of fish and wildlife species, survey information contained in previous NEPA documentation conducted for the bypass project, several field visits, and professional judgment of subject-matter experts.

Study Area

The study area for the fish and wildlife impact analysis includes the transmission line corridor, access roads, the area surrounding the section of existing transmission line proposed for removal, and the waterline right-of-way, including the area where the barge and pump would be situated in Lake Mead The study area for cumulative impacts includes the project area and the project areas for each respective past, present, or reasonably foreseeable action.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on fish and wildlife that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in the condition of fish and wildlife populations or a change that moves toward a desired condition.

An adverse impact is one that results in a change that declines, degrades, and/or moves the fish and wildlife resources away from a desired condition or from population goals. Adverse impacts are

further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Some native fish or wildlife individuals could be affected as a result of the alternative, but measurable or perceptible changes in a species population size would not occur. The impacts would be on a small scale.

Minor. The alternative would affect some native fish or wildlife individuals and would also affect a relatively small portion of those species' population. The viability of that species' population would not be affected, and the population would recover without human intervention. Mitigation could be needed to offset adverse impacts, but would be relatively simple to implement and would likely be successful.

Moderate. The alternative would affect a portion of a native species' local population over a relatively large area and effects would be readily measurable in terms of abundance, distribution, quantity, or quality. Mitigation needed to offset adverse impacts could be extensive but would likely be successful.

Major. The alternative would have a considerable effect on a native species' local population, would be readily apparent, and would substantially change the species' population over a large area inside and outside Lake Mead NRA. Mitigation measures to offset the adverse impacts would be required and would be extensive; the success of these mitigation measures would not be guaranteed.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and there would be no new access roads graded. Therefore, the no-action alternative would have no impacts on fish and wildlife populations, including the potentially occurring federally and state-listed species (razorback sucker, desert tortoise, common chuckwalla, Gila monster, desert bighorn sheep, and several bat species).

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact local fish and wildlife populations (including potentially occurring listed species) include the

implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan.

The siting of the bypass project would result in long-term major but localized adverse impacts on local wildlife populations within Lake Mead NRA because it could permanently alter the species current phenology (e.g., local migration routes, lambing areas, burrow locations) by fragmenting habitat with a permanent barrier. Also, soils and vegetation would be replaced by impervious surfaces, which could alter hydrology, increase sedimentation, and potentially introduce noxious weeds, which could alter the phenology of local fish and wildlife populations, especially the federally and state-listed species. The extent and location of these impacts may vary should the alignment need to be refined if the special use permit is not issued. Ground-disturbing activities associated with the construction of the deep water intake, related facilities, and access road would permanently remove habitats in localized areas. As a result, both short- and long-term, localized, minor adverse impacts on fish and wildlife, including those potentially occurring federally and state-listed species would result.

On the Historic Railroad Trail, repair of existing trail damage and implementation of erosion control measures could have short-term, negligible to minor, adverse impacts on the state-listed bat species. While Mexican free-tailed bats (*Tadarida brasiliensis*) use the historic trail tunnels as summer roosts (Boyles 2014), trail repair would be scheduled for winter months. Because stabilization and rehabilitation efforts would mitigate erosion in the future, long-term impacts on fish and wildlife (especially the potentially occurring listed species) would be beneficial. Any sedimentation from trail reconstruction would not affect razorback sucker spawning locations, which are known to occur far away from this micro-watershed. Overall, cumulative impacts that would result from those actions described above would be short-term, negligible, and adverse and long-term, beneficial.

The implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan would primarily affect the conversion of habitat for fish and wildlife species. Habitats for fish species would continue to shrink, which could negatively affect spawning or feeding sites. Potential habitats for terrestrial wildlife species would grow in size and could be vegetated with early successional invasive species. Both fish and wildlife species could be negatively affected when recreationalists access the shoreline because an increase in vehicles/boats and localized litter could occur. However, these long-term, adverse impacts on wildlife species would continue to occur even under the no-action alternative.

The absence of impacts associated with the no-action alternative, in combination with the short- and long-term, localized, minor, and adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, minor, adverse cumulative impact on fish and wildlife species (including the listed species) in localized areas. The majority of adverse cumulative impacts would result from implementation of the bypass project. The no-action alternative would not contribute to cumulative impacts.

Conclusion. The no-action alternative would have no impacts on fish and wildlife populations (including the listed species) nor would it contribute to cumulative impacts on fish and wildlife (including listed species).

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under alternative 1, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on fish and wildlife (and listed species) that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Impacts on wildlife species (and listed species) associated with transmission line construction would result from disturbance of local wildlife (and listed species) populations from the removal of existing monopoles, preparation of new monopole sites and installation of structures, and clearing and use of conductor pulling sites. Short-term impacts on wildlife species (and listed species) associated with habitat disturbance during the removal of existing monopoles would be minor and adverse. Site preparation surrounding each monopole location and the clearing and use of conductor pulling sites to facilitate construction of the new transmission line would result in a temporary habitat disturbance of approximately 0.15 acre. There is not expected to be any adverse sedimentation impacts on listed and non-listed fish species in the Colorado River or Lake Mead.

Short-term wildlife (and listed species) impacts from construction of the relocated monopoles would therefore be minor and adverse from increased disturbance from helicopters, construction equipment, and construction personnel. Once construction is complete, each monopole would occupy an area approximately 4 feet to 6 feet in diameter, resulting in the permanent removal of approximately 0.014 acre of habitat. Because the permanent removal of habitat represents such a small share of total land cover within Lake Mead NRA, long-term impacts on wildlife (and listed species) would be negligible and adverse. No fish impacts are expected from construction of the monopoles.

Other areas identified for the siting of the relocated transmission line are near the maintenance road but far enough away that smaller access roads would be necessary to support access for construction and periodic maintenance. At this time, the need for three smaller access roads, each 20-feet-wide, has been identified to provide access to monopole locations in moderate terrain. In total, approximately 600 linear feet would be graded. Wildlife (and listed species) habitat in affected areas would be permanently removed. Therefore, short- and long-term impacts on wildlife (and listed species) from the grading of new access roads would be localized, minor, and adverse. Sedimentation from these roads is not expected to reach the Colorado River; therefore, fish species (listed and non-listed) would not be affected.

Once in operation, periodic maintenance of the transmission line would be necessary. It is anticipated that personnel and vehicles would access maintenance areas using the existing 20-foot-

wide unpaved transmission line maintenance road and three smaller access roads. Impacts from the movement of vehicles would be limited to existing access roads and the immediate vicinity of the transmission line and monopole structures. Therefore, no impacts on fish and wildlife (and listed species) and their habitats are anticipated from operation of the transmission line.

Access Roads Used During Construction and Periodic Maintenance. Vehicles and equipment accessing construction areas during construction of the bypass project and relocation of the transmission line would largely use existing access roads. An existing 20-foot-wide, 0.5-mile long unpaved transmission line maintenance road extending from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-of-way, south of the interchange and within Lake Mead NRA would be used to support the movement of heavy material haul trucks associated with the transmission line relocation. The road would also be used for staging certain portions of the relocated transmission line that would be sited adjacent to the road.

No additional removal of wildlife (listed and non-listed species) habitat is anticipated as a result of access road use. However, there could be some limited mortality of listed and non-listed wildlife species as a result of increased construction vehicle traffic, although any mortality would not affect the local species population viability. Overall, short-term, negligible to minor, adverse impacts on listed and non-listed fish and wildlife species and their habitats would result.

Installation of a Waterline to Support Construction Activities. Minor habitat impacts from the construction of the waterline would result from the disturbance of native vegetation through trampling and ground disturbance by construction personnel and equipment used for site preparation and line placement. Because the area surrounding the proposed waterline alignment is sparsely vegetated and placement of the waterline would not involve ground-disturbing activities, impacts of waterline construction on listed and non-listed wildlife species would be short-term, negligible, and adverse and limited to the temporary disturbance and displacement of wildlife. The installation of a barge, pump, and waterline in Lake Mead would introduce a new, temporary barrier to the aquatic environment; however, given the volume of the lake, total size of this impact area, and screen on the waterline, impacts on listed and non-listed fish species would also be short-term, negligible, and adverse.

Once in operation, minor impacts on listed and non-listed fish and wildlife habitat would result from the movement of maintenance personnel accessing the waterline and pumps, and from potential fuel spills in the immediate vicinity of the pumps. The area surrounding the proposed waterline is sparsely vegetated; maintenance vehicle access would be restricted to existing roads and/or maintenance personnel would access the waterline on foot. Mitigation measures would be implemented to minimize spills of fuel and other fluids. Therefore, impacts on listed and non-listed fish and wildlife and their habitats would be short-term, negligible, and adverse.

The waterline would be removed once construction of the bypass project is complete. Therefore, no long-term impacts on listed and non-listed fish and wildlife species and their habitats would result.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact listed and non-listed fish and wildlife populations and their habitats would include the implementation of the bypass project, construction associated with the deep water intake at Lake Mead, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan. Construction of the bypass project would permanently remove available habitats within the project footprint, resulting in long-term, moderate, adverse but localized impacts on listed and non-listed wildlife species habitats. Sedimentation from the bypass project's construction is not expected to reach either Lake Mead or the Colorado River, which would result in no impacts on listed or non-listed fish species. Short- and long-term impacts associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of the Low Water Amendment to the Lake Mead General Management Plan would be the same as those described for the no-action alternative.

