



National Park Service
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Navajo Generating Station
Page, Arizona

A Water Intake Project for the Navajo Generating Station Environmental Assessment/Assessment of Effect

June 2007



NGS Water Intake Project

Environmental Assessment/Assessment of Effect

Summary

The Navajo Generating Station (NGS) is a 2,250 megawatt coal-fired, steam-electric power plant located approximately 3 miles northeast of Page, Coconino County, Arizona. The plant was constructed in the early 1970s to provide electrical energy for the Central Arizona Project, a series of canals, pumping plants, dams, and holding reservoirs that deliver Colorado River water from Lake Havasu to Central Arizona, including metropolitan Phoenix and Tucson. NGS, which is operated by the Salt River Project (SRP), also serves electric customers in Arizona, Nevada, and California. Other participating owners of NGS include the U.S. Bureau of Reclamation (Reclamation), the Los Angeles Department of Water and Power, Arizona Public Service, Nevada Power, and Tucson Electric Power.

NGS was constructed near Lake Powell to ensure it had a dependable supply of cooling water for its three generators. The water intakes for NGS were constructed on a cliff overlooking the lake. When NGS was constructed, it received an annual allotment of 34,100 acre-feet of water, and the intakes that pump water from the lake to the plant were installed at a maximum elevation¹ of 3,470 feet, or 230 feet below the lake's full pool level of 3,700 feet.

Since the start of a persistent drought, inflows to Lake Powell have been below average, leading to a drawdown of the lake that continues to the present. Over the past seven years, from 2000 through 2006, inflow to Lake Powell has been below average in all but 1 year (2005), and it is likely that inflow will again be below average in 2007 (Reclamation 2007). As a result, the lake has dropped from nearly full in 1999 to approximately 40 percent of capacity in mid-March 2007, with the lake elevation at 3,598 feet, only about 100 feet higher than the minimum level necessary for the NGS water intake pumps to remain operational. Current projections using Reclamation methods indicate the lake surface elevation could fall below 3,498 feet, the minimum level necessary for the NGS water intake pumps to remain operational, by April 2010. If severe drought conditions persist, these reduced lake levels could be reached as early as April 2009.

Without water used as steam in power generation and for cooling the power plant, NGS cannot remain operational. NGS currently provides power to several million customers throughout the Southwest and provides power to pump water to many of the same people in central and southern Arizona. If Lake Powell drops below 3,498 feet, NGS could no longer withdraw water. Thus, drought conditions and declining lake water levels could force the closure of NGS (2,250 megawatts), a facility that helps ensure the reliability of the Central Arizona Project and the electrical supply grid of the southwestern United States. As a result, SRP and the other operators of NGS propose to modify the water intake system of NGS by installing new intake structures at an elevation below that of the current intakes to ensure that cooling water will be available for the continued operation of NGS.

This Environmental Assessment/Assessment of Effect has been prepared, pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA), to provide the decision-making framework that (1) analyzes a reasonable range of alternatives to meet the project objectives, (2) addresses the potential impacts associated with the construction and operation of new NGS water intakes, and (3) identifies mitigation measures to lessen the degree or extent of these impacts. Because construction of the new intake structures has required SRP to obtain a new easement within the boundary of the Glen Canyon National Recreation Area, the National Park Service (NPS) is the lead federal agency responsible for assuring NEPA compliance. Reclamation has worked cooperatively with NPS and SRP in developing this Environmental Assessment/Assessment of Effect, which assesses the potential social, economic, and

¹ Elevations in this document are referenced to mean sea level.

environmental impacts associated with two Action Alternatives (construction of the new water intakes) and a No Action Alternative. In addition, this document summarizes the alternatives development process, explains the rationale for eliminating specific alternatives, and summarizes the public participation process.

Public Comment

If you wish to comment on this Environmental Assessment/Assessment of Effect, comments may be posted online at <http://parkplanning.nps.gov/> or mailed to the name and address provided below. This document will be available for public review for 30 days. Before including your name, address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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PURPOSE AND NEED

Introduction

This Environmental Assessment/Assessment of Effect has been prepared to address the potential impacts associated with the construction and operation of new Navajo Generating Station (NGS) water intakes. Because construction of the new intake structures has required Salt River Project (SRP) to obtain a new easement within the boundary of the Glen Canyon National Recreation Area (GCNRA), the National Park Service (NPS) is the lead federal agency. The U.S. Bureau of Reclamation (Reclamation) has worked cooperatively with NPS and SRP in developing the Environmental Assessment/Assessment of Effect, which assesses the potential social, economic, and environmental impacts associated with two Action Alternatives for construction of the new water intakes and a No Action Alternative. In addition, this document summarizes the alternatives development process, explains the rationale for eliminating specific alternatives, and summarizes the public participation process. This Environmental Assessment/Assessment of Effect has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (40 Code of Federal Regulations [CFR] 1508.9), and the NPS Director's Order 12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*).

