

Antelope Point Marina & Resort Development Project

ENVIRONMENTAL ASSESSMENT



Navajo Tourism
Department
Division of Economic
Development



National Park Service
Glen Canyon
National
Recreation Area



March 2002

SUMMARY

The Navajo Indian Reservation and Glen Canyon National Recreation Area (NRA) share a lengthy boundary along the southern shore of Lake Powell, the San Juan River, and the Colorado River segment between Glen Canyon Dam and Lees Ferry. To foster cooperative management and development of the Glen Canyon NRA and adjacent Tribal lands, the Navajo Nation, National Park Service, Bureau of Reclamation (BOR), Bureau of Indian Affairs (BIA), and Secretary of the Department of the Interior signed a Memorandum of Agreement in 1970 outlining mutual responsibilities in developing and managing the common areas. The agreement recognized the Navajo Nation's desire to commercially develop areas contiguous to Lake Powell for recreational use and provided for cooperative planning, administration, and development of such recreation sites. The proposed resort development project is along the southern shoreline of Lake Powell at Antelope Point, approximately 2 miles northeast of the City of Page, 3.5 miles southeast of Wahweap, and 2 miles northwest of the Navajo Generating Station.

In October 2000, the Navajo Nation and National Park Service published a prospectus seeking proposals to develop the Antelope Point Marina and Resort Development Project (the Project) consistent with the previously Navajo Nation and National Park Service-approved Development Concept Plan and Environmental Assessment (DCP/EA). In February 2001, the Antelope Holdings, LLC (Antelope Holdings), formerly known as G.M.F. Antelope, LLC (GMF), was the only firm that responded to the prospectus and submitted a formal bid. The Navajo Nation and National Park Service selected Antelope Holdings' proposal to develop and operate this resort and marina.

This environmental assessment (EA) examines three alternatives for the Project: the No Action Alternative (Alternative A); the proposal submitted by Antelope Holdings (the Project developer) to the Navajo Nation and National Park Service (Alternative B); and a modification of Antelope Holdings' proposal that would reduce potential environmental consequences (Alternative C). Alternatives B and C each provide for the development of a floating marina village and boat docks, dry storage for boats, campground and recreational vehicle park, resort hotel and cultural center, optional employee housing, and supporting infrastructure.

Alternative C is the preferred alternative. Implementation of Alternative C would eliminate the off-site wastewater treatment plant thereby reducing potential impacts on cultural resources and water quality under the option to truck wastewater to the City of Page (compared to potential impacts of Alternative B). Alternative C would reduce potential impacts on water resources by eliminating the proposed pool and spa at the marina. Also, impacts on visual resources would be reduced, compared to Alternative B, by providing a larger setback and other aesthetic modifications for the dry storage along the main entry road. Alternative C would not adversely impact prime or unique farmlands, wetlands, or floodplains. Negligible impacts would occur on threatened or endangered species. Negligible-to-minor and adverse impacts from project construction and operations would occur on air quality, wildlife and wildlife habitat, land uses, and a low-income and minority population (the Navajo Nation). Minor and adverse impacts from project construction and operations would occur on geology and soils, water resources, vegetation, cultural resources, public safety, and waste management. Minor-to-moderate adverse

impacts from project construction and operations would occur on the natural soundscape, transportation and traffic, and visual resources. Minor-to-moderate beneficial impacts from project construction and operations would occur on area employment and housing, recreational resources, and a low-income and minority community. Construction-generated impacts would be short term, and generally minor in intensity. Operational impacts would occur for the life of the project, and would range from negligible to moderate in intensity depending on the resource affected.

Note to Reviewers and Respondents

If you wish to comment on the EA, you may mail comments to the names and addresses below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home addresses from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

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LIST OF ACRONYMS

ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
AQRV	Air quality related values
BIA	Bureau of Indian Affairs
BOR	Bureau of Reclamation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CGP	Construction General Permit
CWA	Clean Water Act
dB	Decibel
dB(A)	A-weighted decibel scale
DCP	Development Concept Plan
DCP/EA	Development Concept Plan/Environmental Assessment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
°F	Degrees Fahrenheit
FC	Fecal coliform
FOIA	Freedom of Information Act
FWS	U.S. Fish and Wildlife Service
GCAN	Glen Canyon Action Network
GMP	General Management Plan
gpd	gallons per day
gpm	gallons per minute
HFC	Hydro fluorocarbon
LEED	Leadership in Energy and Environmental Design
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding

LIST OF ACRONYMS

NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Grave Protection and Repatriation Act
nd	no date
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NFWD	Navajo Fish and Wildlife Department
NHPA	National Historic Preservation Act
NNDED	Navajo Nation Division of Economic Development
NNEPA	Navajo Nation Environmental Protection Agency
NNHPD	Navajo Nation Historic Preservation Department
NNPRD	Navajo Nation Parks and Recreation Department
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
OHV	Off-highway vehicle
ppb	Parts per billion
Ppm	Parts per million
PWC	Personal watercraft
RCRA	Resource Conservation and Recovery Act
RFQ	Request for Qualifications
RRU	Recreation and Resource Utilization
RV	Recreational vehicle
SEVA	SEVA Corporation
SHPO	State Historic Preservation Office
SR	State Route
SRB	Sustainability Review Board
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional cultural place
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
UDEP	Utah Department of Environmental Protection
µg/m ³	Micrograms per cubic meter
WLAN	Wireless local area network
WWTP	Wastewater treatment plant

1.0 PURPOSE AND NEED

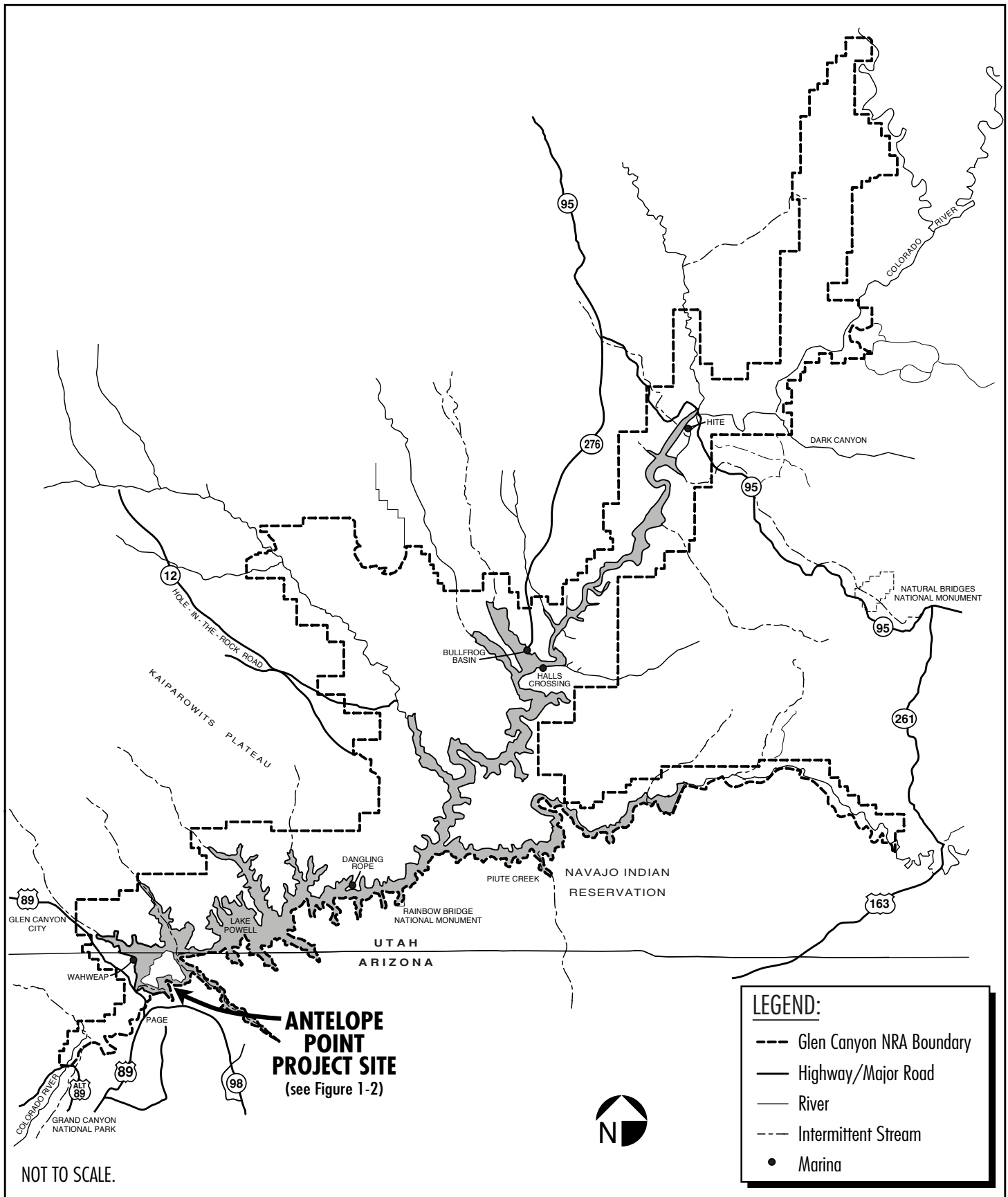
1.1 BACKGROUND

The Glen Canyon National Recreation Area (NRA) and Navajo Indian Reservation occupy a combined 17.2 million acres of northern Arizona, southern Utah, and northwestern New Mexico. The Glen Canyon NRA encompasses 1.2 million acres and is administered by the National Park Service (Figure 1-1). The NRA was established in 1972 to provide public outdoor recreation opportunities on Lake Powell and adjacent lands. The principal feature of the area is Lake Powell, formed by Glen Canyon Dam constructed on the Colorado River at Page, Arizona for the purpose of creating a reservoir. Secondly, the lake and dam provide recreation, flood control, irrigation, and hydroelectric power generation. The Glen Canyon NRA headquarters is located in Page, Arizona.

The Navajo Indian Reservation was established by treaty as the Navajo Tribal homeland in 1868. The Navajo Indian Reservation encompasses nearly 16 million acres in three states. This acreage has a current population of approximately 180,000 (U.S. Census Bureau 2000) and is held in trust by the United States of America. The Navajo Nation government located in Window Rock, Arizona, is responsible for Navajo governmental affairs.

The Navajo Reservation and Glen Canyon NRA share a lengthy boundary along the southern shore of Lake Powell, the San Juan River, and the Colorado River segment between Glen Canyon Dam and Lees Ferry. To foster cooperative management and development of the Glen Canyon NRA and adjacent Tribal lands, the Navajo Nation, National Park Service, Bureau of Reclamation (BOR), and Bureau of Indian Affairs (BIA) signed a Memorandum of Agreement (MOA) in 1970 outlining responsibilities in developing and managing lands adjacent to Lake Powell. The Secretary of the Department of the Interior approved this MOA. The agreement recognized the Navajo Nation's desire to develop areas contiguous to Lake Powell for recreational use and provided for cooperative planning, administration, and development of such sites.

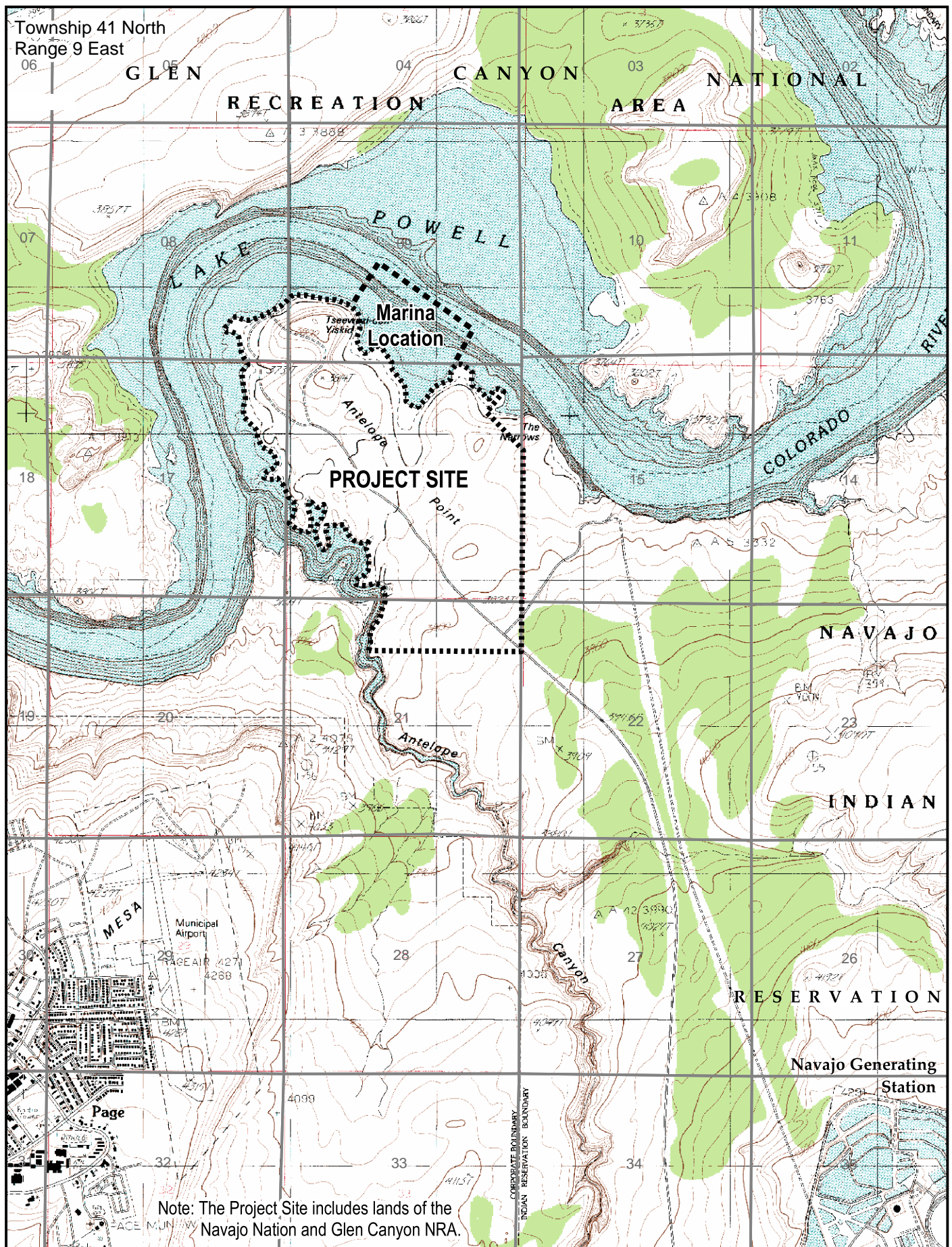
In 1979, National Park Service (NPS) developed a General Management Plan (GMP) for the Glen Canyon NRA (NPS 1979). The primary objective of the GMP was "to manage the recreation area so that it provides maximal recreational enjoyment to the American public and their guests." Another objective of the GMP was "to cooperate with the Navajo Nation in managing and developing the southern shoreline of Lake Powell for recreational use." With consideration of these objectives, the GMP designated six potential development sites along the southern shoreline of Lake Powell, one of which was Antelope Point, Arizona. Provisions of the 1970 MOA restricted the development site to the area contiguous and within the 1-mile limit extending from the NRA boundary, which is the 3,720-foot contour line, onto adjacent Navajo Nation lands. Based on these provisions, the Antelope Point project site (Antelope Point) encompasses approximately 950 acres (Figure 1-2); 710 acres are Navajo Nation lands and approximately 240 acres are administered by the National Park Service at Glen Canyon NRA.