The action alternative would contribute short-term minor adverse impacts in areas affected by removal in place of existing monopoles, preparation of new monopole sites, and conductor pulling sites. Long-term minor to moderate adverse impacts would result from the permanent removal of listed and non-listed wildlife habitat for the grading of access roads and placement of monopoles. Overall, cumulative impacts on listed and non-listed wildlife habitats under the action alternative would be long-term, moderate, and adverse. Overall, cumulative impacts on listed and non-listed fish species and their habitats under the action alternative would be short-term, negligible, and adverse and long-term, beneficial. The majority of adverse cumulative impacts would result from implementation of the bypass project. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short-term, minor, adverse and long-term, negligible, adverse impacts on listed and non-listed wildlife species and no impacts on listed and non-listed fish species as a result of the transmission line relocation. The construction of the maintenance road would result in short- and long-term, minor, adverse impacts on listed and non-listed wildlife species and no impacts on listed and non-listed fish species. Installation of the waterline would result in short-term, negligible, and adverse impacts on listed and non-listed fish and wildlife species and their habitats. The action alternative would result in long-term, moderate, adverse cumulative impacts on listed and non-listed wildlife habitats and short-term, negligible, and adverse and long-term, beneficial on listed and non-listed fish habitats. The majority of adverse cumulative impacts would result from the implementation of the bypass project. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

IMPACTS ON WATER RESOURCES

Methods and Assumptions

Potential impacts were assessed based on the extent of disturbance to water resources. The analysis is based on the identification of water resources in the study area, activities associated with the

construction and operation of the action alternative, and professional judgment of subject-matter experts.

Study Area

The study area for the water resources impact analysis includes the transmission line corridor, access roads, the area surrounding the section of existing transmission line that would be taken out of service, and the waterline right-of-way, including localized areas of Lake Mead. The study area for cumulative impacts includes the project area and the project areas for each respective past, present, or reasonably foreseeable action.

Impact Definitions

The following impact thresholds were established for analyzing impacts on water resources in the study area that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in the condition of water resources or a change that moves toward a desired condition.

An adverse impact is one that results in a change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Effects are discountable and are well within water quality standards and/or historical ambient or desired water quality conditions.

Minor. Effects are detectable but within water quality standards and/or historical ambient or desired water quality conditions.

Moderate. Effects are detectable and within water quality standards, but historical baseline or desired water quality conditions are being altered on a short-term basis.

Major. Effects are detectable and significantly and persistently alter historical baseline or desired water quality conditions. Limits of water quality standards are locally approached, equaled, or slightly singularly exceeded on a short-term and temporary basis.

Duration. Short-impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and no new access roads would be graded. The condition of water resources within the project area would remain unchanged. Therefore, the no-action alternative would have a negligible impact on water resources.

The no-action alternative would have a negligible impact on surface water, ground water, water quality, and waters of the United States.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact water resources include the implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan. The siting of the bypass project would result in long-term minor impacts on water resources in the immediate near-road environment from non-point source runoff into existing ephemeral washes from contaminants in runoff from roads. Construction of the bypass project would result in short-term, negligible to minor impacts from erosion as a result of soil disturbance. This would be mitigated through the Stormwater Pollution Prevention Plan implemented prior to construction.

Ground-disturbing activities associated with construction of the deep water intake, related facilities, and access roads would have short-term, negligible to minor, adverse impacts on water quality. The presence of permanent facilities and access roads associated with operation of the intake would have long-term, negligible to minor, adverse impacts on water quality associated with road non-point source runoff.

On the Historic Railroad Trail, repair of existing trail damage and implementation of erosion control measures would have short-term, negligible to minor, adverse impacts on water quality resulting from construction runoff. Because stabilization and rehabilitation efforts would reduce erosion in the future, long-term impacts on water quality would be beneficial.

The implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan would have effects on water quality within localized areas because more soil would be exposed from the receding water levels and soil disturbance (e.g., sedimentation) would occur as a result of possible extensions of marina access roads and public boat launch ramps. In addition, a reduction in lake volumes would decrease the dilution of sediments or chemicals. As a result, adverse impacts on water quality would be minor to moderate and short term and long term.

Impacts associated with the no-action alternative, in combination with the short- and long-term, localized, negligible to minor, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, negligible to minor, adverse

cumulative impact on water resources. The no-action alternative would not contribute to cumulative impacts.

Conclusion. The no-action alternative would have no direct impact on water resources nor would it contribute to cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under alternative 1, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three alternative elements. Impacts on water resources that would result from the three alternative elements are described below.

The action alternative would have a negligible impact on surface water, ground water, and waters of the United States.

Potential short-term construction-related water quality impacts from the issuance of the special use permit would include erosion and runoff from construction activities that involve ground disturbance, such as relocating the transmission line, constructing access roads, and installing the waterline. Construction water quality impacts are expected to be short-term, localized, and minor (only occurring during active construction), and controlled as practicable with the implementation of an approved Stormwater Pollution Prevention Plan.

Transmission Line Relocation. Impacts on water resources associated with the relocation and construction of the transmission line could result from erosion caused by the temporary disturbance of soil during site preparation of each monopole location and the clearing and use of conductor pulling sites to facilitate construction of the new transmission line. Potential short-term construction-related water quality impacts include erosion and runoff from construction activities that involve ground disturbance. Construction water quality impacts are expected to be short-term, localized, and minor (only occurring during active construction), and controlled as practicable with the implementation of an approved Stormwater Pollution Prevention Plan.

Short-term impacts on water quality from removal of the existing transmission line structures would be negligible to minor and adverse; however, long-term impacts would be beneficial because transmission towers would be removed from existing drainages and areas previously occupied by transmission line towers would be reclaimed. Site preparation surrounding each tower and the clearing and use of pulling sites associated with construction of the new transmission line monopoles would result in potential erosion. Prior to relocation of the transmission line, a Stormwater Pollution Prevention Plan would be prepared and implemented. Once constructed, each monopole would occupy an area approximately 4 feet to 6 feet in diameter, resulting in the permanent removal of approximately 0.014 acre. Because the permanent removal of this area represents such a small share of total land cover within Lake Mead NRA, long-term impacts on water resources would be negligible.

Once in operation, periodic maintenance activities would be necessary. It is anticipated that personnel and vehicles would access maintenance areas using the existing 20-foot-wide unpaved transmission line maintenance road and three smaller access roads that would be graded as part of the special use permit. Impacts from the movement of vehicles would be limited to existing access roads and the immediate vicinity of the transmission line and monopole structures. Therefore, no impacts on water quality are anticipated from operation of the transmission line.

Access Roads Used During Construction and Periodic Maintenance. To the extent feasible, existing unpaved roads would be used to access construction areas. As necessary, new permanent unpaved access roads would be constructed from the nearest access road to the base of each monopole, which would result in the disturbance of soils and the potential for erosion and runoff in areas occupied by new access roads. Short- and long-term water quality impacts from the construction of access roads would be negligible to minor.

Because maintenance and repair access to the transmission line right-of-way would be intermittent, infrequent, and limited to responses to power outages, and would use existing permanent access roads, no impacts on water quality are anticipated from access roads during operation of the line.

Installation of a Waterline to Support Construction Activities. Water resource impacts from construction of the waterline would result from erosion and runoff from construction equipment used for site preparation and line placement. The waterline would be placed within the existing stream bed of the wash and placement of the waterline would not involve excavation. The impacts of waterline construction would be short-term, negligible, and adverse.

Water resource impacts from the operation of the waterline would result from the movement of maintenance personnel accessing the waterline and pumps, and from potential fuel spills in the immediate vicinity of the pumps. The area surrounding the waterline is sparsely vegetated, maintenance vehicle access would be restricted to existing roads, and maintenance personnel would access the waterline on foot. Mitigation measures would be implemented through a Stormwater Pollution Prevention Plan to minimize spills of fuel and other fluids. Therefore, impacts on vegetation would be short-term, negligible, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact water resources would include the implementation of the bypass project, construction associated with the deep water intake at Lake Mead, stabilization and rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA General Management Plan.

The action alternative would contribute short-term, negligible to minor, adverse impacts in areas affected by removal in place of existing monopoles, preparation of new monopole sites, and conductor pulling sites and could cause erosion and runoff in these areas. Long-term, negligible to minor, adverse impacts could result from access road grading and monopoles placement. Impacts associated with the deep water intake at Lake Mead, stabilization and rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA General Management Plan would be similar to those described for the no action alternative above. Overall, cumulative impacts

on water resources under the action alternative would be negligible to minor. The majority of adverse cumulative impacts would result from implementation of the bypass project. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short-term, negligible to minor, adverse impacts on water resources associated with the waterline; short-term, negligible to minor, adverse; long-term, negligible to minor, adverse; and long-term, beneficial impacts as a result of the transmission line relocation; and short- and long-term, negligible to minor, adverse impacts from access roads. The action alternative would result in long-term, negligible to minor, adverse cumulative impacts on water resources. The majority of adverse cumulative impacts would result from the implementation of the bypass project and impacts associated with the no-action alternative would not represent a notable share of the adverse cumulative impact.

The Stormwater Pollution Prevention Plan would include measures such as installing silt fencing and/or other erosion control measures around stockpiled fill material; ensuring proper storage, use, and disposal of fuels and other chemicals; installing flags, markers, and/or temporary fences prior to construction activities to avoid soil disturbance outside of the work area; and minimizing access routes for construction vehicles to prevent tracking of sediments to ensure the area of disturbance is minimized.

IMPACTS ON AIR QUALITY

Methods and Assumptions

The air quality impact analysis is based on a qualitative assessment of emissions caused by the construction and operation of the action alternative, taking into account existing air quality conditions and mitigation measures required by permit conditions (such as dust control measures).

Study Area

The study area for the air quality analysis includes the area within 0.25 mile of each of the three project elements associated with the special use permit. This is the area where localized air quality impacts during construction would be most likely to occur. The same study area is used for the cumulative impact analysis.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on air quality that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in air quality.

Negligible. There are no visible impacts, and there is no smell of emissions. Impacts are well below air quality standards or criteria and are within historic or desired air quality conditions.

Minor. There are visible impacts during brief periods of time. Dust from the use of dirt roads is visible during brief periods. Impacts are detectable, but are below air quality standards or criteria and within historic or desired air quality conditions. Mitigation alleviates the impacts.