Background

The NGS is a 2,250 megawatt (MW) coal-fired, steam-electric power plant located approximately 3 miles northeast of Page, Coconino County, Arizona (Figure 1). The plant was constructed in the early 1970s to provide electrical energy for the Central Arizona Project (CAP), a series of canals, pumping plants, dams, and holding reservoirs that deliver Colorado River water from Lake Havasu to Central Arizona, including metropolitan Phoenix and Tucson. NGS, operated by the Salt River Project (SRP), also serves electric customers in Arizona, Nevada, and California. Other participating owners of NGS include Reclamation (24.3%), the Los Angeles Department of Water and Power (21.2%), Arizona Public Service (14.0%), Nevada Power (11.3%), and Tucson Electric Power (7.5%).

Lake Powell, an impoundment of the Colorado River, straddles the Arizona–Utah border north of Page and began filling following the completion of Glen Canyon Dam in 1963. Glen Canyon Dam was authorized for the purposes of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power under the Colorado River Storage Project Act of 1956, Section 1, 43 U.S. Code (USC) 620. Lake Powell is the second-largest reservoir in the United States; at full pool, 3,700 feet elevation, it holds 27 million acre-feet of water (NPS 2004). NGS was constructed near Lake Powell to ensure it had a dependable supply of cooling water for its three generators. When NGS was constructed, it received an annual allotment of 34,100 acre-feet of water, and the intakes that pump water from the lake to the plant were installed at a maximum elevation of 3,470 feet, 230 feet below the lake's full pool level.

Climatic fluctuations have profound effects on water resources in the arid southwestern United States. Since the start of a persistent drought around the turn of the century, inflows to Lake Powell have been consistently well below average, leading to a drawdown of the lake that continues to the present. Tree-ring records coupled with new data on drought frequency indicate the current drought could continue for several more years (Webb et al. 2004), and from 2000 through 2004 and in 2006, inflow to Lake Powell was well below its long-term average (Reclamation 2007). One of the purposes of Lake Powell under the Colorado River Storage Project Act of 1956 is to meet the Upper Colorado Basin requirement to deliver water to the Lower Basin states, and these deliveries have continued throughout the drought. As a combined result of the drought and the legally mandated water releases, the lake has dropped from nearly full in 1999 to 47 percent of capacity in mid-March 2007, with the current lake elevation at 3,598