Sources: Glen Canyon NRA GMP 1979.
USGS 7.5 Minute Quadrangle for Page, AZ, 1985.
Antelope Point DCP/EA 1986.

GLEN CANYON NRA

Figure 1-1



Sources:
USGS 7.5-Minute Quadrangle for Page, AZ, 1985.
Antelope Point DCP/EA 1986.

In 1983, the National Park Service conducted a study to assess the economic feasibility of development at the six sites identified in the GMP. The study concluded that Antelope Point was the most economically feasible of the six sites for development because it has developed road access to the site and with nearby US 89 and State Route 98 (SR 98). Access is not a feature of any of the other five sites.

In 1985, decisions by the Navajo Nation Council to proceed with planning for a recreational development at Antelope Point led to the preparation of the Antelope Point Development Concept Plan/Environmental Assessment (DCP/EA) in 1986 (NPS 1986). The DCP/EA was prepared jointly by the Navajo Nation and National Park Service, as both Navajo Nation and Glen Canyon NRA lands were included in the proposed Antelope Point project area. The DCP/EA assessed the feasibility of the development concept and alternatives, and potential social and environmental effects that may result from development. The EA was tiered from the environmental impact statement (EIS) associated with the GMP (NPS 1979).

In late 1986, the National Park Service and the Navajo Nation selected a company to undertake development at Antelope Point in conformance with the DCP/EA, and the SEVA Corporation (SEVA) was granted a 30-year business site lease by the Navajo Nation. Concurrently, the National Park Service granted a 20-year concession contract to the Navajo Nation for development and operation of the water-based elements of the proposed project, which were to be assigned to SEVA through a sub-concession agreement. Subsequent to the execution of these agreements, one of the principal investors in the SEVA entity died and SEVA was materially restructured thereafter. By late 1989, SEVA had been unable to secure the financing needed to initiate the project. In late 1995, due to lack of financing and other reasons, the parties released each other from future claims, and both the concession contract and the business site lease were canceled, freeing the Navajo Nation and National Park Service to pursue development at Antelope Point with another company.

Over the next five years, the Navajo Nation and National Park Service continued pursuit of a development at Antelope Point. As part of this effort, BIA was enlisted to assist with major infrastructure developments that would be needed to support a marina and resort development at Antelope Point. The Navajo Nation, National Park Service, and BIA then embarked on a coordinated development program, which resulted in an investment of over \$5.5 million for major infrastructure construction. This included a finished roadway from the junction of Highway 98 to the proposed entrance site, construction of a public launch ramp, adjacent parking, toilet facilities in a shoreline day use area, a fee station, establishment of water wells at the site, and an agreement with Navajo Tribal Utility Authority for the provision of electrical power service to the site. The existing facilities at Antelope Point are described in more detail in Chapter 2, under Alternative A, the No Action Alternative.

The Navajo Nation and National Park Service also coordinated efforts to develop separate, yet coextensive, agreements consistent with existing federal and Navajo Nation laws for offering a parallel business site lease and concession contract terms for development and operation with a jointly selected developer/operator. In the interim, substantial changes in federal law relating to

National Park Service Concession Contracting and the need to issue new Code of Federal Regulations (CFR) directives caused some delay issuing the offering.

In October 2000, the Navajo Nation and National Park Service published a prospectus seeking proposals to develop the Antelope Point Marina Resort and Development Project (the Project) consistent with the previously approved DCP/EA and a Phase I request for qualifications (RFQ). In March 2001, the Navajo Nation and National Park Service selected Antelope Holdings, LLC's (Antelope Holdings) proposal to develop and operate this resort and marina (Antelope Holdings, LLC was formerly known as G.M.F. Antelope, LLC). Antelope Holdings' proposal to develop a marina, resort hotel, campground, and other associated amenities is described in Section 2.2, Alternative B (the Proposal).

In accordance with the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations, federal agencies must consider the effects of their actions and decisions on the quality of the human environment. With respect to this project, the Navajo Nation and National Park Service have prepared this EA to analyze the anticipated environmental impacts associated with implementation of each alternative considered (including No Action, Antelope Holdings' Proposal, and the Preferred Alternative) for the Antelope Point Project site.

1.2 PURPOSE AND NEED FOR ACTION

1.2.1 Purpose

The purpose of the Project is to implement the objectives of the Glen Canyon NRA GMP and provide economic development opportunities for the Navajo Nation. The specific objectives of the GMP are as follows:

- X cooperate with the Navajo Nation in managing and developing the southern shoreline of Lake Powell for recreational use;
- X manage the recreation area so that it provides maximal recreational enjoyment to the American public and their guests;
- X maximize the recreational experience and the number of opportunities for enjoying the recreation area;
- X provide the richest possible interpretive experience to visitors to the recreation area;
- X accommodate many varieties of use, but favor water-oriented recreation;
- X create varying kinds and uneven intensities of use along the length of the reservoir and throughout other portions of the recreation area; and
- X interpret historical and archeological resources and the culture of aboriginal societies, while centering interpretive themes around outdoor recreation.

The provision of economic development opportunities for the Navajo Nation would be consistent with goals of the Navajo Nation Division of Economic Development by:

- X providing sustainable employment and tourist related business opportunities for the Navajo people; and
- X increasing the awareness and visitation to the Navajo Nation as a destination.

The purpose of this EA is to analyze site-specific impacts that would result from the Project.

1.2.2 Need

The need for the proposed development stems from: (1) the commitment of the National Park Service to implement the terms of the 1970 MOA and comply with the previously approved Antelope Point DCP, by approving development that would serve recreational uses at Antelope Point; and (2) the lack of a strong and diverse economic base within the Navajo Nation, which can be remedied partially by the revenue generated from the Project.

The Navajo Nation, the second largest American Indian Tribe in the United States, is, according to United States government statistics, economically disadvantaged. Since the Economic Recovery Act of 1981 and the Gramm-Rudman initiatives, there has been a substantial reduction in federal funding to tribes, and continued decreases are anticipated. The Navajo Nation recognizes it must develop programs and projects that generate revenue for producing sustainable growth, building economic self-sufficiency, and reinvesting in further productive activities. Over the life of the Project, annual revenues will provide funds for the Navajo Nation to allow for investment in other business opportunities. Further, development of Antelope Point would provide short-term employment for members of the Navajo Nation during construction and long-term employment for operations in a region that has an unemployment rate of approximately 44 percent (on the Navajo Reservation) (Choudhary 2000).

1.3 RELATIONSHIP TO OTHER PLANNING PROJECTS

1.3.1 General Management Plan

The Glen Canyon NRA is currently operating pursuant to the 1979 GMP. Antelope Point is designated as a potential development site in the GMP, and any recreational development at Antelope Point would be consistent with and supported by the GMP. Further, Antelope Point is located on Navajo Nation lands along the southern shoreline of Lake Powell, and the GMP specifically sets the objective to “cooperate with the Navajo Tribe in managing and developing the southern shoreline of Lake Powell for recreational use.” The Project would be consistent with other objectives of the GMP, including the following (numbering added for reference only):

1. Manage the recreation area so that it provides maximal recreational enjoyment to the American public and their guests (Level I Objective),
2. Maximize the recreational experience and the number of opportunities for enjoying the recreation area (Level II Objective),

3. Provide the richest possible interpretive experience to visitors to the recreation area (Level II Objective),
4. Accommodate many varieties of use, but favor water-oriented recreation (Level III Objective),
5. Create varying kinds and uneven intensities of use along the length of the reservoir and throughout other portions of the recreation area (Level III Objective),
6. Interpret historical and archeological resources and the culture of aboriginal societies while centering interpretive themes around outdoor recreation (Level III Objective), and
7. Encourage the maintenance of high water quality in all bodies and sources of water and to perpetuate the natural flow of free water (Level III Objective).

The Project meets Objectives 1 and 2 by providing additional access to Lake Powell and increasing opportunities for boating, fishing, and other recreation. The Project includes design features to highlight the Navajo culture, as well as a cultural center for Navajo artisans, meeting Objectives 3 and 6. Objective 4 would be achieved because the proposed marina, which favors water-oriented recreation, is one of the major project components. Project development would increase the diversity of uses along the shoreline where little development currently exists; this would support Objective 5. Objective 7 would be met because existing uses that contribute to waste and erosion along the shoreline would cease, and protective measures would be implemented during construction and operation of the Project to ensure water quality is not degraded.

1.3.2 Antelope Point Development Concept Plan / Environmental Assessment

The Antelope Point DCP/EA (1986) is considered the guidance for future development at Antelope Point. The DCP/EA guided the Navajo Nation and National Park Service in generating the prospectus for seeking proposals to develop recreational facilities at Antelope Point. The DCP's main objectives were to evaluate appropriate development and management alternatives; delineate and provide preliminary design parameters of facilities and appurtenances, including utilities; and evaluate the social and environmental impacts of implementing the plan. The rationale behind the selection of the preferred alternative or "proposal" was based on its ability to (1) provide the Navajo Nation with job opportunities, economic diversity, and long-term income while serving unmet visitor recreational demand within the National Recreation Area and (2) the development scale, site configuration, and project specifications that provide for an attractive and aesthetic development area with a great variety of visitor uses and interpretative opportunities that are economically sound and viable. Any development will be consistent with the Antelope Point DCP/EA.

1.3.3 Carrying Capacity Study

In addition to the GMP and the Antelope Point DCP/EA, National Park Service personnel at Glen Canyon NRA analyzed the carrying capacity of Lake Powell and reported the results in a study titled, *The Carrying Capacity of Lake Powell: A Management Analysis of Capacity for*

Boater Recreation (1987) (“the Carrying Capacity Study”). The Carrying Capacity Study provides launch rate limitations for each of Lake Powell’s 13 visitor use zones, constraining the number of vessels launched from each of these areas. Antelope Point is located within Zone 2. Wahweap and Stateline are located in Zone 1. Despite being located in different zones, Antelope Point could be expected to tap the same pool of boating recreationists that currently use the Wahweap Marina (NPS 1986). The approved marina launch capacity for Antelope Point is 240 launches per day; Wahweap has a capacity of 870 launches per day. The Carrying Capacity Study determined that the maximum launches from Antelope Point and Wahweap could increase beyond their currently approved capacities with the implementation of additional management measures to protect the lake shoreline, water quality, and other limited resources.

The Carrying Capacity Study is a management analysis that incorporates physical, safety, resource, and social factors to arrive at use limits expressed as “boats-at-one-time” allowable in visitor use zones of the lake. The study identifies the most limiting factor in each visitor use zone and apportions that limit among the several marinas using a boater distribution table. Adding the marina shares for all zones yields a composite “maximum” launch rate consistent with the lake’s carrying capacity. Because boater access to Lake Powell is significant only at the developed marinas, these limits may be used by management to contain maximum marina boat-launching capacities to levels that will maintain recreational quality and resources values. The capacity estimates are directly useful in evaluating development expansion proposals and providing a reasoned, documented basis for determinations of maximum marina sizes.