Moderate. There are visible impacts during extended periods. Dust from the use of dirt roads is visible for an extended area. Impacts are detectable, but are at or below air quality standards or criteria and within historic or desired air quality conditions. Mitigation alleviates the impacts.

Major. Visible impacts are detectable for extended periods of time in a large area. Dust from the use of dirt roads and equipment is visible for an extended amount of time. Impacts are detectable; air quality is frequently altered from the historical baseline or desired air quality conditions; air quality standards or criteria are frequently and/or continuously exceeded. Mitigation is unable to alleviate the conditions.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the three elements associated with the special use permit would not occur and there would be no project-induced impacts on air quality.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact air quality include implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan. The siting of the bypass project would result in long-term minor impacts on air quality in the immediate near-road environment from automobile and truck traffic emissions, and generation of fugitive dust. Construction of the bypass project would result in short-term, moderate, and adverse impacts from dust and equipment emissions (mitigated as appropriate consistent with the environmental commitments of the Record of Decision).

Ground-disturbing work associated with construction of the deep water intake, related facilities, and access roads would have short-term minor but localized adverse impacts related to dust from ground-disturbing activities and emissions from construction vehicles and equipment. The presence of permanent facilities and access roads associated with operation of the intake would therefore have long-term, negligible, adverse impacts on air quality associated with road dust and vehicle travel.

Implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan would have short-term, minor but localized, adverse impacts on air quality related to dust from ground-disturbing activities and emissions from construction vehicles and equipment. No long-term adverse impacts would be expected.

On the Historic Railroad Trail, repair of existing trail damage and implementation of erosion control measures would have short-term, negligible, adverse impacts on air quality resulting from fugitive dust. Because stabilization and rehabilitation efforts would reduce dust generation in the future, long-term impacts on air quality would be beneficial.

Impacts associated with the no-action alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in short-term, negligible to moderate and long-term, negligible to minor, adverse cumulative impacts on air quality. The no-action alternative would not contribute to cumulative impacts.

Conclusion. The no-action alternative would have no direct impact on air quality. Impacts associated with the no-action alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in short-term, negligible to moderate and long-term, negligible to minor, adverse cumulative impacts on air quality. The no-action alternative would not contribute to cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Construction air quality impacts are expected to be localized, minor, temporary (only occurring during active construction), and controlled as practicable. Construction activities would require a dust control permit from Clark County, which would also include a dust control mitigation plan. The dust control mitigation plan would include measures such as the use of periodic dust suppression with water, covering piles of loose materials, and fencing to ensure the area of disturbance is kept to the minimum necessary. Impacts on air quality that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Removal of the aboveground portion of existing transmission line structures and construction of new structures would result in short-term, minor, adverse impacts from dust and construction equipment emissions. Particulate matter, carbon monoxide, and ozone precursors (volatile organic compounds and nitrogen oxides) would also be emitted by construction equipment, including helicopters used for transmission line construction.

The transmission line itself creates limited air emissions under existing conditions and would continue to generate limited emissions after being relocated. The high electric field strength of transmission lines causes a breakdown of air at the surface of the conductors called corona. Corona has a popping sound that is most easily heard during rainstorms. When corona occurs, amounts of

ozone and nitrogen oxides are released in such small quantities that they are generally too small to be measured or to have any significant effect on humans, plants, or animals (BPA 2009). Corona-related air quality impacts would be long-term, negligible, and adverse. No other air quality impacts would result from the operation of the transmission line.

Vehicles and equipment accessing construction areas during relocation of the transmission line would largely use existing access roads. An existing 20-foot-wide, 0.5-mile-long unpaved transmission line maintenance road extending from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-of-way, south of the interchange and within Lake Mead NRA would be used to support the movement of heavy material haul trucks associated with the transmission line relocation. The road would also be used for staging certain portions of the relocated transmission line that would be sited adjacent to the road.

Other areas identified for the siting of the relocated transmission line are near the maintenance road but far enough away that smaller access roads would be necessary to support access for construction and periodic maintenance activities. At this time, the need for three smaller access roads, each 20-feetwide, has been identified to provide access to monopole locations in moderate terrain. In total, approximately 600 linear feet would be necessary. It is anticipated that the Regional Transportation Commission of Southern Nevada would grade the identified alignments to support the movement of heavy material haul trucks. These dirt roads would be permanent to provide access during periodic maintenance activities. Grading of access roads would result in short-term, minor, adverse impacts on air quality, primarily associated with dust. Particulate matter, carbon monoxide, and ozone precursors (volatile organic compounds and nitrogen oxides) would also be emitted by construction equipment. The access roads would be infrequently used; consequently mobile source emissions in the long term would result in negligible, adverse impacts.

Access Roads Used During Construction and Periodic Maintenance. Fifty trucks per day would use the existing maintenance road during construction of the bypass project. Particulate matter (direct emissions and fugitive dust) and nitrogen oxides would be the primary pollutants generated by this activity. Air quality impacts from use of the existing maintenance road would be localized, minor, temporary (only occurring during active construction), and controlled as practicable.

Installation of a Waterline to Support Construction Activities. Construction of the waterline would result in temporary emissions from construction equipment and dust. Particulate matter, carbon monoxide, and ozone precursors (volatile organic compounds and nitrogen oxides) would be emitted by construction equipment.

Water pumps powered with gasoline generators would be necessary to move water through the waterline. Gasoline generators would be located at the intake barge and at each of two to four booster pumps. The generators would run 24 hours per day during peak construction times, averaging about 16 hours per day for about 300 days per year. The emissions generated by gasoline generators would include carbon monoxide, ozone precursors (volatile organic compounds), and small amounts of particulate matter. Concentrations of pollutants would be elevated above background levels in the immediate vicinity of the generators when they are operating, but would quickly drop to ambient levels with increasing distance and would not exceed the National Ambient

Air Quality Standards. There are no specific sensitive receptors or visitor use areas near the generators and no noticeable change in visibility is anticipated. Overall, impacts from the use of the generators would be short-term (lasting for three years), minor, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions are the same as those described for the no-action alternative. Impacts associated with the action alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in short-term, minor to moderate and long-term, negligible to minor, adverse cumulative impacts on air quality. However, the action alternative would contribute to cumulative impacts in a minimal way.

Conclusion. The action alternative would have short-term minor adverse impacts on air quality during construction and operation of gasoline generators for the waterline, grading of access roads, and relocation of the transmission line. The action alternative would have long-term, negligible, adverse impacts from transmission corona effects and occasional use of access roads. Impacts associated with the action alternative, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in short-term, minor to moderate and long-term, negligible to minor, adverse cumulative impacts on air quality as a result of fossil fuel emissions and particulate matter.

IMPACTS ON SOUNDSCAPES

Methods and Assumptions

The methodology used for assessing noise impacts included field observations of noise conditions in the study area by project team staff and best professional judgment based on knowledge of the noise impacts typically expected to be associated with transmission line construction and operation, access road grading, and waterline construction and operation.

Study Area

The study area for the noise impact analysis is the area within approximately 1 mile of the project area. This is the expected distance from which noise from helicopters and blasting associated with construction of the transmission line and helicopter noise associated with periodic maintenance of the transmission line would be audible. Other noise associated with construction and operation of the transmission line, access roads, and waterline would not be expected to extend beyond the distance at which helicopters and blasting would be audible; therefore, a 1-mile distance from the three elements of the alternative associated with the special use permit would be expected to encompass all noise impacts associated with the action alternative. The same study area is used for cumulative impacts analysis.

Impact Definitions

The following definitions were used to assess the intensity of noise impacts. Adverse impacts on noise may result from project alternatives as well as their duration, at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in noise levels.

An adverse impact is one that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Noise would rarely be greater than natural ambient sound levels and/or there would usually be lengthy periods between noise events. Noise in a specific area would rarely result in a value for any noise metric that is more than a very small increment above the value for natural ambient sounds in the same area. Natural sounds would predominate.

Minor. Noise would be greater than natural ambient sound levels for a small portion of the day and/or there would often be substantial periods each day between noise events. Noise in a specific area would rarely result in a value for any noise metric that is more than a small increment above the value for natural ambient sounds in the same area.

Moderate. Noise would be greater than natural ambient sound levels for an intermediate portion of the day and/or there would rarely be more than intermediate periods each day between noise events. Noise in a specific area would rarely result in a value for any noise metric that is more than an intermediate increment above the value for natural ambient sounds in the same area.

Major. Noise would be greater than natural ambient sound levels for a large portion of the day and/or there would rarely be more than short periods each day between noise events. Noise in a specific area would often result in a value for a noise metric that is more than an intermediate increment above the value for natural ambient sounds in the same area.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline

would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and no new access roads would be graded. Therefore, the no-action alternative would not result in noise impacts.

Cumulative Impacts. Past, present, and reasonably foreseeable actions that could result in noise impacts include the implementation of the bypass project, construction of the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan. The siting of the bypass project would result in short-term moderate to major yet localized adverse noise impacts because vehicles and equipment associated with construction activities would elevate noise levels above natural ambient sound levels when such activities are ongoing (which could occur during daylight and night hours.). The extent and location of these impacts may vary should the alignment need to be refined if the special use permit is not issued. Because traffic using the bypass project would contribute incrementally to noise levels that are above natural ambient levels for large portions of the day, long-term noise impacts associated with the bypass project would be minor to moderate and adverse.

Construction of the deep water intake would have short-term minor to moderate but localized adverse noise impacts because equipment and vehicles used in construction of the intake and related access roads would elevate noise levels in the immediate vicinity of such activities above natural ambient levels for an intermediate portion of the day. Over the long term, operation of the deep water intake would have localized, negligible to minor, and adverse noise impacts because mechanical equipment would create sound levels that are slightly elevated above existing conditions.