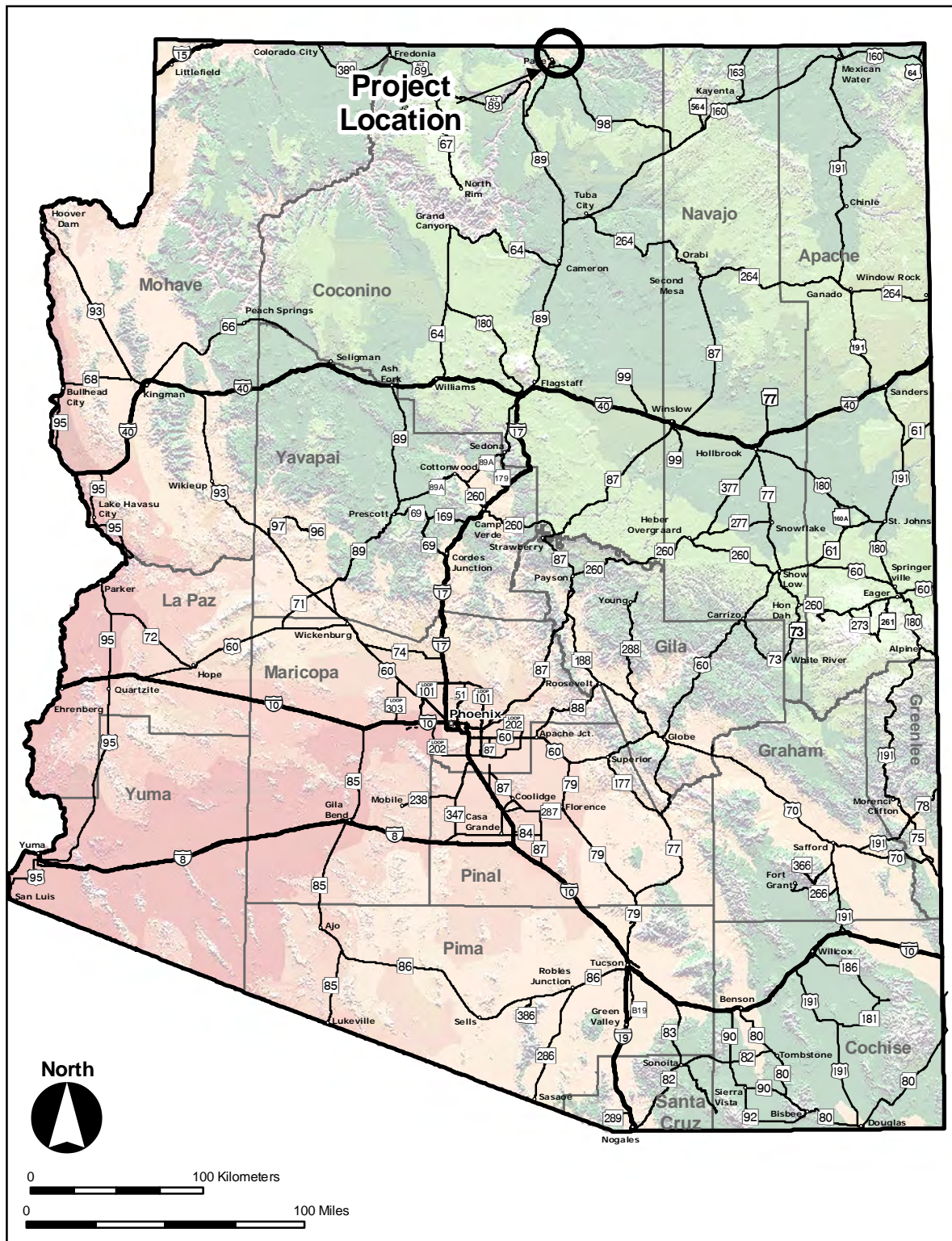


Figure 1. Project location.

feet, only about 100 feet higher than the minimum level necessary for the NGS water intake pumps to remain operational. Current projections using Reclamation methods indicate the lake surface elevation could fall below the existing NGS water intake minimum elevation of 3,498 feet by April 2010 if the existing low inflow volumes to Lake Powell continue. These reduced lake levels could be reached as early as April 2009 if severe drought conditions persist.

SRP and the other owners of NGS propose to maintain access to their Lake Powell water supply by modifying the water intake system of NGS to account for the unexpected drop in reservoir level. The new intakes would be located approximately 120 feet lower in the “dead pool” of Lake Powell. The dead pool is the lowest part of the reservoir elevation where some water is still stored behind the dam, but the water cannot be released downstream because it is at an elevation lower than the dam’s outlet works.

The water intake site is located in the NE¼ NE¼ SW¼ of Section 15, Township 41 North, Range 9 East, as depicted on the Page, Arizona 7.5-minute U.S. Geological Survey (USGS) Topographic Series (Figure 2). It is a 1-acre parcel of land leased to SRP by the Navajo Nation, at an elevation of 3,734 feet on the cliffs overlooking Lake Powell. The site includes the existing water intake tunnels and a building that houses pumps and electrical transformers. An existing access road extends to the southwest into the adjacent Sections 21 and 22, where it intersects Antelope Point Road. NGS is located north of State Route (SR) 98 in Sections 35 and 36, as well as the adjacent Township 40 North, Range 9 East.

Purpose and Need

Purpose

The purpose of the project is to ensure the future availability of cooling water for NGS operations due to the continuing decrease of the water surface elevation of Lake Powell associated with the ongoing drought.

The proposed project would involve the installation of new water intake facilities on the grounds of the existing pump house facility. The work would include construction of a new water intake system that will allow the withdrawal of lake water from an elevation of 3,339 feet. At this elevation, the intakes would be able to withdraw water from the lake even if water can no longer be released from Glen Canyon Dam.

Need

The southwestern United States is now in the fifth year of an ongoing drought, and this drought, coupled with a requirement to deliver water to the Lower Basin, has caused the water level of Lake Powell to drop dramatically. Current projections using Reclamation methods indicate the level of Lake Powell will drop below the minimum level necessary for operation of the existing NGS water intakes (3,498 feet) by 2010. These reduced lake levels could be reached as early as 2009 if severe drought conditions persist. Climate reconstructions based on the analysis of tree rings indicate that droughts of 10 years or longer are commonplace (Webb et al. 2004).