The study also provided the management conditions under which the lake’s capacity for additional boater use may be increased. Subsequent to the Carrying Capacity Study, the National Park Service implemented a Water Quality Program at Glen Canyon NRA that prohibits dumping waste into the lake, developed a Beach Monitoring Program that requires beach closure when high levels of bacterial contamination are measured, and placed floating pump-outs on the lake for collection of boat wastewater to prevent illegal dumping. These mitigation measures permit the number of allowable boats-at-one-time in the zone to increase. This increase can be traced back to an increase in maximum allowable marina launch rates using methods outlined in the study.

1.4 PUBLIC INVOLVEMENT

The public’s involvement has been integral in the formation of alternatives for development at Antelope Point. Public scoping for this EA included a public workshop on the Project held on September 14, 2001, in Page, Arizona. The workshop was announced through a press release issued by the National Park Service (at Glen Canyon NRA) and the Navajo Nation on August 28, 2001, as well as through printed scoping notices mailed to approximately 240 addresses prior to the public workshop. Attendance at the public workshop totaled 17 individuals. Interested parties were asked to submit any written comments by October 14, 2001. One written comment was received during the public workshop. Additional written comments were received from 86 individuals after October 14, 2001.

In addition to the public workshop, the Navajo Nation Division of Economic Development (NNDED) and National Park Service presented information about the Project at regular meetings

of six Navajo Nation Chapters (Lechee, Shonto, Coppermine, Inscription House, Navajo Mountain, and Gap/Bodaway) to inform approximately 300 members of the Navajo Nation about the Project and the EA process. Presentations were made at meetings between September 10 and November 14, 2001 (refer to Chapter 5).

Issues identified during the public workshop and concerns raised by members of the Navajo Nation are summarized below in Section 1.6.

1.5 PROJECT OBJECTIVES

The objectives that must be achieved for the selected project alternative to be considered a success are as follows:

- X provide additional recreation opportunities and access, consistent with the Antelope Point DCP/EA, which satisfy the needs of the visiting public and support the preservation of Lake Powell and all the resources at the Antelope Point site for future generations;
- X provide the people of the Navajo Nation with an opportunity for sustainable economic development of their lands, tourism resources, and local enterprises; and
- X provide the visiting public with a quality marina and resort that provides exceptional services at rates that are fair and consistent with the cost and quality of the offering.

1.6 ISSUES AND IMPACT TOPICS ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT

1.6.1 Issues

Prior to initiating formal public scoping, the Navajo Nation and the National Park Service at Glen Canyon NRA identified topics for analysis in the environmental assessment based on their knowledge of the Project area, current resource management issues for the NRA, and impacts previously characterized in the Antelope Point DCP/EA (1986). The list of topics that the Navajo Nation and National Park Service developed included: air quality; water resources; geology and soils; vegetation; wildlife; special status species; land use; soundscapes; recreation; visual resources; social and economic conditions; and, cultural resources. This was a preliminary list of topics that was presented to the public during scoping.

Before formal public scoping, the National Park Service received letters from the Glen Canyon Action Network (now Living Rivers) and the Diné Medicineman's Association, Inc. regarding development at the Antelope Point Project site. The Glen Canyon Action Network letter indicated that specific issues needed to be addressed prior to development of the marina and resort and campground, particularly:

- impacts on water quality;
- air quality impacts;

- impacts on cultural resources;
- safety of boaters; and,
- socioeconomics.

The letter from the Diné Medicineman's Association, Inc. identified several concerns related to the Project, specifically:

- impacts on cultural resources;
- social impacts resulting from the sale of alcoholic beverages;
- impacts on air and water quality; and,
- whether the Project would provide sustainable economic development for the Navajo Nation.

The only written comments received during the public workshop were from a representative of Living Rivers, the organization formerly known as Glen Canyon Action Network. These included:

- encouragement of Navajo preference for employment with fair and competitive wages;
- consideration of the possibility of considering an alternative that would allow the Navajo Nation to take over management/operation of the Wahweap marina; and
- alternative land uses for Antelope Point, specifically, such as education and/or health care facilities such as a clinic and/or traditional healing center that is geared to specific Navajo cultural needs, which can provide long-term economic benefits (e.g., job training and environmental benefits).

During and following public scoping, Navajo Nation Division of Economic Development and National Park Service staff attended Navajo Nation Chapter House meetings to explain the development proposed for Antelope Point. The concerns of Navajo Nation members identified during these meetings focused on the increased demand for public safety and law enforcement services, effects of increased visitation on Rainbow Bridge and Navajo Mountain communities, ceremonial sites in the Project area, and the sale and consumption of alcohol on the Navajo Reservation.

The National Park Service at Glen Canyon received additional comments regarding the Project during and after the public scoping period that was from August 28 through October 14, 2001. These comments identified issues similar to those identified during scoping.

1.6.2 Impacts

Based on public comments and concerns received by the National Park Service and the Navajo Nation during and following scoping, the resources and values that could potentially be at stake in selecting a development alternative were identified. These became the topics analyzed in this assessment to identify the potential impacts of the Project and are listed below:

- X Air quality
- X Geology and soils
- X Water resources
- X Vegetation
- X Wildlife and wildlife habitat
- X Special status species
- X Cultural resources
- X Public safety
- X Natural soundscape
- X Transportation and traffic
- X Visual resources
- X Socioeconomics, including land use and environmental justice
- X Waste management

Summaries of the existing conditions at Antelope Point relative to these topics are provided in Section 3, Affected Environment.

1.7 IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Issues and concerns affecting this project were identified by the Navajo Nation Environmental Protection Agency (NNEPA) and National Park Service (NPS) specialists, as well as from the input of other federal, state, and local agencies. After public scoping, issues and concerns were distilled into distinct impact topics to facilitate the analysis of environmental consequences, which allows for a standardized comparison among alternatives based on the most relevant information. The impact topics were identified on the basis of federal laws, regulations, and orders; NPS *Management Policies 2001*; and National Park Service staff's knowledge of resources. The rationale for dismissing specific topics from further consideration is given below.

1.7.1 Prime and Unique Farmlands

In August 1980, the CEQ directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (then the Soil Conservation Service) as prime or unique. Prime or unique farmland is defined as soil that produces crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to BIA (nd) the soils are classified as "Typic torripsamment mixed mesic" soil, which is sandy, undeveloped soil rated unsuitable for sustained irrigation. Therefore, areas affected by proposed development at Antelope Point are not suitable for growing crops and would not be considered

prime or unique farmlands, and the topic of prime and unique farmland is not addressed as an impact topic in this EA.

1.7.2 Wetlands

Executive Order 11990, *Protection of Wetlands*, requires federal agencies to avoid, where possible, impacts on wetlands. Proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings. There are no jurisdictional wetlands within the proposed development site at Antelope Point. Therefore, the topic of wetlands was dismissed as an impact topic, and a Statement of Findings for wetlands was not prepared.

1.7.3 Floodplains

Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. Prior to development of the access road to Antelope Point (from SR98), a wash crossed by the road was known to be subject to flash flooding. There are no other known flood hazard zones, springs, or surface waters (other than Lake Powell) in the area. No changes along the recently improved access road are proposed and, therefore, no impacts on floodplains are expected. Floodplains are not discussed further in this EA.

2.0 ALTERNATIVES CONSIDERED

This chapter of the environmental assessment (EA) outlines three alternatives for development at Antelope Point. Under Alternative A (No Action), the Antelope Point site would remain unchanged, except for existing operations and maintenance. Alternative B (the Proposal) is the proposal submitted by Antelope Holdings, LLC (Antelope Holdings) in February of 2001 to the Navajo Nation and National Park Service. Alternative C (the Preferred Alternative) was developed by modifying Antelope Holdings' Proposal and adjusting certain actions as detailed, site-specific planning for the area was undertaken. Descriptions of Alternative B and Alternative C are based on concepts, rather than final designs. If an action alternative were selected, design would begin after appropriate contractual agreements are in place. This chapter also includes a description of alternatives considered but dismissed (Section 2.4), a rationale for the environmentally preferred alternative (Section 2.5), comparison of the components and the impacts for each alternative (Section 2.6), regulations and policies applicable to all alternatives (Section 2.7), and mitigation measures common to all action alternatives (Section 2.8).

2.1 ALTERNATIVE A (NO ACTION)

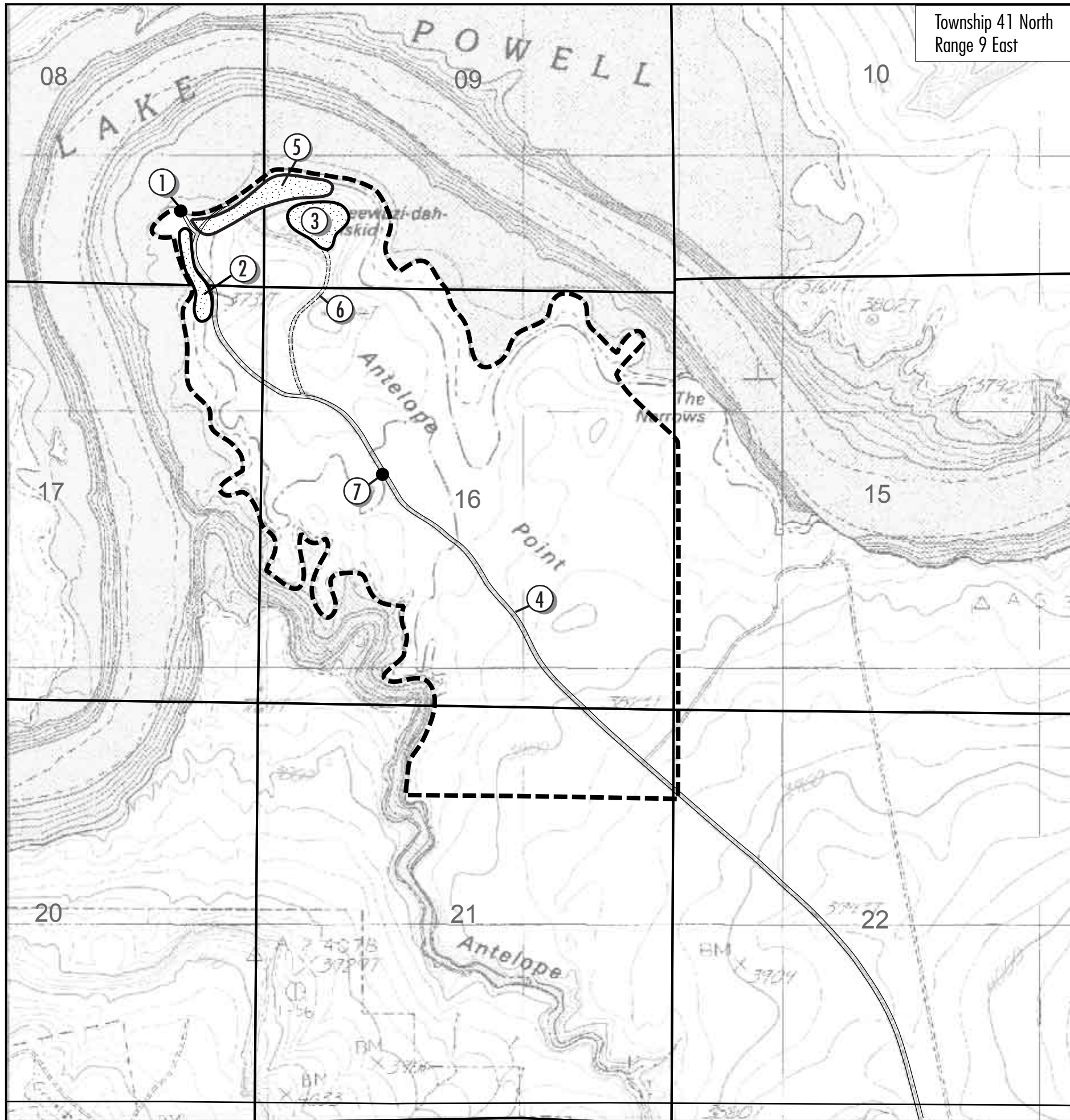
The No Action Alternative would maintain the existing conditions at Antelope Point including continuing operation and maintenance of the following:

- X two vaulted toilets (with capacities of 1,000 gallons each)
- X one portable toilet dump station
- X four movable microflush toilets at two stations (with capacities of 300 gallons each)
- X a public launch ramp
- X gravel parking for 383 vehicle/trailers (scheduled for paving in Spring 2002)
- X 0.5 mile of graveled beach access road
- X 3 miles of post and cable
- X two courtesy docks with walkways
- X two breakwaters (tires) 200 feet each
- X three solar street lights
- X one information shelter
- X one fee station (including a staff restroom)
- X a paved access road to the public launch ramp area
- X an abandoned gravel pit site
- X an unpaved spur road from the entry road to the gravel pit site

Alternative A is shown on Figure 2-1.

Currently the National Park Service manages for solid waste and wastewater pick-up and disposal at the Glen Canyon National Recreation Area (NRA). Solid waste is collected daily in the summer and weekly in the winter. Wastewater from the vaulted toilets is collected about twice annually; wastewater from microflush toilet tanks is pumped out weekly.