Implementation of actions associated with the Low Water Amendment to the Lake Mead NRA General Management Plan would have localized, short-term, minor to moderate, adverse impacts on soundscapes resulting from operation of construction vehicles and equipment during alterations to existing marina facilities and construction of access roads.

Repair of existing trail damage and placement of erosion control measures on the Historic Railroad Trail would have short-term, negligible to minor, adverse noise impacts, because personnel associated with trail repair and rehabilitation would be expected to perform work on foot with hand tools. No long-term noise impacts would be associated with the rehabilitation of the Historic Railroad Trail.

Impacts associated with the no-action alternative, in combination with the short-term, localized, negligible to major, adverse and long-term, negligible to moderate, adverse impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major, and long-term, minor to moderate cumulative noise impacts. The majority of adverse cumulative impacts would result from the implementation of the bypass project. The no-action alternative would not contribute to cumulative impacts.

Conclusion. Implementation of the no-action alternative would not result in noise impacts. Impacts associated with the no-action alternative, in combination with the impacts of other past, present, and

reasonably foreseeable actions, would result in short-term, moderate to major and long-term, minor to moderate cumulative noise impacts. However, the no-action alternative would not contribute to cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on soundscapes that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Relocation of the transmission line and decommissioning of the existing transmission line would generate noise in the study area. Activities that would generate nose include transmission line structure site preparation, removal in place of existing transmission line structures, construction of new transmission line structures, and stringing of conductors. Transmission line structure site preparation would use conventional construction equipment such as bulldozers, heavy material haul trucks, cranes, and graders. Construction of transmission line structures would require the use of a helicopter in areas that are too steep to access with conventional construction vehicles and equipment. Noise levels associated with equipment similar to that likely to be used for implementation of the transmission line are identified in table 8.

TABLE 8. NOISE LEVELS PRODUCED BY TYPICAL CONSTRUCTION EQUIPMENT

Type of Equipment	Maximum Level (dBA) at 50 Feet
Helicopter	92
Road Grader	85
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Crane	85
Combined Equipment	89

Source: Thalheimer 1996; USFS 2014

It is expected that helicopters used to place transmission line structures in areas that are too steep to reach with conventional construction equipment could be audible for up to a mile from the

construction area (USFS 2014). However, helicopter use and associated noise in the study area is already high as a result of helicopter flights for tourism. Possible occasional midday blasting may be required at some structure sites in rocky areas where conventional excavation of structure footings would not be practical. Blasting would produce a short noise like a thunderclap that could be audible for up to 1 mile from the affected area, although blasting pads would likely be used to reduce the sound of blasting and the release of debris. Overall, adverse noise impacts from equipment use and blasting during construction of the transmission line would be short-term and moderate.

Areas identified for the siting of the relocated transmission line are near the maintenance road but far enough away that smaller access roads would be necessary to support access for construction and periodic maintenance activities. At this time, the need for three small access roads, each 20-feet-wide, has been identified to provide access to monopole locations in moderate terrain. In total, approximately 600 linear feet would be necessary. It is anticipated that the Regional Transportation Commission of Southern Nevada would grade the identified alignments to support the movement of heavy material haul trucks. These roads would be permanent to provide access during periodic maintenance activities.

Access road construction would have noise impacts similar to those described for construction of the transmission line above, resulting from construction vehicles and equipment. Noise impacts associated with use and grading of any new access roads would be short-term, localized, minor, and adverse.

Noise impacts from operation of the transmission line would be associated with periodic maintenance activities, including the use of helicopters to inspect the transmission line and corona noise from transmission lines. However, these impacts would not be different from current maintenance activities. Because the transmission line would be sited near a number of other transmission lines and involves decommissioning one line and constructing a similar line, corona noise from the relocated transmission line would not be expected to create a perceptible increase in noise levels. Noise levels associated with periodic maintenance activities would likely be similar to those described under the affected environment. Helicopter use would likewise be infrequent, occurring two times to three times annually. As a result, operation of the transmission line is expected to result in long-term, negligible, and adverse noise impacts.

Access Roads Used During Construction and Periodic Maintenance. Vehicles and equipment accessing bypass project construction areas would largely use existing access roads. An existing 20-foot-wide, 0.5-mile long unpaved transmission line maintenance road extending from the US Highway 93/Hoover Dam interchange at SR 172 to the bypass project's right-of-way, south of the interchange and within Lake Mead NRA would be used to support the movement of heavy material haul trucks associated with the transmission line relocation. The road would also be used for staging certain portions of the relocated transmission line that would be sited adjacent to the road.

The use of access roads throughout the life cycle of the transmission line to conduct periodic maintenance activities would be infrequent. Long-term impacts associated with the use of the access roads during operation of the transmission line would be negligible to none.

Installation of a Temporary Waterline to Support Construction Activities. Noise impacts from construction of the waterline would occur from the use of heavy material haul trucks, construction equipment, and personnel used to place the waterline and pumps. Given the anticipated two-month duration of construction and the fact that ground-disturbing activities would not be required, noise impacts are expected to be short-term, negligible to minor, and adverse.

Noise impacts from the operation of the waterline would result from the operation of a pump located near the Las Vegas Boat Harbor and Lake Mead Marina; three to four additional pumps installed at intermediate locations along the 2-mile length of the waterline; and vehicles and personnel associated with operation and maintenance of the pumps. Noise from the barge-mounted pump at Lake Mead would be perceptible to marina users; however, the barge used for the waterline intake would be sited at a sufficient distance from the marina to minimize noise impacts. The intermediate pumps are not expected to affect any sensitive receptors. Vehicle use and personnel related to the operation and maintenance of the waterline are expected to be limited. Operation of the pumps would likely occur 24 hours per day throughout the duration of construction for the US 93 Bypass. Noise impacts from operation of the waterline would be short-term, minor, and adverse. Over the long term, the waterline would be removed. Therefore, no long term noise impacts would result.

Cumulative Impacts. Past, present, and reasonably foreseeable actions that could result in noise impacts include the implementation of the bypass project, construction of the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP. Construction of the bypass project is expected to involve the continued use of heavy construction equipment and vehicles for large portions of the day for a period of three years. Therefore, short-term, moderate to major, localized, adverse noise impacts would result. Long-term noise impacts associated with the bypass project would be similar to those discussed for the no-action alternative and would be minor to moderate and adverse.

Noise impacts associated with construction and operation of the deep water intake, repair and rehabilitation of the Historic Railroad Trail, and implementation of the Low Water Amendment to the Lake Mead NRA GMP would be similar to those described for the no-action alternative. The majority of adverse cumulative impacts would result from construction of the bypass project. Impacts associated with the action alternative would not represent a notable share of the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short-term, minor to moderate, adverse impacts and long-term, negligible, adverse noise impacts. Impacts associated with the action alternative, in combination with the short-term, localized, negligible to major, adverse impacts and long-term, negligible to moderate, adverse impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major and long-term, minor to moderate cumulative noise impacts.

IMPACTS ON CULTURAL RESOURCES

Methods and Assumptions

Potential impacts were assessed based on the extent of disturbance to cultural resources that would result from the implementation of the action alternative. The analysis is based on a summary of cultural resources documented within the project's area of potential effects and in the project vicinity. A Class III cultural resources inventory included pre-field records and literature review and a pedestrian survey along the entire linear study area to identify and document cultural resources that could be affected by the project.

Study Area

The study area for the cultural resources impact analysis includes the transmission line corridor, access roads, the area surrounding the section of existing transmission line that would be taken out of service, and the waterline right-of-way, including localized areas of Lake Mead. The study area for cumulative impacts includes the same area as well as the project areas for other past, present, and reasonably foreseeable actions.

Impact Definitions

The following impact thresholds were established for analyzing impacts on cultural resources in the study area that may result from action alternatives and the duration at which point impacts would be either short or long term.

An adverse impact is one that results in a change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. The effect would be at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial, to the resources. The section 106 determination would be no adverse effect.

Minor. The effect is measurable or perceptible, but it is slight and affects a limited area of the landscape or few of its patterns or features. Slight alteration(s) to any of the characteristics that qualify the landscape for inclusion in the national register may diminish the integrity of the landscape. For purposes of section 106, the determination of effect would be adverse effect.

Moderate. The effect would alter a character-defining feature(s) of the cultural landscape. The integrity of the cultural landscape would be diminished but not completely lost. For purposes of section 106, the determination of effect would be adverse effect.

Major. The effect on the cultural landscape and its patterns and features is substantial, noticeable, and permanent. The action severely changes one or more characteristics that qualify the landscape for inclusion in the national register, diminishing the landscape's integrity to such an extent that it is no longer eligible for listing in the national register. For purposes of section 106, the determination of effect would be adverse effect.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated, and the waterline would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and no new access roads would be graded. Therefore, the no-action alternative would not result in impacts on cultural resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact cultural resources include implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP. The siting of the bypass project would result in short-term, negligible, adverse impacts on cultural resources. Because the bypass project would not displace or disrupt any cultural resources, long-term impacts on cultural resources would be negligible.

Construction of the deep water intake, related facilities, and access roads would have short-term, negligible, adverse impacts on cultural resources. The presence of permanent facilities and access roads associated with operation of the intake would not be expected to impact cultural resources. Implementation of activities associated with the Low Water Amendment to the Lake Mead NRA GMP would have similar short-term, negligible impacts and no long-term impacts. Repair and rehabilitation of the Historic Railroad Trail would have short-term, negligible, adverse impacts on cultural resources. Long-term impacts on cultural resources would not be expected.

Impacts associated with the no-action alternative, in combination with the short-term, localized, negligible, adverse and long-term, negligible, adverse impacts of other past, present, and reasonably foreseeable actions, would not be expected to impact cultural resources. The no-action alternative would not contribute to adverse cumulative impacts.