Without water used as steam in power generation and for cooling the power plant, NGS cannot remain operational. NGS currently provides power to several million customers throughout the Southwest and provides power to pump water to many of the same people in central and southern Arizona. If Lake Powell drops below 3,498 feet, NGS could no longer withdraw water. Thus, drought conditions and declining lake water levels could force the closure of NGS (2,250 MW), a facility that helps ensure the reliability of the CAP and the electrical supply grid of the southwestern United States.

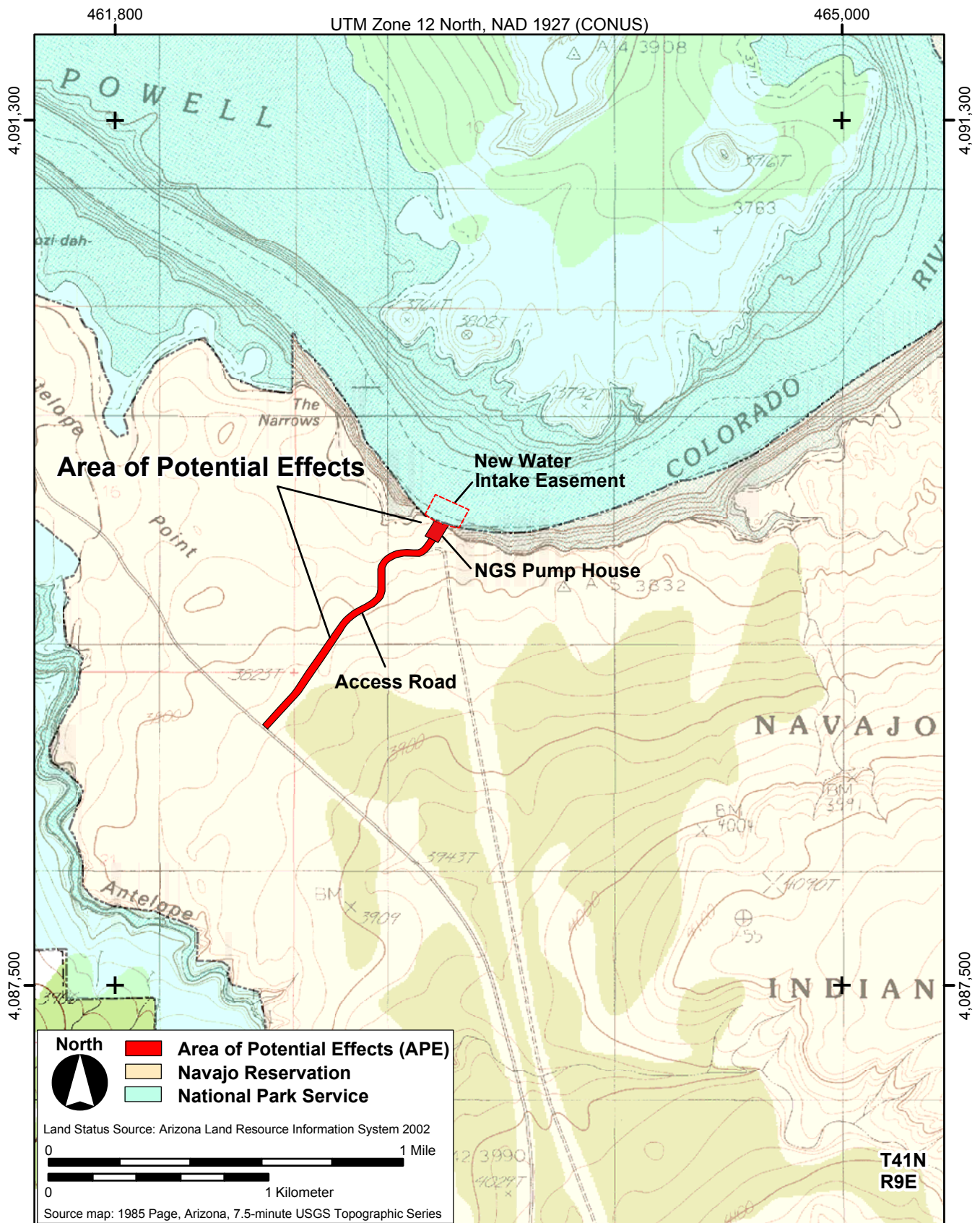


Figure 2. Project vicinity showing land status and APE (scale 1:24,000).