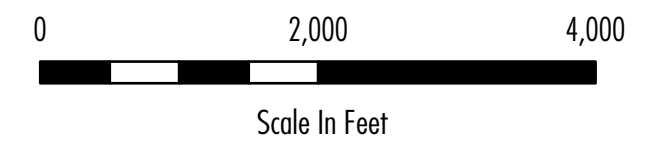
Alternative A No Action



LEGEND:

- Antelope Point Project Site Boundary*
- Section Lines
- ① Public Launch Ramp
- ② Public Parking
- ③ Gravel Pit
- ④ Main Entry Road (paved)
- ⑤ Day Use Area (with toilet facilities)
- ⑥ Dirt Road
- ⑦ Fee Station

*The Project Site includes lands of the Navajo Nation and Glen Canyon NRA.



Sources:
USGS 7.5-Minute Quadrangle for Page, AZ, 1985.
Antelope Point DCP/EA 1986.

Figure 2-1

No marina, campground, hotel and cultural center, or additional facilities or infrastructure would be developed under Alternative A. The open gravel pit area would not be reclaimed and developed, but would remain a visual intrusion in the area. Only the primitive facilities shown on Figure 2-1 would serve recreational users; no additional public safety facilities and personnel would be present to serve the site and site visitors. Current uses of the site would continue, including informal camping, which contributes to degradation of the site (e.g., garbage strewn around the site, vegetation trampling, erosion).

This alternative would not provide an economic development opportunity through either recreation or tourism for the Navajo Nation, nor would it provide maximal recreational enjoyment to the American public and its guests. Alternative A would not maximize recreational opportunities, provide the richest interpretive experience, nor accommodate a wide variety of uses. Therefore, Alternative A would not meet the Project objectives for the Navajo Nation or Glen Canyon NRA.

2.2 ALTERNATIVE B (PROPOSAL)

The Antelope Holdings Proposal includes facilities and services related to the development and operation of an integrated marina and resort, which would be developed over approximately five to eight years. Facilities include a marina village, dry storage area, campground and recreational vehicle (RV) park, resort hotel and cultural center, employee housing, and supporting infrastructure, including a wastewater treatment plant (WWTP). The locations of facilities proposed under Alternative B are shown on Figure 2-2. The Antelope Holdings conceptual plan for these and other proposed facilities is provided on Figure 2-4, which is included in Section 2.3. The initial development phase would include a marina, dry storage area, and campground, and would be built in two-to-three years. The second development phase would include a hotel and cultural center, and would be built within three-to-five years following completion of the initial phase. Mitigation measures that would be implemented as part of the Proposal have been incorporated from the Draft Environmental Management Plan (URS 2001) and from the Draft Standards and Guidelines for Sustainability for Antelope Point (Hudgins 2001). These measures are included in Section 2.8, unless unique to an alternative.

2.2.1 Marina

The primary marina services would be located on a central floating platform and two pivoting and floating docks located on opposite sides (north and south) of the central platform (the “Marina Village”). The central platform would occupy about 0.5 acre; the entire marina would occupy about 78 acres. The facilities and services available at the Marina Village would include a marina store, full-service restaurant, public restrooms, management offices, first-aid center, 300 private rental slips with private shower/toilet facilities on each row, covered fuel dock, boat rental docks (170 boats in fleet), fishing dock, boat-towing and repair services, chase-boat services, and a sewage pump-out location. The Marina Village would be constructed of materials that would not leach residues into Lake Powell or experience excessive degradation. The marina would use fixed or floating piers to enhance water circulation. A combination of breakwaters and wakeless areas would be used to manage the waters around the marina; wakeless areas would be

expanded if water levels decreased substantially. Details of the main components of the Marina Village, including its associated boat launch ramp and parking area, are described below.

Marina Village Central Platform and Buildings

The Marina Village platform would occupy approximately 0.5 acre and would include four buildings: marina store, full-service restaurant, management and client services offices, and first-aid center. These four buildings would be grouped around a central courtyard. Other features located on the platform would include a central pond, kiddie pool, and spa. The restaurant would be designed to accommodate dining for 150 people and bar seating for an additional 80 people in a sit-down setting. Alcohol would be available for purchase in the marina store and restaurant. The marina offices would accommodate marina management personnel and boat rental administration. The first-aid building would include space for storage and a security office. Public restrooms would be located within the restaurant and/or the management office. The Marina Village would be accessed by a 12-foot-wide walkway connected directly to land.

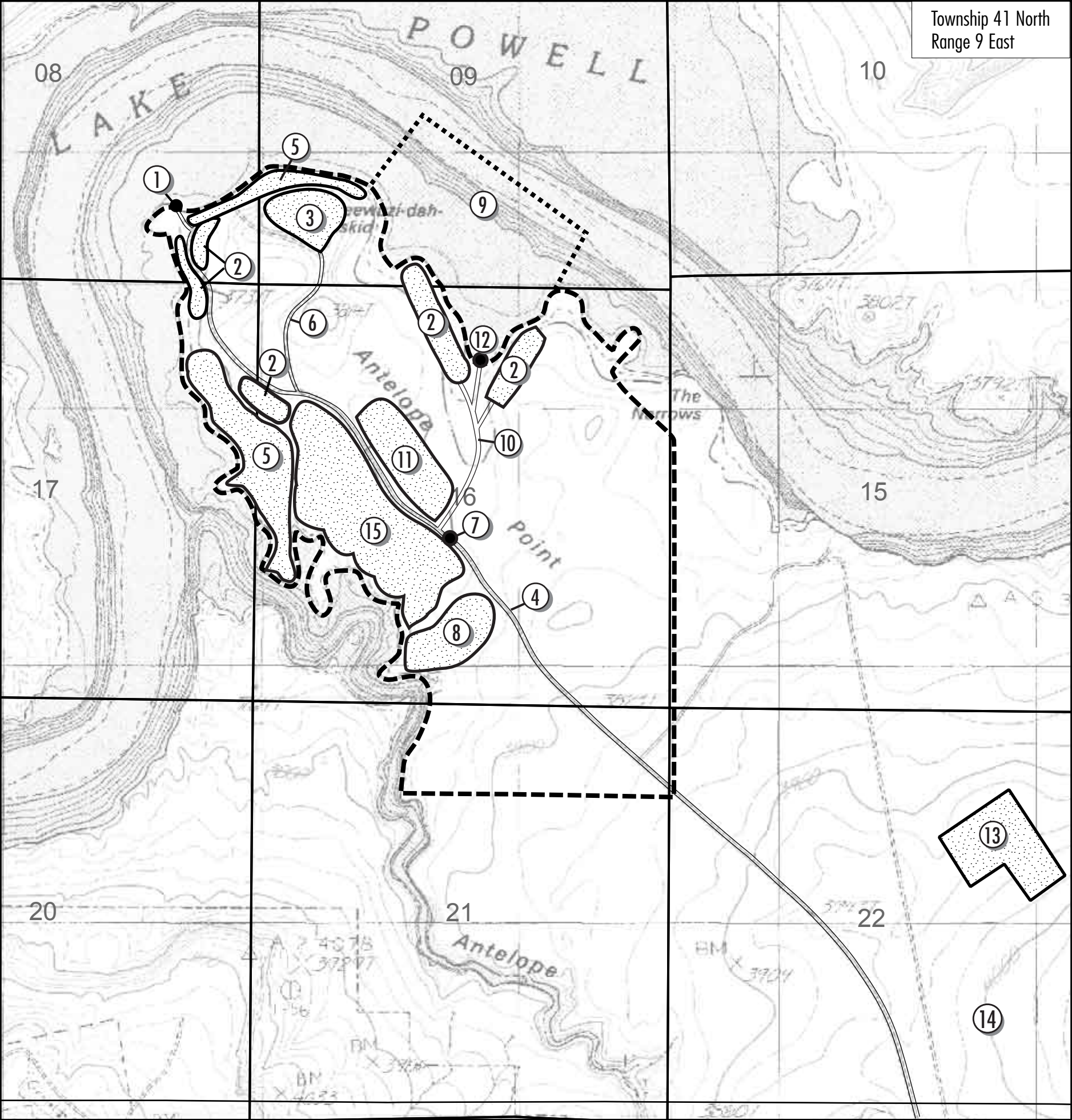
The Marina Village would be constructed on a massive concrete floating platform that would be rigid and would allow for the construction of “on-land” quality buildings. The buildings would have sloped, colored roofs, and would be complementary in style to the other resort buildings. Exterior walls would be painted or colored in deep earthtone colors to blend with the lake and surrounding terrain.

Marina Docks

The dock south of the central marina platform would have 300 private slips in a restricted access area (the “private dock”); the dock north of the central marina platform would have publicly accessible areas (the “public dock”). The access walkways to both the private slips and public marina areas would be 12 feet wide and hinged at their junction with the Marina Village and halfway along their lengths. These hinges would allow both the private dock and public dock to pivot on the water as the lake water level changes. This design would allow unfettered access to the marina at all water levels down to approximately 160 feet below the high-water mark (full pool is 3,700 feet).

The private dock would occupy approximately 6,200 square feet and would include four rows of private rental slips with access controlled by a card-operated gate. Each row of private slips would be accessed from the main 12-foot-wide walkway by a smaller, 10-foot-wide dock walkway. All slips would have a water width of 22 feet. All finger piers would be 4 feet wide. A 15-foot-wide patio would be located at each slip. There would be four rows of slips off each side of the main spine, with a total of up to 300 slips. Each individual slip would be illuminated for safety and have individually metered electrical hook-ups. The private dock also would include eight private toilet/shower rooms (two per row of slips) and a single coin-operated laundry facility. A large percentage of the private slips eventually would be covered (depending on market demand); initially approximately 10-to-20 percent of the slips would be covered. All covers would have a minimum clear height of 22 feet and be constructed of 4-inch-square galvanized steel columns with earthtoned, color-coated, galvanized metal roofing and a 6-inch-side skirt.

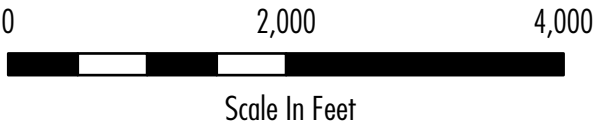
Alternative B Proposal



LEGEND:

- Antelope Point Project Site Boundary*
- Marina Location Boundary
- Section Lines
- ① Public Launch Ramp
- ② Public Parking
- ③ Resort Hotel and Cultural Center
- ④ Main Entry Road (paved)
- ⑤ Day Use Area (with toilet facilities)
- ⑥ Hotel Access Road (paved)
- ⑦ Fee Station
- ⑧ Optional Employee Housing
- ⑨ Marina Village and Docks
- ⑩ Marina Access Road (paved)
- ⑪ Dry Storage, Maintenance Facilities, and Campground Store
- ⑫ Marina Boat Launch Ramp
- ⑬ Wastewater Treatment Plant
- ⑭ Potable Water Storage
- ⑮ Campground and RV Park

*The Project Site includes lands of the Navajo Nation and Glen Canyon NRA.



Sources:
USGS 7.5-Minute Quadrangle for Page, AZ, 1985.
Antelope Point DCP/EA 1986.
GMF 2001.

Figure 2-2

The public dock would occupy approximately 3,400 square feet and would be arranged similar to the private dock with four rows of slips. Additional public facilities would be located along the public dock. In addition to the 170 public slips, the public dock would include a fishing dock, covered fuel dock, boat-rental docks, sewage pump-outs, and courtesy slips. The fishing dock would be located on the walkway from the Marina Village and would be fully covered and equipped with seating, tables, and fish-cleaning stations. The 170 public slips would consist of 100 rental slips for houseboats and 70 rental slips for powerboats; no personal watercraft (PWC) would be included in the marina rental fleet. There also would be additional slips in this area for the Navajo Nation (six slips), commercial operators (10 slips), and slips for three tour boats (including one dinner cruise boat). Lighting would be provided at each slip pedestal for safety.

A fuel dock with individual slips for fueling a mix of 12 powerboats and houseboats would be located on the lakeside end of the first row of the public dock. The floating, covered, fuel dock would be constructed of steel and encased flotation material. The top surface would be built of exposed aggregate concrete, and the structure would be covered by earthtoned, corrugated steel. The fuel dock would be covered to reduce heat and sunlight in the fueling area, which reduces the potential for poor fueling practices by individuals overcome by extreme heat and sunlight (i.e., people who are cooler and protected from the extreme sunlight will pay more attention to their fueling operations, reducing over spills). Two petroleum products would be available at the fuel dock: (1) unleaded 89-octane fuel and (2) diesel fuel. Fuel-storage tanks would be located off the marina structure in an underground storage tank near the marina parking area. The fuel-delivery system would have state-of-the-art leak detection and flow monitors. All piping would be double-walled and joints would be galvanized flex lines. Each dispenser would have a containment pit under the dispenser. A containment chase would carry the double-walled pipe under the dock to each dispenser.

Sewage pump-out services (six pumps) would be available to the public at the fuel dock for a charge. Sewage would be pumped out to a lift station located near the marina parking area, where it would be pumped to an on-site WWTP (described under Section 2.2.6, Supporting Infrastructure). A mobile, floating, sewage pump-out unit that could pump sewage from boats dockside at the slips also would be available. The unit would have a 500-gallon capacity and would be pumped out at the fuel dock.

Marina Boat Launch Ramp and Parking Areas

In addition to the existing public launch ramp off the main entry road at Antelope Point, a second boat launch ramp would be developed as part of Alternative B. This boat launch ramp would be located along the shore, just south of the Marina Village. Parking for the marina launch ramp would occupy approximately 5 acres and would include approximately 400 parking spaces and numerous landscaped areas.