Conclusion. Implementation of the no-action alternative would not result in impacts on cultural resources nor would it contribute to cumulative impacts on cultural resources.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on cultural resources that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Impacts on cultural resources associated with the relocation and construction of the transmission line could result from the temporary disturbance of soil during site preparation for each monopole location and the clearing and use of conductor pulling sites to facilitate construction of the new transmission line. In order to mitigate potential impacts, archeological features identified during the pedestrian survey would be avoided. Cultural resource monitors would be used during construction. In the event a cultural resource is found, work would stop until consultation with the state historic preservation office could occur. Construction impacts on cultural resources are therefore expected to be short term and negligible.

Once constructed, each monopole would occupy an area approximately 4 feet to 6 feet in diameter, resulting in the permanent removal of approximately 0.014 acre. Because the permanent removal of this area represents such a small share of total land cover within Lake Mead NRA, long-term impacts would be negligible given the low likelihood that cultural resources would be disturbed.

Once in operation, periodic maintenance activities would be necessary. It is anticipated that personnel and vehicles would access these areas using the existing 20-foot-wide unpaved transmission line maintenance road and three smaller access roads that would be graded as part of the special use permit. As a result, impacts from the movement of vehicles would be limited to existing access roads and the immediate vicinity of the transmission line and monopole structures. Therefore, no impacts on cultural resources are anticipated from operation of the transmission line.

Access Roads Used During Construction and Periodic Maintenance. To the extent feasible, existing unpaved roads would be used to access construction areas. As necessary, new permanent dirt unpaved access roads would be constructed from the nearest access road to the base of each monopole, which would result in the disturbance of ground in areas occupied by new access roads. Similar to the relocation of the transmission line, archeological features identified during the pedestrian survey would be avoided and cultural resource monitors would be used during construction. In the event a cultural resource is found, work would stop until consultation with the state historic preservation office could occur. Short- and long-term impacts on cultural resources from the construction of access roads would therefore be negligible given the low likelihood that cultural resources would be disturbed.

Because maintenance and repair access to the transmission line right-of-way would be intermittent, infrequent, limited to responses to power outages, and would use existing permanent access roads, no impacts on cultural resources are anticipated from access roads during operation of the line.

Installation of a Waterline to Support Construction Activities. The waterline would be placed within the existing stream bed of the wash, and placement of the waterline would not involve excavation. The waterline would be fed through the culverts of the historic railroad grade, avoiding impacts on the resource. The eligibility of the historic railroad trail on the national register would therefore not be affected. Overall, the short-term impacts of waterline construction would be negligible. No long-term impacts would be expected.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact cultural resources would include the implementation of the bypass project, construction associated with the deep water intake at Lake Mead, stabilization and rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA GMP.

Cumulative impacts on cultural resources would be similar to those described for the no-action alternative above and would be negligible. Impacts associated with the action alternative would be negligible and represent a small share of the adverse cumulative impact.

Conclusion. Implementation of the action alternative would result in short- and long-term, negligible impacts on cultural resources given that archeological features identified during the pedestrian survey would be avoided and the low likelihood that cultural resources would be disturbed. Cultural resource monitors would be used during construction as necessary to ensure previously identified and/or eligible archeological sites are avoided. In the event a cultural resource is found, all work will cease and the state historic preservation office would be consulted to determine a course of action.

IMPACTS ON VISITOR USE AND EXPERIENCE

Methods and Assumptions

The methodology used for assessing impacts on visitor use and experience included using best professional judgment to identify areas where visitor use would be concentrated and the potential effects to visitor use and experience from the action alternative.

Study Area

The study area for visitor use and experience includes the area generally surrounding the project elements associated with the special use permit. It includes the Hacienda Casino and Hotel and adjacent helipad, Lake Mead Marina and Las Vegas Boat Harbor, a portion of the 3.7 mile Historic Railroad Trail, and designated backcountry areas within Lake Mead NRA on the south side of US Highway 93. The study area for cumulative impacts includes the aforementioned project study area and the project areas associated with past, present, and reasonably foreseeable actions.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on visitor use and experience that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in visitor use and experience.

An adverse impact is one that declines, degrades, and/or moves the resource away from a desired condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Visitors would not likely be aware of the effects associated with the alternative.

Minor. Changes in visitor use and/or experience would be detectable, although the changes would be slight. Effects associated with the alternative would be perceptible, but of little concern to visitors.

Moderate. Changes in visitor use and/or experience would be readily apparent and potentially long lasting. Visitors would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major. Changes in visitor use and/or experience would be readily apparent and have substantial and likely irreversible consequences. Visitors would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and no new access roads would be graded. Therefore, the no-action alternative would not result in impacts on visitor use and experience.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact visitor use and experience include implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP. The siting of the bypass project would result in short-term, moderate to major but localized, adverse impacts on visitor use and experience within Lake Mead NRA related to noise, dust, emissions, and the presence of construction vehicles, equipment and personnel as well as potential traffic delays and detours on existing highways and local roads. Because the bypass project would not displace or disrupt any locations or facilities that are heavily used by visitors, but may lead to a slight increase in vehicle-related noise, long-term impacts on visitor use and experience would be negligible and adverse. The extent and location of these impacts may vary should the alignment need to be refined if the special use permit is not issued.

Construction of the deep water intake, related facilities, and access roads would have short-term moderate but localized adverse impacts on visitor use and experience related to noise, dust, and the presence of construction vehicles, equipment, and personnel. The presence of permanent facilities and access roads associated with operation of the intake would not be expected to impact visitor use and experience. Repair and rehabilitation of the Historic Railroad Trail would have short-term, minor, adverse impacts on visitor use and experience resulting from temporary trail closure during repair work and placement of erosion control measures. Long-term impacts on visitor use and experience would be beneficial because stabilization and rehabilitation efforts would improve trail conditions in the future. Implementation of actions associated with the Low Water Amendment to the Lake Mead NRA GMP would have localized, short-term, minor, adverse impacts on visitor use and experience related to noise, dust, and the presence of construction vehicles, equipment, and personnel during alterations to existing marina and boat launch facilities. Long-term, minor to moderate, adverse impacts would result if low water conditions led to the closure of certain facilities and concentration of visitor access at remaining facilities.

Impacts associated with the no-action alternative, in combination with the short-term, localized, moderate to major, adverse; long-term, negligible to moderate, adverse; and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major, adverse and long-term, negligible to minor, adverse cumulative impacts on visitor use and experience. The majority of adverse cumulative impacts would result from construction of the bypass project. The no-action alternative would not contribute to adverse cumulative impacts.

Conclusion. The no-action alternative would not result in impacts on visitor use and experience. Impacts associated with the no-action alternative, in combination with the short-term, localized, moderate to major, adverse; long-term, negligible to moderate, adverse; and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major, adverse and long-term, negligible to minor, adverse cumulative impacts on visitor use and experience. The majority of adverse cumulative impacts would result from construction of the bypass project. The no-action alternative would not contribute to adverse cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under the action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on visitor use and experience that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Relocation of the transmission line and decommissioning of the existing transmission line would generate noise, dust, and emissions from construction vehicles and equipment in the study area. Vehicles transporting construction equipment, materials, and personnel could temporarily cause increased traffic on local roads. Construction of transmission line monopoles would also require the use of a helicopter in areas that are too steep to access with conventional construction vehicles and equipment, and blasting may be used to prepare transmission line structure sites in some rocky locations. Helicopter use and blasting during construction of the transmission line would be perceptible to visitors, but would be short in duration. These activities would occur in designated backcountry areas that are not heavily used by visitors. Additionally, these areas would be closed for visitor access when construction activities are ongoing. Therefore, short-term, localized, minor, and adverse impacts on visitor use and experience would result.

Once in operation, visitors would be able to access this area as they did under existing conditions, resulting in no impact on visitor use and experience. However, periodic maintenance activities, including the use of helicopters to inspect the line would result in negligible to minor, adverse impacts in localized areas when such activities are ongoing.

Access Roads Used During Construction and Periodic Maintenance. Access road grading and use would have impacts on visitor use and experience similar to those described for construction of the transmission line above, resulting from noise, dust, emissions, and traffic associated with construction vehicles and equipment. Access roads associated with construction and maintenance of the transmission line would not be located near areas of concentrated visitor use. Therefore, short-term impacts on visitor use and experience would be negligible to minor, localized, and adverse.

The use of access roads throughout the life cycle of the transmission line to conduct periodic maintenance activities would be infrequent. Therefore, impacts would be long-term, negligible to none and would be associated with use of the access roads during operation of the transmission line.

Installation of a Temporary Waterline to Support Construction Activities. Impacts on visitor use and experience from construction of the waterline would result from heavy material haul trucks, construction equipment, and personnel used to place the waterline and pumps. The approximately 2-mile waterline alignment would be near the Las Vegas Boat Harbor, Lake Mead Marina, and Hacienda Hotel and Casino, and would run through an existing culvert underneath the Historic Railroad Trail. Construction personnel, vehicles, and equipment would be evident to visitors at these locations, but would not be expected to impede or detract from visitor use and experience. Given the

anticipated two-month duration of construction, impacts are expected to be short-term, minor, and adverse.

The operation of the waterline would include a barge-mounted intake and pump located near the Las Vegas Boat Harbor and Lake Mead Marina. The pump would create noise that would be perceptible to marina users; however, the barge would be sited at a sufficient distance from the marina to minimize noise impacts. Vehicle use and personnel related to operation and maintenance of the waterline are expected to be limited. Operation of the pumps would likely occur 24 hours per day throughout the duration of construction for the bypass. These impacts are anticipated to be short-term, minor, and adverse.

Once construction of the bypass project is complete, the waterline would be removed. Therefore, no long-term impacts on visitor use and experience would result from the waterline.