Relationship to Other Planning Projects

On June 24, 2004, SRP submitted a request to Reclamation's Provo Area Office for an expanded easement to accommodate the new water intake system for the Lake Powell Pump Station, Navajo Generating Unit. Reclamation originally granted the existing easement for the current water intake locations to SRP in 1970. Following the establishment of the GCNRA in 1972, NPS and Reclamation executed agreements to clarify the responsibilities of each agency regarding the management of the GCNRA. The agreements, the most recent of which was a Memorandum of Understanding in 2003, assigned the GCNRA land management responsibility to NPS while maintaining Reclamation's management responsibility of Colorado River water, the level of Lake Powell, and the operation of Glen Canyon Dam and associated facilities.

Based on these agreements, NPS is the land management agency responsible for issuing the expanded water intake easement to SRP. Because SRP's original easement was not officially transferred from Reclamation to NPS by the agreements, discussions between NPS and Reclamation concluded that extinguishing the existing easement between SRP and Reclamation, and granting a larger easement to SRP by NPS, would fulfill the SRP request and allow NPS to better administer the land. It was also concluded that the extinguishment and granting of easements could be accomplished in one right-of-way action. As a result, NPS granted SRP an expanded easement in the summer of 2006, after following the NPS NEPA process that concluded with a Finding of No Significant Impact in 2005. This Environmental Assessment/Assessment of Effect is clarifying the previous NEPA process because as work began on the intake shaft, technical conditions, new information, and having the NPS expanded easement made it advisable to change shaft design and drilling techniques.

SRP's proposed water intake project, which is a separate and distinct project that has no relation to a proposed water supply project for the city of Page, is consistent with the objectives identified for the recreation planning zones established in the GCNRA General Management Plan (NPS 1979).

Project Objective

The project objective is to ensure the continued operation of NGS by providing a dependable source of cooling water, even under persistent drought conditions. The project proposes only to modify the location of the water intakes; the electrical generation plant itself will not be modified as part of the proposed action. The plant will not use any additional water, burn additional coal, or produce additional electricity beyond what currently occurs. The new water intake system would help ensure that NGS could continue to provide electrical power to the CAP and the Southwest.

Public Scoping

Scoping is a process to identify the resources that may be affected by a proposed project and to develop possible alternative ways of achieving the project objective while minimizing adverse effects. To that end, the GCNRA conducted both internal scoping with appropriate NPS staff and external scoping with the public and interested groups and agencies.

Internal scoping was conducted by an interdisciplinary team of professionals from the GCNRA, NPS, and members of SRP's project team. Meetings were held on July 6, 2004, and January 11, 2005, to discuss the project purpose and need; various alternatives for installing new water intakes at NGS; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposed installation of new water intakes at NGS and to generate input on the preparation of the Environmental Assessment/Assessment of Effect for the project. The August 23, 2004, letter was distributed to all parties within the general project area that were included on the GCNRA and Reclamation mailing lists. The letter was also mailed to various federal and state agencies, affiliated Native American tribes, and local governments. As a result, eight responses were received from two environmental interest groups and six

concerned citizens. In general, concerns were expressed relative to the potential effect of the project on water quality in Lake Powell. More information regarding scoping can be found in *Comments and Coordination*.

Impact Topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; NPS 2001 *Management Policies*; NPS general knowledge of the resources in the project area; and the public comments and concerns received during and after the public scoping period for the original 2005 Environmental Assessment/Assessment of Effect. As a result, the following resources and values could be affected by development at the water intake site. To identify the potential impacts of the project, these topics are analyzed in the Environmental Consequences chapter.

- Natural Environment (vegetation, wildlife, threatened and endangered species, and species of concern)
- Geology
- Water Quality
- Cultural Resources
- Socioeconomics and Environmental Justice
- Land Use
- Visual Resources
- Hazardous Materials
- Recreational Resources
- Construction-related Impacts (noise, traffic, air, public safety)

Impact Topics Dismissed from Further Consideration

The following impact topics have been dismissed from further consideration because these resources are not present in the project area.

Wetlands

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. In addition, Section 404 of the Clean Water Act authorizes the US Army Corps of Engineers to prohibit or regulate, through a permitting process, the discharge of dredged or fill material or excavation within Waters of the United States. NPS policies for wetlands strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

No wetlands are present in the project area. Therefore, a Statement of Findings for wetlands is not required, and this impact topic has been dismissed.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. In accordance with DO 77-2 *Floodplain Management*, construction within a 100-year floodplain requires the preparation of a Statement of Findings for floodplains.

The proposed water intake installation would be constructed on top of the mesa above Lake Powell and would not be located within a 100-year floodplain. Therefore, a Statement of Findings for floodplains is not required, and this impact topic has been dismissed.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the US Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops, such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to NRCS, the project area does not contain either prime or unique farmland. Therefore, this topic has been dismissed from further consideration.