2.2.2 Dry Storage, Maintenance Facilities, and Campground Store

The dry storage area for boats, maintenance facilities, and campground store would occupy a total of 20 acres. These facilities would be located at the intersection of the main entry road and the marina access road (refer to Figure 2-1). The maintenance building would be located within

the dry storage area. The campground store would be located adjacent to and southeast of the dry storage area.

Dry Storage and Maintenance Facility

The dry storage area would occupy up to 12 of the 20 acres and would accommodate up to 500 boats, depending upon the mix of boat sizes. The area would be paved with blacktop and fenced with 7-foot-high, “square-barred” wrought-iron fencing. To improve security, lighting (down-cast and installed on poles with a maximum height of 8 feet to avoid night sky light pollution) and observation cameras would be installed. The dry storage area would be set back between 24 and 40 feet from the main road.

A small building or group of buildings would be adjacent to the storage area to provide minor boat repair services, facility maintenance, and storage for small quantities of hazardous materials and temporary storage of hazardous wastes (e.g., lubricants, pesticides/herbicides, used motor oils). No painting or sanding would occur at this facility, or any facility on the project site, which would limit the wastes generated. Based on an estimation of the amount of hazardous waste that would be generated at Antelope Point (less than 220 pounds per month), the facilities would be classified as a conditionally exempt small-quantity generator under federal laws and regulations.

Campground Store

The campground general store would occupy approximately 5 of the 20 total acres. The general store would serve the campground and RV park immediately across the main entry road. The general store would have self-service gasoline pumps available with both unleaded and diesel fuel.

2.2.3 Campground and Associated Facilities

The campground and RV park would occupy approximately 70 acres and would include RV sites, tent sites, an entry station, laundromat and shower facility, and day-use picnic facilities.

The campground would provide up to 150 full hookup RV sites and 50 tent sites arranged in one-way drive loops oriented perpendicular to existing natural contours at the site (refer to Figure 2-4). Stall lengths at RV sites would be approximately 70 feet in length to accommodate a full range of vehicle/RV trailer configurations and single unit vehicles; tent site stalls would be about 50 feet long. Each RV site would include electrical, water, sewer, and television connections; water for tent site campers would be available from one or two locations in each loop. Each RV and tent site also would include a picnic table and barbecue grill.

Additional campground and RV park features would include the following:

- X asphalt roadways and camping stalls (vehicle parking and camper pad)
- X area lighting (low-angle cutoff fixtures)
- X centrally located restroom/shower facilities (with wastewater delivered to the WWTP)
- X lake access via trails between loops

- X Americans with Disabilities Act (ADA)-accessible facilities
- X RV sewer dump station (with wastewater delivered to the WWTP)
- X boat trailer storage/extra parking
- X day-use facilities with parking area and individual picnic locations
- X fee collection drop box (off-season and summer season off-peak days)
- X entry station (staffed during summer season peak days)
- X laundromat

2.2.4 Resort Hotel and Cultural Center

The hotel would be located on approximately 10 acres near the northernmost part of Antelope Point in a previously disturbed area (gravel pit). During construction of the hotel and cultural center, measures implemented as part of the marina launch ramp and parking area construction (such as industry-established best management practices or a Storm Water Pollution Prevention Plan [SWPPP]) would limit disturbance areas, fugitive dust generation, storm water run-off potential, and impervious areas. These measures are described in Section 2.8. Areas remaining exposed would be revegetated following construction completion.

The hotel would include up to 225 guestrooms, a 200-seat full-service restaurant, on- or off-site laundry services, a snack bar, a small gift and sundry shop, tennis courts, and a cultural center complex with artist studios and an amphitheater. The hotel building would be a two-story circular structure surrounding an inner courtyard, which would house the cultural center and outdoor amphitheater. Activities in the amphitheater would include entertainment at night during the summer. The courtyard also would house a swimming pool, whirlpool spa, fireplaces, and fire pits. One- and two-story artist studios would be located at the west end of the courtyard.

Parking facilities for the hotel, restaurant, and cultural center would be adjacent and to the south of the hotel on up to approximately 4 acres with up to 400 spaces. Parking would be below the grade of the hotel to minimize any impact on views and allow for convenient tie-in to the main entry road. The parking facilities would include landscaped areas and night lighting.

2.2.5 Employee Housing

Employee housing and associated parking areas would be developed if available regional housing is not sufficient to meet the needs of the Project. No design concepts or capacity estimates were included in Antelope Holdings' proposal; however, a conceptual location was proposed (refer to Figure 2-2).

2.2.6 Supporting Infrastructure

The infrastructure to support the facilities described above would include a potable water system, non-potable water system, wastewater management, solid waste disposal, dry utilities, roads, trail system, and Internet access. These are described below.

Potable Water System

The water system would provide potable water to all buildings and facilities at Antelope Point. Water demand for the Marina Village facilities, resort and cultural center, and campground and RV park would be, on average, 70,000 gallons per day (gpd), with a maximum peak hourly demand of 194 gallons per minute (gpm) (not including fire protection events, which would be accommodated by treated effluent). The optional employee housing would demand an unknown amount of additional water. The water supply would likely come from one or two existing on-site wells; the Navajo Nation would provide potable water (based on U.S. Environmental Protection Agency [EPA] standards) to the Project. Each well would provide roughly 125 gpm. Three 75,000-gallon water storage tanks and one 5,000-gallon hydro-pneumatic tank, located outside Project boundaries, would provide water storage. More than 37,000 linear feet of water lines (6- and 8-inch-diameter pipes) would be required for distribution of potable water from tanks to facilities. Water lines would be located in road rights-of-way, utility corridors, and disturbed areas.

Non-Potable Water System

A non-potable water system would be developed to serve for fire protection events and landscape irrigation. The system would include hydrants, service lines to sprinklered buildings, distribution lines, and storage tanks, which would be separate from the potable water system. Supply for this system would come from treated effluent; the non-potable tanks and booster pumps (if any) would be located near the WWTP.

Wastewater Management

The marina, campground, hotel, and associated facilities would be expected to generate an average of 70,000 gallons of wastewater daily. If the optional employee housing were developed, it would generate additional wastewater.

To accommodate wastewater, a WWTP with tertiary treatment would be developed on approximately 25 to 30 acres located about 2 miles southeast of the Antelope Point development area. The selected location for the WWTP is outside the Project boundary established in the 1986 DCP/EA. The WWTP would include a 200,000-gallon treatment lagoon, a tertiary treatment facility, a 300,000-gallon tank (for storing treated effluent for fire protection events), and two 180,000-square-foot evaporation ponds to handle surplus effluent, which would not be used for landscape irrigation or fire protection. An estimated 10 percent of the treated effluent would be used for landscape irrigation. Use of the reclaimed water would require up to 17,000 linear feet of additional piping (12- and 16-inch-diameter pipes). Similar to the potable water distribution piping, reclaimed water lines would, to the extent feasible given the need to irrigate certain areas, be located within road rights-of-way, utility corridors, and disturbed areas.

Up to five lift stations would be required to move wastewater to the WWTP. Lift stations would be located on the marina, at the marina parking area, near the marina launch ramp, near the campground entry, and near the campground store and gas station. In addition, up to 22,000 linear feet of force and gravity sewer main (4- and 8-inch-diameter pipes) would be required.

Similar to the potable water distribution piping, sewer lines would be located within road rights-of-way, utility corridors, and disturbed areas.

Solid Waste Disposal

Solid waste generated at Antelope Point would be collected by a contractor on a regular schedule and transported to an approved solid waste disposal site in accordance with Navajo Nation, U.S. EPA, and State regulations. Initial estimates indicate that the marina, campground, hotel and cultural center, and employee housing would generate about 5 tons of solid waste per week, requiring one-to-two waste collection/hauling trucks to visit Antelope Point weekly. Final estimates of the volume of waste needing disposal will be generated during facility design.

Dry Utilities

Dry utilities would include electricity and telephone services. No natural gas lines would be installed. All dry utilities would be placed underground within the site, to the extent feasible and practical, and would be located in road rights-of-way, existing utility corridors, and disturbed areas.

Electrical power would be obtained through the Navajo Tribal Utility Authority. Specific quantities needed for the proposed development will be determined during comprehensive facility design.

Roads

Antelope Point would continue to be accessed by the existing road (a Bureau of Indian Affairs [BIA] road) that connects from Highway 98, near the Navajo Generating Station, to the site boundary. The road would be two lanes and between 25 and 30 feet wide. The dirt road to the existing gravel pit area would be paved to provide access to the proposed hotel and cultural center. The single major road addition would turn off to the east from the main entry road and would provide access to the Marina Village parking area.

Trail System

Multiple trails would be developed throughout the site to provide access among facilities. The trails would include paved and unpaved areas. Between 2.5 and 4 miles of trails would accommodate pedestrian and bicycle uses; no equestrian uses would be permitted.

Internet Access

Internet access would be available through a standards-based wireless local area network infrastructure (WLAN). Instead of using twisted pairs of fiber-optic cable, WLANs use radio frequencies. A series of WLAN access points would provide access to the Internet anywhere within the Marina Village. Laptops or desktops anywhere within the range of overlapping access points would have high-speed access to the Internet.

2.3 ALTERNATIVE C (PREFERRED)

The Navajo Nation and Glen Canyon NRA have modified several aspects of Alternative B to develop Alternative C, the Preferred Alternative. Alternative C, similar to Alternative B, would include a marina village, dry storage area, campground and RV park, resort hotel, employee housing, and supporting infrastructure. Similar to Alternative B, construction, operation, and maintenance of Alternative C would follow the guidelines established in the Draft Environmental Management Plan (URS 2001). The most notable difference between Alternatives B and C is the treatment and disposal of wastewater. Alternative C would involve trucking wastewater to the WWTP at Page, Arizona, rather than treating it at a WWTP constructed about 1 mile southeast of the Project site, as proposed under Alternative B. This difference, as well as other differences between Alternatives B and C, are described below. The conceptual plan for facilities proposed under Alternative C is shown on Figure 2-3.

2.3.1 Marina

The facilities and services available at the Marina Village and docks under Alternative C would be similar to those described under Alternative B, with modifications to both the Marina Village central platform and buildings and the marina docks specified below.

Marina Village Central Platform and Buildings

The floating marina platform would have the same configuration as described under Alternative B (Section 2.2.1). Alternative C would not include a central pond, kiddie pool, or spa, as in Alternative B, but would allow for a water feature, such as a fountain.

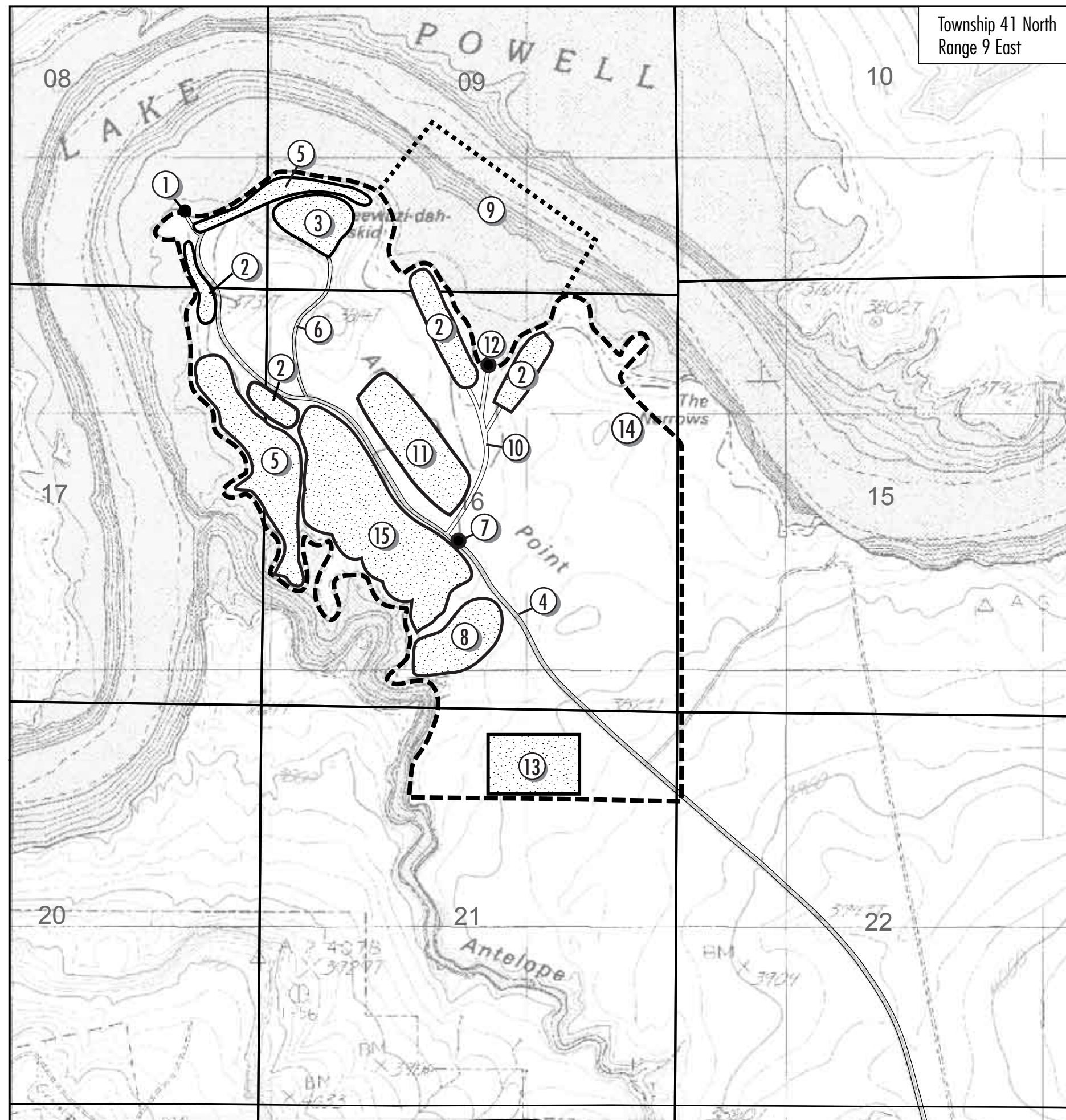
Marina Docks

Similar to Alternative B, the docks north and south of the central marina platform would be public and private docks, respectively. The private dock would include rows of private rental slips with a configuration occupying approximately 6,200 square feet, and the public dock would include slips with a configuration occupying approximately 3,400 square feet.