Cumulative Impacts. Past, present, and reasonably foreseeable actions that could impact visitor use and experience include the implementation of the bypass project, construction associated with the deep water intake, stabilization and rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA GMP. The siting of the bypass project would result in short-term moderate to major but localized adverse impacts on visitor use and experience within Lake Mead NRA that would be related to noise, dust, emissions, and the presence of construction vehicles, equipment, and personnel as well as potential traffic delays and detours on existing highways and local roads. Because the bypass project would not displace or disrupt any locations or facilities that are heavily used by visitors but may lead to a slight increase in traffic noise, long-term impacts on visitor use and experience would be negligible and adverse.

Construction of the deep water intake, related facilities, and access roads and the repair and rehabilitation of the Historic Railroad Trail would have impacts similar to those discussed for the no-action alternative above.

Impacts associated with the action alternative, in combination with the short-term, localized, moderate to major, adverse; long-term, negligible, adverse; and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major, adverse and long-term, negligible, adverse cumulative impacts on visitor use and experience. The majority of adverse cumulative impacts would result from construction of the bypass project. Impacts associated with the action alternative would represent a small portion of the adverse cumulative impacts.

Conclusion. The action alternative would result in short-term, negligible to minor impacts on visitor use and experience. Minor to no long-term impacts would result from the action alternative. Impacts associated with the action alternative, in combination with the short-term, localized, moderate to major adverse; long-term negligible, adverse; and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, moderate to major, adverse and long-term, negligible, adverse cumulative impacts on visitor use and experience. The majority of

adverse cumulative impacts would result from construction of the bypass project. Impacts associated with alternative 1 would represent a small portion of the adverse cumulative impacts.

IMPACTS ON PUBLIC HEALTH AND SAFETY

Methods and Assumptions

Impacts on public health and safety were determined by considering the continuation of current management policies and comparing them to project alternatives. Impacts on public health and safety were analyzed qualitatively using best professional judgment of subject-matter experts.

Study Area

The study area for public health and safety includes those areas within a 0.25 mile of the existing and relocated transmission line rights-of-way, existing and new access roads, and the waterline right-of-way. The same study area is applied for the cumulative impacts analysis.

Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on public health and safety that may result from project alternatives and the duration at which point impacts would be either short or long term. Beneficial impacts are not quantified beyond resulting in a positive change in public health and safety.

An adverse impact is one that declines, degrades, and/or moves the resource away from a desired condition. Adverse impacts are further qualified in this analysis according to their intensity and defined in the following four categories.

Negligible. Impacts would not have a noticeable effect on public health and safety, with no injuries or loss of life.

Minor. Impacts would be detectable, but would not have an appreciable effect on public health and safety, with potential for few minor injuries and no loss of life.

Moderate. Impacts would have readily detectable impacts and would result in substantial, noticeable effects on public health and safety on a local scale, with possible injuries, but no loss of life.

Major. Impacts would have readily detectable impacts and would result in substantial, noticeable effects on public health and safety on a local or regional scale, or with the possibility of serious injuries and/or loss of life.

Duration. Short-term impacts of the transmission line would be six months, the expected duration of construction. The regular use of newly graded access roads would have the same duration. Long-term impacts of the transmission line and newly graded access roads would result once the

transmission line is in operation. Impacts during construction (two months) and operation (three years) of the waterline are considered short term. Long-term impacts would be those after construction of the bypass project is complete, an estimated three years. Short- and long-term impacts of the unpaved transmission line maintenance road would be the same as for the waterline.

Impacts of the No-Action Alternative

Analysis. Under the no-action alternative, the National Park Service would not issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. As a result, the transmission line would not be relocated and the waterline would not be constructed. There would be no increase in use of the existing access roads related to construction vehicles and equipment, and no new access roads would be graded. Therefore the no-action alternative would not result in impacts on public health and safety.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact public health and safety include implementation of the bypass project, construction associated with the deep water intake, implementation of actions associated with the Low Water Amendment to the Lake Mead NRA, and stabilization and rehabilitation of the Historic Railroad Trail. The siting of the bypass project could result in short-term adverse impacts on public health and safety resulting from worker injury and spills of fuel and other fluids associated with mechanical equipment used during construction. The extent of adverse impacts would depend on the type of incident. Areas where construction activities are ongoing would be closed to the general public. As a result, short-term impacts on public health and safety are anticipated to be negligible to minor. No long-term impacts on public health and safety are anticipated.

Similar short-term impacts may result from construction of the deep water intake, related facilities, and access roads, repair and rehabilitation of the Historic Railroad Trail, and actions associated with the Low Water Amendment. The presence of permanent infrastructure associated with the deep water intake and alterations to existing permanent infrastructure associated with the Low Water Amendment is not anticipated to impact public health and safety. Repair and rehabilitation of the Historic Railroad Trail would benefit public health and safety because stabilization and rehabilitation efforts would improve trail conditions and user safety.

As indicated in the discussion of soils in Chapter 3 above, geotechnical borings with an asbestos content measured at above 1% have been collected within the project area. This material is classified as asbestos containing material. Amphibole asbestos minerals are known human carcinogens and exposure is linked to mesothelioma and other health disorders. Studies have found that workers can be directly exposed through outdoor dust emissions. Asbestos fibers can become airborne as a result of soil disturbance during construction activities, creating a pathway to humans through the air. These fibers are not visible to the naked eye. Fibrous amphiboles can also attach to car tires or clothing thus increasing the risk of exposure for other populations besides those directly exposed through outdoor dust emissions (Buck et al. 2013). All actions involving ground-disturbing activity have the potential to mobilize dust containing asbestos particles, which could result in major impacts

on public health and safety. With mitigation measures such as those detailed below and summarized in table 2, it is anticipated that asbestos-related impacts would be minimized.

For all actions summarized above, it is anticipated that a construction action plan detailing worker protocols would be prepared prior to the onset of construction activities. The plan would be prepared in accordance with all applicable Occupational Safety and Health Administration (OSHA) regulations and identify best management practices (BMPs) to be implemented to manage construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills. If a release should occur, BMPs would be in place to ensure such releases are contained and cleaned up promptly in accordance with all applicable regulations. The project would also be required to follow worker safety provisions in 1926.1101, the OSHA respiratory standard (CFR 1910.134), and other standards would apply during disturbance of geologic materials, because asbestos may be present in soils in the project area (Kleinfelder 2014).

Impacts associated with the no-action alternative, in combination with the short-term, negligible to moderate, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, could result in short-term, minor to moderate cumulative impacts on public health and safety. It is anticipated that with the implementation of worker safety measures, adverse impacts would be minimized or avoided. The no-action alternative would not contribute to adverse cumulative impacts.

Conclusion. The no-action alternative would not result in impacts on public health and safety. Impacts associated with the no-action alternative, in combination with the short-term, negligible to minor, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, negligible to minor, adverse cumulative impacts on public health and safety. The no-action alternative would not contribute to adverse cumulative impacts.

Impacts of the Action Alternative: Issuance of Special Use Permit (Preferred Alternative)

Analysis. Under The action alternative, the National Park Service would issue a special use permit to the Regional Transportation Commission of Southern Nevada to allow the three elements of the action alternative. Impacts on public health and safety that would result from the three elements of the action alternative are described below.

Transmission Line Relocation. Relocation of the transmission line and decommissioning of the existing transmission line could have impacts on public health and safety related to worker injury and spills of fuel and other fluids associated with mechanical equipment used during construction. Worker safety training and protocols would be in place to minimize injury, and a construction action plan and BMPs would be implemented to manage construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills. If a release should occur, BMPs would be in place to ensure such releases are contained and removed in accordance with all applicable regulations. The extent of adverse impacts would depend

on the type of incident. As discussed under the no-action alternative, naturally occurring asbestos has been confirmed within the project area. As a result, mitigation measures would be necessary to minimize potentially major health and safety impacts. All worker safety provisions in 1926.1101, the OSHA respiratory standard (CFR 1910.134), and other standards would apply during disturbance of geologic materials (Kleinfelder 2014). Additional mitigation measures are summarized in table 2 above. Areas where construction activities are ongoing would be closed to the general public. As a result, short-term impacts on public health and safety are anticipated to be negligible to minor.

Over the long term, impacts on public health and safety from operation of the transmission line are not anticipated. Safety protocols that would be implemented during construction would also be followed during maintenance activities. Therefore, impacts on public health and safety are anticipated to be negligible.

Access Roads Used During Construction and Periodic Maintenance. Access road construction and use would have impacts on public health and safety similar to those described for relocation of the transmission line above, resulting from worker injury and spills of fuel and other fluids associated with mechanical equipment used during construction as well as potential mobilization of dust containing asbestos particles. As a result, asbestos mitigation measures would be adopted and the same or a similar construction action plan and BMPs would be implemented to manage construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills. If a release should occur, BMPs would be in place to ensure such releases are contained and removed in accordance with all applicable regulations. The extent of adverse impacts would depend on the type of incident. Areas where construction activities are ongoing would be closed to the general public. As a result, short-term impacts on public health and safety are anticipated to be negligible to minor.

The use of access roads throughout the life cycle of the transmission line to conduct periodic maintenance activities would be infrequent. As a result, long-term impacts to public health and safety from the use of access roads during the operation of the transmission line would be negligible to none l.

Installation of a Temporary Waterline to Support Construction Activities. Installation and operation of the waterline could have impacts on public health and safety similar to those described for the relocation of the transmission line and grading of access roads above. Impacts may result from worker injury and spills of fuel and other fluids associated with mechanical equipment used during construction. As a result, the same or a similar construction action plan and BMPs would be implemented to manage construction-related hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids, and to avoid releases and spills. If a release should occur, BMPs would be in place to ensure such releases are contained and cleaned up promptly in accordance with all applicable regulations. The extent of adverse impacts would depend on the type of incident. Areas where construction activities are ongoing would be closed to the general public. As a result, short-term impacts on public health and safety are anticipated to be negligible to minor.

Because the waterline would be removed once construction of the bypass project is complete, no long-term impacts on public health and safety would result.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that could impact public health and safety include implementation of the bypass project, construction associated with the deep water intake, and stabilization, rehabilitation of the Historic Railroad Trail, and the Low Water Amendment to the Lake Mead NRA GMP. Cumulative impacts associated with these actions would be the same as those described for the no-action alternative.

Impacts associated with the action alternative, in combination with the negligible to minor, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, negligible to minor, adverse cumulative impacts on public health and safety. The extent of adverse impacts would depend on the type and number of incidents that occur. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

Conclusion. The action alternative could result in short-term negligible to minor adverse impacts on public health and safety that would be minimized by asbestos mitigation, worker safety training, implementation of a construction action plan, and BMPs for spills of fuels and other hazardous materials related to construction activities. Impacts associated with the action alternative, in combination with the short-term, negligible to minor, adverse and long-term, beneficial impacts of other past, present, and reasonably foreseeable actions, would result in short-term, negligible to minor, adverse cumulative impacts on public health and safety. The extent of adverse impacts would depend on the type and number of incidents that occur. Impacts associated with the action alternative would represent a small share of the adverse cumulative impact.

CHAPTER 5: CONSULTATION AND COORDINATION

One of the primary objectives of the National Environmental Policy Act of 1969 is to encourage participation in the planning process by appropriate federal and state agencies and interested members of the public. This chapter describes consultation that occurred during development of this environmental assessment. It also includes a description of public involvement processes employed to engage the aforementioned parties as well as a list of the recipients of the EA document.

THE SCOPING PROCESS

The National Park Service divides the scoping process into two parts: internal and external (or public) scoping. Internal scoping involves discussions among NPS staff regarding the purpose of and need for management actions, issues and objectives, management alternatives, mitigation measures, the appropriate level of documentation, and available references and guidance, among other topics.

External (or public) scoping is the early involvement of the interested and affected public in the planning effort. This ensures that members of the public have an opportunity to comment and contribute early in the decision-making process. For this planning document, project information was distributed to individuals, agencies, and organizations in the earliest stages of the decision-making process. Interested parties and individuals were given the opportunity to express concerns or views regarding the project, including identifying important issues and proposing other project alternatives or components. These processes, internal and external (or public) scoping, are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this environmental assessment.

INTERNAL SCOPING

The National Park Service initiated internal scoping specific to the proposed transmission line and waterline on December 17, 2013. This led to the development of the Environmental Screening Form. A site visit was conducted by the National Park Service and Louis Berger staff on March 6, 2014. Additionally, the National Park Service was a cooperating agency for the 2005 EIS for the Boulder City Bypass and already approved the use of NPS land at Lake Mead NRA for construction of the bypass. Since the National Park Service has already approved the use of this land, issues that may have been identified by the agency have largely been addressed.

PUBLIC SCOPING

A number of media sources were used to inform the public, interest groups, and local public entities that an environmental assessment would be prepared regarding the proposed special use permit and provide opportunities for them to become involved in the planning process. On April 30, 2014, NPS staff initiated public scoping for the environmental assessment by issuing a press release and public scoping letter that provided a brief summary of the EA process, project background, purpose of and need for action, and objectives and issues to be addressed through the planning process. The letter also provided information about ways to provide comment regarding the project. The letter was posted to the Lake Mead NRA website at

http://parkplanning.nps.gov/projectHome.cfm?projectID=50281, and an announcement was sent to numerous media outlets throughout the Boulder City and Las Vegas areas. The letter was also posted at the Alan Bible Visitors Center, located adjacent to the project area.

The release of the public scoping letter initiated the minimum 30-day public scoping period in accordance with the National Environmental Policy Act of 1969 and Director's Order 12. The scoping period began on April 30, 2014, and concluded on May 31, 2014. A summary of comments received during the public scoping period is presented below.

PUBLIC SCOPING COMMENTS

During the public scoping period, a total of one piece of correspondence was received, which was outside of the scope of the project but generally referred to water resource issues.

AGENCY CONSULTATION

In accordance with section 5.5 of Director's Order 12, coordination with federal and state agencies was initiated early in the decision-making process. As required by NPS policies and planning documents, it is the objective of Lake Mead NRA to work with state, federal, and local governments and private organizations to ensure the Lake Mead NRA and its programs are coordinated with those government and private entities' programs, are supportive of their objectives, and that state, federal, and local government and private organizations' programs are similarly supportive of NPS programs.

There have been numerous meetings with federal, state, and local agencies since the preparation of this environmental assessment began. The Nevada State Historic Preservation Office was informed of the proposed action through consultation that began in early 2014. During that meeting, NPS staff presented their intention to engage in a planning process that weighed the need to protect resource values, protect visitor use and experience, and ensure visitor safety. Actions described in the environmental assessment are subject to section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC, section 470 et seq.). Consultation with Nevada state historic preservation office staff will be ongoing during review of the environmental assessment, and the National Park Service will fulfill its obligations under section 106.

The following federal departments and state and local agencies were consulted during the preparation of this environmental assessment.

- Federal Highway Administration
- US Fish and Wildlife Service
- Nevada Department of Transportation
- Nevada Division of Wildlife
- Nevada Natural Heritage Program

- Nevada State Historic Preservation Office
- Regional Transportation Commission of Southern Nevada

RECIPIENTS OF THE ENVIRONMENTAL ASSESSMENT

To inform the public of the availability of the environmental assessment, NPS staff will distribute a notification letter to local businesses and land owners; federal, state, and county agencies; representatives of educational institutions; nongovernmental organizations; and members of the public on the project mailing and e-mail lists. Lake Mead NRA's mailing list comprises 244 federal, state, and local agencies; individuals; businesses; and organizations. The environmental assessment is distributed to those individuals, agencies, and organizations likely to have an interest in this project. Entities on the Lake Mead NRA mailing list that do not receive a copy of the environmental assessment receive a letter notifying them of its availability and methods of accessing the document.

Similar to the initial scoping process, the National Park Service will issue a press release announcing the availability of the environmental assessment. The document will also be available electronically on the Lake Mead NRA Planning, Environment and Public Comment website. Copies of the environmental assessment will be available at area libraries, including: Boulder City Library, Clark County Community College (North Las Vegas), Clark County Library, Las Vegas Public Library, Green Valley Library (Henderson), James I. Gibson Library (Henderson), Sahara West Library (Las Vegas), Mohave County Library (Kingman, AZ), Sunrise Public Library (Las Vegas), University of Arizona Library (Tucson, AZ), University of Nevada Las Vegas James R. Dickinson Library, Meadview Community Library, Moapa Valley Library (Overton, NV), Mesquite Library, Mohave County Library (Lake Havasu City, AZ), Laughlin Library, Searchlight Library, and Washington County Library (St. George, UT). Copies of the document will also be provided upon request.

APPENDIXES AND INDEX

APPENDIX A: REFERENCES

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APPENDIX B: PREPARERS AND CONSULTANTS

NATIONAL PARK SERVICE

Lake Mead National Recreation Area

Mike Boyles	Project Manager
Bruce Nyhuis	Chief of Maintenance

THE LOUIS BERGER GROUP, INC.

Roger Patton	Principal-in-Charge
Lori Fox	Quality Assurance/Quality Control
Mike Mayer	Quality Assurance/Quality Control
Robert Knable	Project Manager
Dara Braitman	Project Manager (former)
Kelley Hestmark	Environmental Planning Intern (former)
Brandon Marette	Biologist
Jason Medema	Environmental Planner
Korey Smith	Graphics
Denise Short	Senior Editor
Leo Tidd	Senior Planner
Randy Winslow	Graphics

APPENDIX C: ACRONYMS AND ABBREVIATIONS

BMP	best management practice
bypass project	Interstate 11 Boulder City Bypass
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CRC	Colorado River Commission
dBA	A-weighted scale
EA	environmental assessment
EIS	environmental impact statement
ESA	Endangered Species Act
FHWA	Federal Highway Administration
GMP	General Management Plan
I-11	Interstate 11
$\mu g/m^3$	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
national register	National Register of Historic Places
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act of 1969, as amended
NNHP	Nevada Natural Heritage Program
NPS	National Park Service
NRA	National Recreation Area
OSHA	Occupational Safety and Health Administration
$PM_{2.5}$	Particulates that are smaller than or equal to 2.5 microns in size
PM_{10}	Particulates that are smaller than or equal to 10 microns in size

Ppm	parts per million
RTC	Regional Transportation Commission of Southern Nevada
SO_2	sulphur dioxide
SR	State Route
USC	United States Code
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGCR	US Government Construction Railroad
US Highway 93	United States Highway 93

APPENDIX D: PLANT SPECIES OBSERVED IN THE BYPASS STUDY AREA, MAY 2014

Common Name	Scientific Name	Common Name	Scientific Name
catclaw acacia	*Acacia greggii*	broom snakeweed	*Gutierrezia sarothrae*
burrobush	*Ambrosia dumosa*	big galleta grass	*Hilaria rigida*
bristly fiddleneck	*Amsinckia tessellata*	burrobrush	*Hymenoclea salsola*
threeawn grass	*Aristida sp.*	littleleaf ratany	*Krameria erecta*
desertholly	*Atriplex hymenelytra*	creosote bush	*Larrea tridentata*
sweetbush	*Bebbia juncea*	common fishhook cactus	*Mammillaria tetrancistra*
California brickellbush	*Brickellia californica*	Parry's false prairie-clover	*Marina parryi*
sandmat	*Chamaesyce sp.*	whitestem blazingstar	*Mentzelia albicaulis*
Mojave spineflower	*Chorizanthe spinosa*	tree tobacco	*Nicotiana glauca*
Cryptantha	*Cryptantha sp.*	desert tobacco	*Nicotiana obtusifolia*
silver cholla	*Cylindropuntia echinocarpa*	birdcage evening primrose	*Oenothera deltoides*
Branched pencil cholla	*Cylindropuntia ramosissima*	beavertail pricklypear cactus	*Opuntia basilaris*
cottontop cactus	*Echinocactus polycephalus*	Schott's pygmycedar	*Peucephyllum schottii*
Johnson's fishhook cactus	*Echinomastus johnsonii*	desert Indianwheat	*Plantago ovata*
brittlebush	*Encelia farinosa*	bush arrowleaf	*Pleurocoronis pluriseta*
Virgin River brittlebush	*Encelia virginensis var. virginensis*	Fremont's dalea	*Psorothamnus fremontii*
Mormon tea	*Ephedra viridis*	Mexican bladdersage	*Salazaria mexicana*
flatcrown buckwheat	*Eriogonum deflexum*	desert globemallow	*Sphaeralcea ambigua*
Eastern Mojave buckwheat	*Eriogonum fasciculatum*	brownplume wirelettuce	*Stephanomeria pauciflora*
desert trumpet	*Eriogonum inflatum*	salt cedar	*Tamarix ramosissima*
desert stingbush	*Eucnide urens*	Arizona honeysweet	*Tidestromia oblongifolia*
barrel cactus (California or Leconte's?)	*Ferocactus acanthodes*	broadleaf cattail	*Typha latifolia*