With respect to the private dock, access and walkways would be the same as described under Alternative B. All finger piers would be 4 feet wide; however, ADA-compliant access and slips will be provided per applicable laws at the time of construction. Ten percent of the facility must be designed for accessibility. In contrast to Alternative B, no patios would be developed at individual slips. There would be slips off each side of the main spine, with 250 to 300 slips. The configuration of the marina docks would be adjustable to accommodate changing lake levels.

The public dock would have fewer total slips than described for Alternative B, with up to 120 slips (rather than 170 slips). Similar to Alternative B, the public docks would include a fishing dock, fuel dock, boat rental docks, sewage pump-outs, and courtesy slips for the marina store. The boat rental docks would include a total of 120 slips (60 to 100 slips for houseboats and 60 to 70 slips for powerboats). There also would be 12 administrative slips (which includes Navajo Nation and National Park Service slips) and 10 commercial operator slips in this area, and an additional 2 slips for tour boats. Lighting would be provided at each slip pedestal.

Alternative C Preferred Alternative

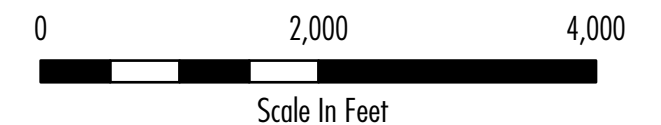


LEGEND:

- Antelope Point Project Site Boundary*
- Marina Location Boundary
- Section Lines
- ① Public Launch Ramp
- ② Public Parking
- ③ Resort Hotel and Cultural Center
- ④ Main Entry Road (paved)
- ⑤ Day Use Area (with toilet facilities)
- ⑥ Hotel Access Road (paved)
- ⑦ Fee Station
- ⑧ Optional Employee Housing
- ⑨ Marina Village and Docks
- ⑩ Marina Access Road (paved)
- ⑪ Dry Storage, Maintenance Facilities, and Campground Store
- ⑫ Marina Boat Launch Ramp
- ⑬ Wastewater Treatment Plant
- ⑭ Potable Water Storage
- ⑮ Campground and RV Park

*The Project Site includes lands of the Navajo Nation and Glen Canyon NRA.


Note: Alternatives B and C are similar except for the WWTP and potable water storage. Refer to Table 2-2 for additional differences between the alternatives.



Sources:
USGS 7.5-Minute Quadrangle for Page, AZ, 1985.
Antelope Point DCP/EA 1986.
GMF 2001.
BRW 2001.

Figure 2-3

Conceptual Facilities Footprint* Alternatives B and C

 50-foot construction limits

Preliminary footprint of building and roads.
(Placement of utilities would be in the road shoulder).

* This figure was presented by Antelope Holdings in their proposal (Alternative B) outlining the general location of proposed facilities. The location of facilities in both Alternatives B and C are almost identical, with the exception of the location of the WWTP (13) and potable water storage (14) facilities. The primary difference between Alternatives B and C are the location of the WWTP and potable water facilities; modifications to the dry storage area; the marina dock configuration; and several other site-specific modifications that are outlined in Table 2-2.

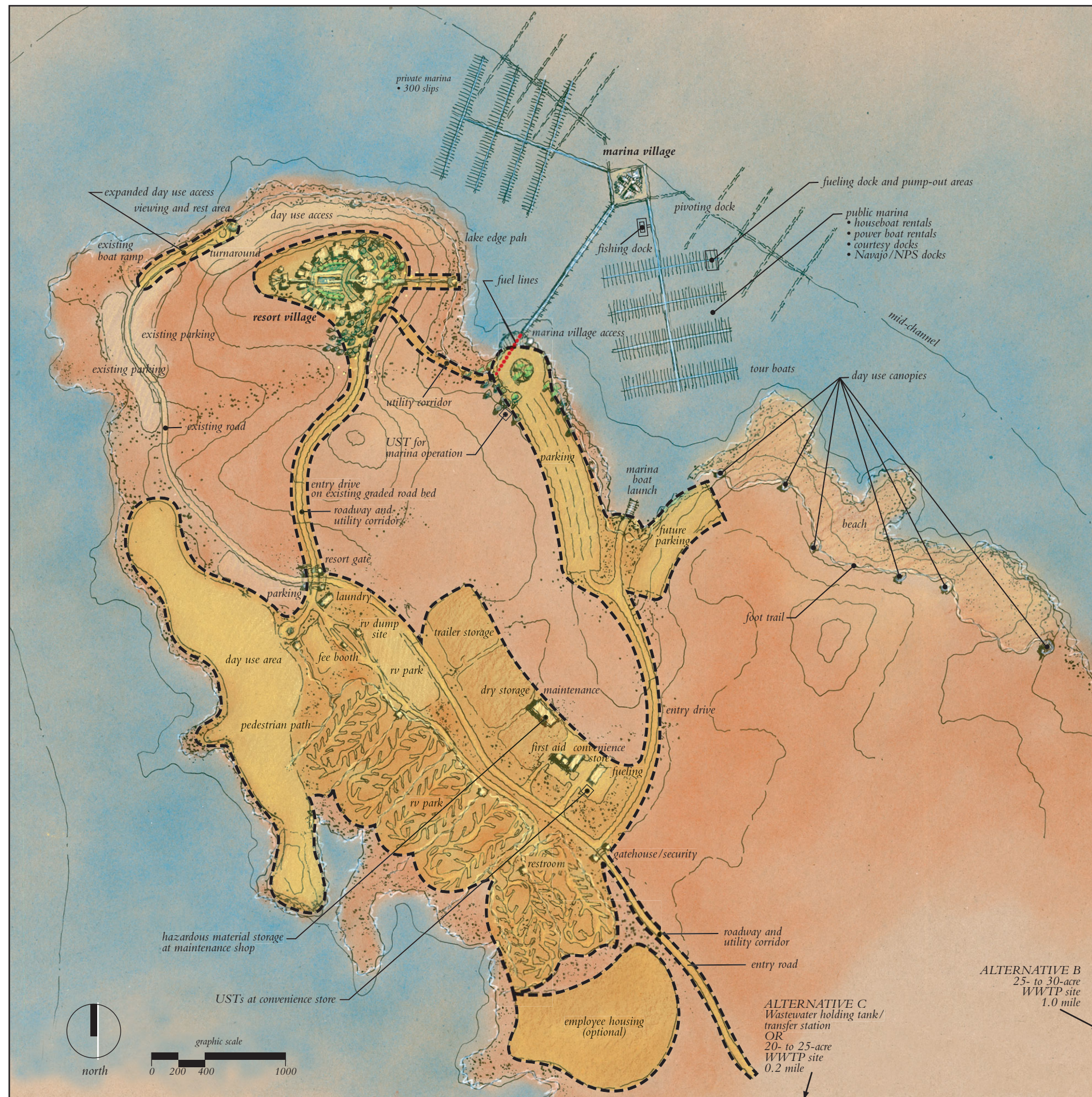


Figure 2-4

A fuel dock would be located on the lakeside end of the first row of boat rental docks, comprising individual slips for fueling a mix of 12 powerboats and houseboats. The fuel dock area would be covered to reduce heat and sunlight in the fueling area. The floating, covered fuel dock would be designed and operated the same as described for Alternative B.

Sewage pump-out services (six pumps) would be available to the public at the fuel dock at no charge. Specifications of the pump-outs would be the same as that described under Alternative B. All sewage pumped out at the fuel dock would be pumped onto a lift station located near the marina parking area. Wastewater would be stored in a tank within the Project site for truck pick-up and transported to the WWTP at Page, Arizona for treatment and disposal (described under Section 2.3.6, Supporting Infrastructure).

Marina Boat Launch Ramp and Parking Areas

The marina boat launch ramp and parking areas would be the same as those described for Alternative B.

2.3.2 Dry Storage, Maintenance Facilities, and Campground Store

The dry storage area for boats, maintenance facilities, public safety building, and campground store would occupy a total of 38 acres. These facilities would be located near the intersection of the main entry road and the marina access road. The maintenance building would be located within the dry storage area. The public safety building and campground store would be located adjacent and to the southeast of the dry storage area.

Dry Storage and Maintenance Facility

The dry storage area would occupy up to 25 of the 38 acres and would accommodate up to 500 boats, depending upon boat sizes. The area would be paved with blacktop and fenced with 7-foot-high, “square-barred” wrought-iron fencing. To improve security, lighting (down-cast and installed on poles a maximum height of 8 feet to avoid night sky light pollution) and observation cameras would be installed. The dry storage area would be set back about 200 feet from the main entry road. Landscaping and/or berming also would be used to screen the dry storage area from views along the entry road.

Alternative C would include a small building or group of buildings adjacent to the dry storage area to provide minor boat repair services, facility maintenance, and storage for small quantities of hazardous materials (e.g., lubricants, pesticides/herbicides, used motor oils). Based on an estimation of the amount of hazardous waste that would be generated at Antelope Point (less than 220 pounds per month), the Project would be classified as a conditionally exempt small-quantity generator under federal laws and regulations.

Campground Store and Public Safety Building

The campground store and public safety building would occupy approximately 5 of the 38 total acres. Similar to Alternative B, the general store would serve the campground and RV park immediately across the main entry road and would include self-service gasoline pumps. In

addition to Alternative B, a crosswalk painted on the road and roadway signage would provide safe pedestrian and bicycle access between the general store and the campground. The public safety building, which was not proposed under Alternative B, would include a bay for a fire truck and/or ambulance, and would be administered cooperatively by the Navajo Nation and National Park Service.

2.3.3 Campground and Associated Facilities

The campground and RV park would occupy approximately 70 acres and would include up to 150 sites to accommodate RV and tent sites. Permanent structures associated with the campground facilities would be located above 3,711 feet, the lower elevation limit where permanent facilities may be placed within Glen Canyon NRA.

Wastewater from the RV dump station, restrooms, showers, and laundromat would be collected in a holding tank and hauled by truck to the WWTP at Page, Arizona for treatment and disposal.

2.3.4 Resort Hotel and Cultural Center

The hotel and cultural center would be the same as described for Alternative B, with one exception. All linen and laundry services, except coin-operated machines, would be located off site (outside the Antelope Point Project area).

2.3.5 Employee Housing

Employee housing and associated parking areas would be developed if available regional housing is not sufficient to meet the needs of the Project. Employee housing would be located south of the proposed campground on approximately 5 acres and would provide housing for approximately 98 individuals. Employee housing would include four dormitory-type buildings with 10 two-bedroom units each. Additionally, six units with three bedrooms would be included. All buildings would be limited to two stories.

2.3.6 Supporting Infrastructure

Potable Water System

The water system would provide potable water to all buildings and facilities at Antelope Point. Water demand for the Marina Village facilities, resort and cultural center, campground and RV park, and employee housing would be, on average, 53,000 gpd, with a maximum peak hourly demand of 125 gpm (not including fire protection events). The optional employee housing would account for approximately 12,000 gpd of the total demand. The water supply would come from one of the existing on-site wells; the Navajo Nation would provide potable water (based on U.S. EPA standards) to the Project. Testing indicates that this well can provide about 300 to 400 gpm (Foley 2001). The water system also would provide water needed for fire protection and irrigation. One 300,000- to 350,000-gallon water storage tank and one 5,000-gallon hydro-pneumatic tank, located east of the main entry road and development area on a small knoll, and would provide the needed water storage for both the facilities and fire protection events. This location is near the well that would be used to supply potable water. Up to 37,000 linear feet of

water lines (6- and 8-inch-diameter pipes) would be required for distribution of potable water from tanks to facilities. Water lines would be located in road rights-of-way, utility corridors, and disturbed areas. An in-line chlorinating system, and point-of-use arsenic treatment or water mixing, would likely be used to ensure water meets EPA standards.

Wastewater Management

The marina, campground, hotel, and associated facilities would be expected to generate an average of 53,000 gallons of wastewater daily. If the optional employee housing were developed, it would generate an additional 12,000 gpd, on average.

The preferred option for handling wastewater, which would be implemented if employee housing was not developed, would be to collect wastewater, pipe it to a single location, and truck it to a WWTP in Page, Arizona for treatment and disposal (the Page WWTP has the capacity to treat wastewater at a rate of 2 million gpd). The single wastewater collection point likely would be located just inside the site boundary along the main entry road. A below-grade, on-site tank would be used for wastewater storage within this pick-up area. Based on the amount of wastewater generated, and assuming a 7,000-gallon truck capacity (the maximum size that would meet Arizona Department of Transportation [ADOT] weight restrictions), an average of eight trucks per day would be needed to haul wastewater to Page, Arizona for treatment and disposal. The storage tank would be sized to provide a minimum of two days of emergency storage. Based on the amount of wastewater generated and the surplus tank storage capacity, only a minimal increase in the number of trucks transporting waste daily would be expected during the peak summer season.

A secondary option, which would be implemented if the WWTP at Page, Arizona could not accept wastewater from Antelope Point, or if employee housing was developed, would be to locate a WWTP within the Antelope Point area. The WWTP would be located in Section 21, Township 41 North, Range 9 East, just west of the Antelope Point main entry road (BRW 2001). This would include only secondary treatment of wastewater, which would require a 200,000-gallon treatment lagoon and two 180,000-square-foot evaporation ponds. The facility would occupy approximately 20 to 25 acres. Over 20 years the costs of construction, operation, and maintenance of a WWTP would be \$8 million (about \$6 million for construction, \$180,000 annually for operation and maintenance). Treated effluent would not be used for irrigation or fire protection.

For either trucking wastewater or using a WWTP for wastewater generated at Antelope Point, up to five lift stations would be required to move wastewater to a main collection location. In addition, a force and gravity sewer main (4- and 8-inch-diameter pipes) would be required; however, the linear feet of line would be substantially less than those described for Alternative B. Sewer lines, to the extent they are needed, would be located within road rights-of-way, utility corridors, and disturbed areas.

Solid Waste Disposal

Solid waste management at Antelope Point would be the same for Alternative C as described for Alternative B, including Antelope Holdings' commitment to reduce waste generation (see Section 2.8).

Dry Utilities

Dry utilities at Antelope Point would be the same for Alternative C as described for Alternative B.

Roads

Access at Antelope Point would be the same for Alternative C as described for Alternative B.

Trail System

The trail system at Antelope Point would be the same for Alternative C as described for Alternative B.

Internet Access

Internet access at Antelope Point would be the same for Alternative C as described for Alternative B.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED

2.4.1 Alternative Economic Development Strategies for the Navajo Nation

One comment received during public scoping suggested that this EA should analyze alternative economic development strategies available to the Navajo Nation. Other than constructing a resort and marina at Antelope Point, the question of the potential for the Navajo Nation to acquire management and operation of the Wahweap marina or to develop alternative land uses at Antelope Point, such as health care facilities, was raised. The Antelope Point Marina and Resort Development would be located on Navajo Nation land, unlike Wahweap, which is located in the Glen Canyon NRA on federal land administered by the National Park Service. Acquisition and operation of the Wahweap concession contract is not a viable economic development alternative for the Navajo Nation. Further, the 1970 MOA among the Navajo Nation, National Park Service, BIA, and BOR specifically recognizes that in transferring lands to the United States (now contained in the Glen Canyon NRA), that were previously within the boundaries of the Navajo Reservation, the Navajo Nation retained certain rights to those transferred lands. These rights include the ability to realize the economic benefits of tourism-related development of these lands. The Antelope Point site is part of transferred lands. Its proposed use is consistent with long-standing planned land uses and is consistent with the Glen Canyon NRA General Management Plan (GMP). Development of alternative land uses, such as health care facilities, would not meet the purpose and need of the Project to cooperatively manage the shoreline areas of Lake Powell consistent with the Navajo Nation's desire to develop these areas for recreational

use. Therefore, alternative land uses, other than developments serving recreational purposes, were not considered in this EA.

2.4.2 Construction of a Pipeline for Wastewater Disposal

In addition to the proposal to construct a WWTP at Antelope Point and the proposal to truck wastewater to Page, Arizona for treatment and disposal, the Navajo Nation and National Park Service considered developing a pipeline to pump wastewater directly from Antelope Point to an existing WWTP at Page, Arizona. Although the pipeline could be located primarily within existing utility corridors along roads and highways, traffic delays during pipeline construction could occur. Disturbance along approximately 7 miles of roadway would occur, with 2.5 miles occurring along Highway 98. Construction of the pipeline would require an area approximately 50 feet wide (5-foot trench, 20 feet for spoils, and 20 to 30 feet for access around construction equipment), resulting in disturbance of more than 40 acres. Construction-generated impacts on air quality, cultural resources, public safety, and transportation and traffic would be greater than those occurring under Alternatives B or C. Further, a pipeline alternative for disposing of wastewater would require development outside of the area designated for development and defined in the 1986 Development Concept Plan/Environmental Assessment (DCP/EA). The National Park Service requested that all development be within this area to ensure compliance with previous cultural resource and threatened and endangered species consultations with the State Historic Preservation Office (SHPO) and U.S. Fish and Wildlife Service (FWS), respectively. Assuming that the pipeline would not require excavation and reconstruction of the road, construction of the pipeline would be anticipated to cost approximately \$5.3 million; additional minor costs for operation and maintenance would accrue annually. Despite the feasibility of developing a pipeline based on costs, the pipeline would not be located within the previously defined project boundaries. Therefore, installation of a wastewater pipeline from Antelope Point to Page is dismissed from further consideration.

2.5 ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

The No Action Alternative (Alternative A) represents the current status of the Antelope Point site. Existing use and development at Antelope Point is based on planning in the GMP. Camping and occasional off-highway vehicle (OHV) use are practiced at Antelope Point, and the site is without active park patrols or interpretation. These activities contribute to site degradation, as does the litter strewn around the site, which is accelerated as a result of the lack of law enforcement and other public safety personnel and facilities there. The main entry road has been improved, but only primitive facilities (e.g., vaulted toilets, one information shelter, two courtesy docks) are available to Antelope Point visitors. The gravel pit area, which is a scar to the landscape, would not be reclaimed and developed, as proposed under Alternatives B and C. Visitor opportunities would not be as diverse as under Alternatives B and C. The No Action Alternative does not fully realize goals 2 through 6 listed above.

Alternative B provides more diverse opportunities for leisure and recreational activities for visitors of Antelope Point. Project facilities and services would include, though not be limited to, houseboat and powerboat rentals, restaurants, cultural events (e.g., artisan shops, concerts in the cultural center), a campground, and hiking trails. The location of the dry storage area closer to the road in Alternative B than in Alternative C would detract from the aesthetics at the site. Alternative B would allow for pools and spas in the Marina Village and a WWTP off site, all of which would increase risks to water quality. The off-site WWTP also could affect unknown sensitive cultural resources. Based on aesthetic effects and potentially adverse impacts on water quality and cultural resources, Alternative B would not fully realize goals 2 through 4.

Alternative C would provide diverse visitor experience opportunities, with fewer potential adverse impacts than Alternative B. Without pools and spas located in the Marina Village, and by using trucking to dispose of wastewater in Page, Arizona, goals 2 through 4 would be met. If employee housing was needed and developed, creating the demand for an on-site WWTP, Alternative B would only partially realize goals 2 and 3, due to the aesthetic impact of the WWTP and potential impacts on water quality. Compared to Alternatives A and B, Alternative C would provide the greatest protection to the visitor experience, natural resources, and cultural resources.

After careful review of potential resource and visitor impacts, and developing mitigation measures for impacts on natural and cultural resources, the environmentally preferred alternative is Alternative C. Alternative C would surpass the other alternatives in meeting the full range of national environmental policy goals as stated in Section 101 of NEPA. Although the No Action Alternative may achieve greater levels of individual protection for cultural resources or natural

resources, or better enhance visitor experience, Alternative C overall would (1) provide a high level of protection of natural and cultural resources, while concurrently attaining the widest range of neutral and beneficial uses of the environment without degradation; (2) maintain an environment that supports diversity and variety of individual choice; and (3) integrate resource protection with an appropriate range of visitor use.

Table 2-1 outlines how each alternative meets the Project objectives (described in Section 1.5).

TABLE 2-1 COMPARISON OF PROJECT OBJECTIVES AND PROVISIONS OF EACH ALTERNATIVE			
Objective	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Provide additional recreation opportunities and access, consistent with the Antelope Point DCP/EA, which satisfy the needs of the visiting public and support the preservation of Lake Powell and the Antelope Point Project site for future generations.	Allow continued use of Antelope Point for parking, boat launching, and camping. Sporadic illegal OHV use continues. <i>Does not meet Project objectives.</i>	Develop and operate marina facilities and services, resort hotel and cultural center, campground and RV park, and associated facilities. Development includes an off-site WWTP, pool and spa in the Marina Village, minimal setback of dry storage area from the entry road. <i>Partially meets Project objectives.</i>	Develop and operate marina facilities and services, resort hotel and cultural center, campground and RV park, and associated facilities. Development includes trucking wastewater to Page, Arizona for treatment and disposal and a 200-foot setback of the dry storage area from the entry road. Develop on-site WWTP only if employee housing is needed. <i>Meets Project objectives.</i>
Provide the people of the Navajo Nation with an opportunity for sustainable economic development of their lands, tourism resources, and local enterprises.	Retain existing fee station operation. <i>Does not meet Project objectives.</i>	Lease land at Antelope Point to Antelope Holdings for development and operation of Project. <i>Meets Project objectives.</i>	Same as Alternative B. <i>Meets Project objectives.</i>
Provide the visiting public with a quality commercial operation that provides exceptional services at rates that are fair and consistent with the cost and quality of the offering.	Retain existing primitive facilities; no commercial services offered. <i>Does not meet Project objectives.</i>	Develop and operate marina facilities and services, resort hotel and cultural center, campground and RV park, and associated facilities. <i>Meets Project objectives.</i>	Same as Alternative B. <i>Meets Project objectives.</i>

2.6 COMPARISON OF ALTERNATIVES

Table 2-2 summarizes the components of each of the alternatives. Table 2-3 summarizes and compares the potential environmental consequences associated with each alternative. The results of the impact analysis and definitions/explanations of impact levels are provided in Chapter 4.

TABLE 2-2 COMPARISON OF ALTERNATIVES			
Development Component	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Marina	<ul style="list-style-type: none"> No Marina Village Two breakwaters (200 feet each). Public launch ramp with two courtesy docks with walkways. 	<ul style="list-style-type: none"> Marina Village – approximately 0.5-acre central floating platform with four buildings (marina store, full-service restaurant, management and client service offices, and first aid center), central pond, kiddie pool, and spa. Accessed by 12-foot-wide walkway from shore to village. Pivoting private dock south of the central marine platform with four rows of private rental slips, totaling 300, each with water width of 22 feet and having a 15-foot-wide patio and lighting, accessed from the main 12-foot-wide walkway by a smaller, 10-foot-wide dock walkway. All piers would be 4 feet wide. Eight private toilet/shower rooms (two per row of slips) and one coin-operated laundry facility. Initially 10 to 20 percent of slips would be covered. Pivoting public dock north of the central marina platform with four rows of lighted slips, including 170 public slips (100 rental slips for houseboats and 70 rental slips for power boats), a fishing dock, fuel dock, boat rental docks, sewage pump-outs, and courtesy slips (6 for Navajo Nation, 10 commercial, 3 for tour boats). Floating, covered fuel dock for 12 boats; fuel tanks located on land in underground storage tank adjacent to marina parking; flexible piping. Sewage pump-out services (six pumps) available to public at fuel dock for a fee; sewage pumped to lift station and from there to on-site WWTP. Mobile, floating sewage pump-out unit with 500-gallon capacity dockside. 	<ul style="list-style-type: none"> Same as Alternative B except no central pond, kiddie pool, or spa, but would allow for a water feature. Same approximate square footage as Alternative B with private rental slips (250 to 300) using a combination of breakwaters and wakeless zones. Slips would have no patios. ADA-accessible facilities would be provided as required. Same approximate square footage as Alternative B, but only 120 slips (60 to 100 rental slips for houseboats and 60 to 70 rental slips for small boats/power boats). Courtesy slips would include 12 administrative slips (includes Navajo Nation and National Park Service slips), 10 commercial slips, and an additional 2 slips for tour boats. The configuration could be adjusted to accommodate changing lake levels. Same as Alternative B. Same as Alternative B except sewage would be stored on site and transported to Page, Arizona for treatment and disposal, and there would be no charge for pump-out service. Same as Alternative B.

TABLE 2-2 COMPARISON OF ALTERNATIVES			
Development Component	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
	<ul style="list-style-type: none"> Parking for 383 vehicles. 	<ul style="list-style-type: none"> Second launch ramp located along shore, just south of Marina Village with 5-acre, 400-space parking area and landscaped areas. A combination of breakwaters and wakeless areas, if needed. 	<ul style="list-style-type: none"> Same as Alternative B. A wakeless area would be designated. Breakwaters would be implemented, if needed.
Dry Storage, Maintenance Facilities, and Campground Store	<ul style="list-style-type: none"> No dry storage area or campground store; maintenance of existing facilities. 	<ul style="list-style-type: none"> Dry storage area, maintenance facilities, and campground store occupying 20 acres. Paved, lighted, and covered dry storage area occupying up to 12 acres, accommodating up to 500 boats, set back 24 to 40 feet from main road. Small building or group of buildings adjacent to storage area for minor boat repair services, facility maintenance, and storage for small quantities of hazardous materials. Campground store occupying approximately 5 acres. Native vegetation landscaping to screen views of storage area. 	<ul style="list-style-type: none"> Dry storage area, maintenance facilities, public safety building, and campground store occupying 38 acres. Paved, lighted, and covered dry storage area occupying up to 25 acres, accommodating up to 500 boats, set back approximately 200 feet from main road. Same as Alternative B. Campground store and public safety building occupying approximately 5 acres. Native vegetation landscaping and berming to screen views of storage area.
Campground and Associated Facilities	<ul style="list-style-type: none"> No campground or RV park, but one information shelter and one fee station. 	<ul style="list-style-type: none"> Campground and RV park occupying approximately 70 acres with permanent structures located above 3,711 feet. 150 RV sites in five loops of 30 sites each and 50 tent sites in two loops of 25 sites each, an entry station, laundrymat and shower facility, and day-use picnic facilities. Sewer dump station with wastewater delivered to on-site WWTP. 	<ul style="list-style-type: none"> Same as Alternative B. Up to 150 sites, including a combination of RV and tent sites. Sewer dump station with wastewater pumped to collection location for delivery to WWTP in Page, Arizona.