Source: NewFields 2014

APPENDIX E: ENDANGERED SPECIES ACT SPECIES LIST (USFWS 2014)

U.S. Fish & Wildlife Service

IPaC - Information, Planning, and Conservation System

Environmental Conservation Online System

Search

IPaC Home Page | Initial Project Scoping | Project Builder | FAQs

Step 1
Location

Step 2
Activities

Step 3
Trust resources list

Step 4
Conservation measures

Natural Resources of Concern

Back | Continue...

Save or Print the Preliminary Species list

Request an Official Species list

An online Endangered Species Act species list IS available on this page for part of your project area, represented by the office(s) listed below.

The Endangered Species Act species list below is for planning purposes only -- it is not an official species list. To request an official species list, click the **Request an Official Species list** link to the right and follow the instructions.

Nevada Fish and Wildlife Office
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NV 89502
(775) 861-6300
http://www.fws.gov/nevada/

An online Endangered Species Act species list IS NOT available for the remainder of your project area, represented by the office(s) listed below.

To request a preliminary or official species list for this portion of your project, follow the web link of the office(s) below. If a web link is not shown for an office, please contact them by mail or phone.

Arizona Ecological Services Field Office
2321 WEST ROYAL PALM ROAD, SUITE 103
PHOENIX, AZ 85021
(602) 242-0210
http://www.fws.gov/southwest/es/arizona/

Project Location Map:

Note: The map reflects the map layers selected on the Step 1 Location page. To change what appears on this map, return to the Location page and adjust the map layers.

Project Counties:
Mohave, AZ | Clark, NV

Project type: Transportation

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **6** threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Amphibians	Status		Has Critical Habitat	Contact
relict leopard Frog (*Lithobates onca*)	Candidate	species info		Nevada Fish And Wildlife Office
Birds				
Southwestern Willow flycatcher (*Empidonax traillii extimus*) Population: Entire	Endangered	species info	Final designated critical habitat	Nevada Fish And Wildlife Office
Yuma Clapper rail (*Rallus longirostris yumanensis*) Population: U.S.A. only	Endangered	species info		Nevada Fish And Wildlife Office
Fishes				
Bonytail chub (*Gila elegans*) Population: Entire	Endangered	species info	Final designated critical habitat	Nevada Fish And Wildlife Office
Razorback sucker (*Xyrauchen*	Endangered	species info	Final designated critical habitat	Nevada Fish And Wildlife Office

texanus) Population: Entire				
Reptiles				
Desert tortoise (*Gopherus agassizii*) Population: U.S.A., except in Sonoran Desert	Threatened	species info	Final designated critical habitat	Nevada Fish And Wildlife Office

Don't see a species you expect to see?

Critical habitats within your project area: (View all critical habitats within your project area on one map)

The following critical habitats lie fully or partially within your project area.

Fishes	Critical Habitat Type
Bonytail chub (*Gila elegans*) Population: Entire	Final designated critical habitat
Razorback sucker (*Xyrauchen texanus*) Population: Entire	Final designated critical habitat

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no National Wildlife Refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.

Back Continue...

Last updated: March 6, 2014

APPENDIX F: USFWS SPECIES CONSIDERED

Species	Federal Status	Critical Habitat	Likely to Occur in this Study Area? Rationale
		Amphibians	
Relict leopard frog (*Lithobates onca*)	Candidate	None designated	No. This species' habitat is limited to permanent streams, springs, and spring-fed wetlands (USFWS 2014b). No relict leopard frog habitat is found within the proposed study area.
		Birds	
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Endangered	No designated Critical Habitat is located in the study area.	No. This species' habitat is limited to dense riparian areas with microclimatic conditions including standing water, saturated soils, or nearby streams/pools (USFWS 2014c). No Southwestern Willow Flycatcher habitat occurs within the study area.
Yuma Clapper Rail (*Rallus longirostris yumanensis*)	Endangered	None designated	No. This species habitat is limited to cattail or cattail-bulrush marshes (USFWS 2014d). No Yuma Clapper Rail habitat occurs within the study area.
		Fishes	
Bonytail chub (*Gila elegans*)	Endangered	No designated Critical Habitat in study area. However, Critical Habitat is located immediately downstream of Hoover Dam (USFWS 2014e).	No. This species' limited distribution is restricted to the flowing portions of the upper and lower Colorado River (USFWS 2014f).
Razorback sucker (*Xyrauchen texanus*)	Endangered	Critical Habitat is located within this study area.	Yes. This species currently inhabits Lake Mead (USFWS 2014g), and the waterline will be drawing water from the lake; therefore, this species may be affected by this project. This species is further discussed above.
		Reptiles	
Desert tortoise (*Gopherus agassizii*)	Threatened	No designated Critical Habitat within study area.	Yes. The proposed project is within desert tortoise habitat so this species may be affected; therefore, this species may be affected by this project. This species is further discussed above.

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APPENDIX G: OTHER STATE-LISTED SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE ACTION AREA

Species	State Status	Likely to Occur in this Study Area? Rationale
Mammals		
Allen's big-eared bat (*Idionycteris phyllotis*)	S1	Yes. This species' preferred habitat is mountainous wooded areas and near cliffs and water sources (NatureServe 2013). Summer roosts could occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Big brown bat (*Eptesicus fuscus*)	S4	Yes. This species prefers various wooded and semi-open habitats, with summer roosts in rock crevices and tunnels (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Big free-tailed bat (*Nyctinomops macrotis*)	S1S2M	Yes. This species prefers rocky areas in rugged country and roosts in rock crevices (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Brazllian (Mexican) free-tailed bat (*Tadarida brasiliensis*)	None	Yes. This species prefers roosting in caves (NatureServe 2013), as they are known to roost in the adjacent historic trail tunnels in the summer (Boyles 2014). However, the waterline is not going through the tunnels, so adjacent disturbances should be minor to negligible. Also trail restoration is planned for winter months, to avoid disturbing this species (Boyles 2014). Roosts could also occur near where the transmission line is being relocated.

Species	State Status	Likely to Occur in this Study Area? Rationale
California leaf-nosed bat (*Macrotus californicus*)	S2	Yes. This species prefers lowland desert scrub and cave habitats (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
California myotis (*Myotis californicus*)	S4	Yes. This species prefers western lowlands, desert scrub, and caves for hibernation (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Desert bighorn sheep (*Ovis canadensis nelson*)	S4	Yes. They were observed east of the Hacienda Hotel during a March 6, 2014 site visit. This proposed project may affect this species; therefore, this species is further discussed above.
Fringed myotis (*Myotis thysanodes*)	S2	Yes. This species uses middle elevation deserts and woodland habitats, roosting in caves (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Long-eared myotis (*Myotis evotis*)	S4	Yes. Roosts in mostly forested areas, especially those with broken rock outcrops (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.

Species	State Status	Likely to Occur in this Study Area? Rationale
Mexican long-tongued bat (*Choeronycteris mexicana*)	SNA	Yes. This species prefers deep mountain canyons with dense riparian vegetation, and roosts in caves (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Pallid bat (*Antrozous pallidus*)	S3	Yes. This species prefers arid deserts and grasslands, often near rocky outcrops and water (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Spotted bat (*Euderma maculatum*)	S2	Yes. Found in various habitats from desert to montane coniferous stands, and roosts in cliffs and canyons (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Townsend's big-eared bat (*Corynorhinus townsendii*)	S2	Yes. This species prefers caves, buildings, and tree cavities (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Western pipistrelle/Canyon Bat (*Parastrellus hesperus*)	S4	Yes. This species prefers deserts, lowlands and rocky canyons (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.

Species	State Status	Likely to Occur in this Study Area? Rationale
Yuma myotis (*Myotis yumanensis*)	S3S4	Yes. This species prefers desert scrub areas near water (NatureServe 2013). Roosts could also occur near where the transmission line is being relocated, and in the historical railroad trail tunnels–which is adjacent to where the waterline is being installed.
Reptiles		
Common chuckwalla (*Sauromalus ater*)	S2	Yes, this species could occur in area of transmission line relocation; therefore, this species is further discussed above.
Gila monster (*Heloderma suspectum cinctum*)	S3	Yes, observed during previous surveys (NewFields 2014). Therefore, this species is further discussed above.

S=(Sensitive Species): S1=Critically Imperiled, S2=Imperiled, S3=Vulnerable, S4=Apparently Secure, NA=Not Applicable

REFERENCES

NatureServe

2013 NatureServe explorer, Version 7.1 (February 2, 2009). Last updated July 2013. Accessed June 12, 2014. http://explorer.natureserve.org/servlet/NatureServe.

NewFields

2014 Biological Assessment for Phase 2 of the I-11 Boulder City Bypass Project. Las Vegas, NV.

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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