TABLE 2-2 COMPARISON OF ALTERNATIVES			
Development Component	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Resort Hotel and Cultural Center	<ul style="list-style-type: none"> No hotel or cultural center 	<ul style="list-style-type: none"> Hotel located on approximately 10 acres in a previously disturbed gravel pit with up to 225 rooms, a 200-seat full-service restaurant, on- or off-site laundry services, a snack bar, a small gift and sundry shop, tennis courts, and a cultural center complex with artist studios and an amphitheater. Up to 4 acres of parking area with landscaping for up to 250 cars for the hotel and 150 for the cultural center (including RV/bus parking), totaling 400. 	<ul style="list-style-type: none"> Same as Alternative B except all linen and laundry services, except coin-operated machines, would be located off site. Same as Alternative B.
Employee Housing	<ul style="list-style-type: none"> No employee housing 	<ul style="list-style-type: none"> Option to develop employee housing if needed for the Project. 	<ul style="list-style-type: none"> Option to locate four dormitory-type buildings with 10 two-bedroom units each on 5 acres immediately south of campground, including parking, to house approximately 98 individuals. An additional six three-bedroom units would be included. All buildings would be two stories tall.
Supporting Infrastructure <i>Potable water system</i>	<ul style="list-style-type: none"> No potable water 	<ul style="list-style-type: none"> Potable water system supplying an average demand of 70,000 gpd (optional employee housing would demand additional water), with maximum peak hourly demand of 194 gpm, not including fire flows. Water supplied from one or two existing on-site wells capable of pumping 125 gpm each. Three 75,000-gallon storage tanks (one occurring during Phase 2) and one 5,000-gallon hydro-pneumatic tank located off site near WWTP. Fire protection would be treated effluent. 15,000 lineal feet of 6-inch "backbone" lines to interconnect wells with elevated tanks, 22,200 lineal feet of 8-inch backbone lines for water distribution (2,200 feet of total occurring in Phase 2), and 1,500 lineal feet of 2-inch line extension. 	<ul style="list-style-type: none"> Potable water system supplying an average demand of 53,000 gpd (optional employee housing would account for approximately 12,000 gpd), with maximum peak hourly demand of 125 gpm, not including fire flows. Water supplied from one existing on-site well capable of pumping 300 to 400 gpm. One 300,000- to 350,000-gallon storage tank and one 5,000 gallon hydro-pneumatic tank near potable water well for facilities and fire protection. Same or less piping as Alternative B.
<i>Non-potable water services</i>	<ul style="list-style-type: none"> No non-potable water services 	<ul style="list-style-type: none"> 10,000 lineal feet of 16-inch gravity feed backbone line, 7,000 lineal feet of 12-inch fire protection line, reclaimed water for irrigation and fire protection; dual piping required. 	<ul style="list-style-type: none"> No non-potable water; landscaping and fire protection rely on potable supply.

TABLE 2-2 COMPARISON OF ALTERNATIVES			
Development Component	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
<i>Wastewater management</i>	<ul style="list-style-type: none"> Two vaulted toilets; waste collected twice annually. One portable toilet dump station. Four movable microflush toilets (at two stations); pumped out weekly. 	<ul style="list-style-type: none"> Enclosed 150,000 gpd capacity WWTP developed on 25 to 30 acres, approximately 2 miles southeast of Antelope Point development area, outside the Project area. WWTP would include 200,000-gallon treatment lagoon, tertiary treatment facility, 300,000-gallon storage tank (for treated effluent for fire events), and two 180,000-square-foot evaporation ponds for surplus effluent. 8,000 lineal feet of 8-inch gravity sewer main, 6,800 lineal feet of 4-inch force main (2,800 feet of total occurring in Phase 2), 7,000 lineal feet of double 8-inch force main, and up to five lift stations (one on marina platform, one included in Phase 2). 	<ul style="list-style-type: none"> If employee housing is not developed, wastewater would be pumped to one location, collected by trucks, and transported to Page, Arizona WWTP in an average of eight truckloads per day. Up to five lift stations; substantially less piping than Alternative B. If the Page WWTP cannot accept wastewater from Antelope Point or employee housing is developed, a WWTP (same dimensions as Alternative B, but with three 170,000-gallon tanks for wastewater storage) would be located within the Antelope Point area.
<i>Solid waste disposal</i>	<ul style="list-style-type: none"> Collection daily in summer and weekly in winter. 	<ul style="list-style-type: none"> Waste (average of 5 tons weekly) hauled by contractor, requiring one to two trucks per week. Composting of wet wastes from restaurants, WWTP, and landscaping. 	<ul style="list-style-type: none"> Same as Alternative B (composting only if feasible). Recycling will be required.
<i>Dry utilities</i>	<ul style="list-style-type: none"> 3 miles of post and cable; three solar street lights. 	<ul style="list-style-type: none"> Underground electrical and telephone lines along roadways, disturbed areas, and some open space areas; no natural gas. 	<ul style="list-style-type: none"> Same as Alternative B.
<i>Roads</i>	<ul style="list-style-type: none"> Existing paved access road to public launch ramp. Gravel pit access road (unmaintained). 	<ul style="list-style-type: none"> Existing paved access road to public launch ramp; road to existing gravel pit site would be paved for access to hotel and cultural center. Single major road addition would turn off to east of main entry road and provide access to Marina Village parking area. 	<ul style="list-style-type: none"> Same as Alternative B.
<i>Trail system</i>	<ul style="list-style-type: none"> No trail system; unregulated use throughout area. 	<ul style="list-style-type: none"> 2.5 to 4.0 miles of paved and unpaved trails to accommodate pedestrian and bicycle uses (no equestrian uses). 	<ul style="list-style-type: none"> Same as Alternative B.
<i>Internet access</i>	<ul style="list-style-type: none"> No Internet access. 	<ul style="list-style-type: none"> Wireless local area network. 	<ul style="list-style-type: none"> Same as Alternative B.

TABLE 2-3 SUMMARY OF ENVIRONMENTAL CONSEQUENCES			
Impact Topic	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Air Quality	Alternative A would create long-term, negligible, adverse impacts on air quality from continued recreational uses, including emissions from cars, campers, and boats.	Alternative B would create both short-term and long-term, negligible-to-minor, adverse impacts on air quality, from construction dust and gaseous emissions, increased recreational use of the area, and operation of the WWTP.	Alternative C would create both short-term and long-term, negligible-to-minor, adverse impacts on air quality, similar to Alternative B, but with more effects from wastewater trucks and less from wastewater lagoons.
Geology and Soils	Alternative A would result in long-term, negligible-to-minor, adverse impacts on geology and soil resources due to the continued surface disturbance from use of the area by campers and vehicles.	Alternative B would result in both short-term and long-term, minor, adverse impacts on geology and soil resources, due to the disturbance from construction activities and the long-term use of the area by visitors and vehicles, plus the permanent loss of a small amount of productive soil resources for paved areas and buildings.	Alternative C would result in short-term and long-term, minor, adverse impacts on geology and soil resources, due to the disturbance from construction activities and the long-term use of the area by visitors and vehicles, plus the permanent loss of a small amount of productive soil resources for paved areas and buildings.
Water Resources	Alternative A would result in long-term, negligible, adverse impacts on surface water quality because of continued camping and use of watercraft near Antelope Point. No impacts on groundwater would be anticipated.	Alternative B would result in short-term, negligible, adverse impacts on surface water quality from runoff during construction. Long-term, negligible-to-minor, adverse impacts on surface water quality would occur from potential leaks in fuel tanks and wastewater lagoons and from the additional boat use expected. However, beneficial, long-term, minor impacts would occur from installation of toilets and curtailment waste along the shoreline that contaminates surface water.	Alternative C would result in short-term, negligible, adverse impacts on surface water quality from runoff during construction. Long-term, negligible-to-minor, adverse impacts on surface water quality would occur from potential leaks in fuel and wastewater containment structures and additional boat use. However, beneficial, long-term, minor impacts would occur from installation of toilets, curtailment waste along the shoreline that contaminates surface water.
Vegetation	Impacts on vegetation from the implementation of this alternative would be long term, negligible to minor, and adverse because of continued recreational uses.	Impacts on groundwater quantities would be long term, negligible to minor, and adverse based on the ability of the on-site wells to provide the water needed for the Project. Impacts on groundwater quality would be long term, minor, and adverse based on the risk of contamination from leaking wastewater lagoons and fuel storage tanks.	Impacts on groundwater quantities would be long term, negligible to minor, and adverse based on the ability of the on-site wells to provide the water needed for the Project. Impacts on groundwater quality would be long term, minor, and adverse based on the risk of contamination from leaking wastewater containment structures and fuel storage tanks.

<p>TABLE 2-3 SUMMARY OF ENVIRONMENTAL CONSEQUENCES</p>			
Impact Topic	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Wildlife and Wildlife Habitat	Impacts resulting from implementation of Alternative A would be long term, negligible, and adverse from the continued, but limited recreational uses at Antelope Point.	Impacts resulting from implementation of Alternative B would be negligible to minor, and adverse from increased disturbance and presences of facilities and additional visitors at Antelope Point.	Impacts resulting from implementation of Alternative C would be negligible to minor, and adverse from increased disturbance and presences of facilities and additional visitors at Antelope Point.
Special Status Species	Impacts on special status species would be long term, negligible, and adverse because of continued disturbance and degradation at Antelope Point from campers, boaters, and occasional OHV use. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity.	Construction-generated impacts on special-status species from Alternative B would be short term, negligible, and adverse because of the noise, dust, and disturbance generated from equipment and ground-clearing activities. Operational impacts on special-status species would be long term, negligible, and adverse from an increased number of visitors using vehicles and watercraft in the area, and from potential vegetation trampling. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity.	Construction-generated impacts on special-status species from Alternative C would be short term negligible, and adverse because of the noise, dust, and disturbance generated from equipment and ground-clearing activities. Operational impacts on special-status species would be long term, negligible, and adverse from an increased number of visitors using vehicles and watercraft in the area, and from potential vegetation trampling. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity.
Cultural Resources	Impacts on archeological resources would be long term, negligible to minor, but adverse from uses that would continue to occur at Antelope Point.	If Alternative B were selected, additional cultural resource surveys would have to be conducted. Although one or more archeological sites might be present and could be adversely affected within the unsurveyed zones, the intensity of impacts would be minor, due to the potential for satisfactorily mitigating disturbance of such sites through avoidance and data recovery. Therefore, impacts on cultural resources would be permanent, minor, and adverse.	Alternative C would not affect any National Register-eligible properties. However, both the trucking and WWTP options would require additional cultural resource surveys. Although one or more archeological sites might be present and could be adversely affected within the unsurveyed zones, the intensity of impacts would be minor, due to the potential for satisfactorily mitigating disturbance of such sites through avoidance and data recovery. Therefore, impacts on cultural resources would be permanent, minor, and adverse.
Public Safety	Alternative A would result in long-term, negligible-to-minor, adverse impacts on public safety, as there is very limited use of the area, coupled with a lack of on-site safety response facilities or personnel.	Alternative B would result in long-term, minor to seasonally moderate, and adverse impacts on public safety, as the new development would bring relatively large numbers of people to an area with opportunities for accidents. The potential for impacts would be partially mitigated by the provision of a first aid station at the marina.	Alternative C would result in long-term, minor, and adverse impacts on public safety, as the new development would bring relatively large numbers of people to an area with numerous opportunities for accidents. The potential for impacts would be mitigated by the provision of two new designated on-site safety facilities – a first aid station at the marina, and a public safety building near the campground store.

TABLE 2-3 SUMMARY OF ENVIRONMENTAL CONSEQUENCES			
Impact Topic	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Soundscapes	Alternative A would result in long-term, negligible-to-minor, adverse impacts on the natural soundscape, due to the disturbance from long-term use of the area by visitors and vehicles.	Alternative B would add numerous non-natural sources of noise to the area that would exceed ambient levels, but these would not be expected to disrupt most visitor activities. The actions taken during construction and operation of the facilities would result in short-term and long-term, minor-to-moderate, adverse impacts on the natural soundscape. Impacts on natural soundscapes would be greatest during peak-season holiday weekends.	Alternative C would add numerous non-natural sources of noise to the area that would exceed ambient levels, but these would not be expected to disrupt most visitor activities. The actions taken during construction and operation of the facilities would result in short-term and long-term, minor-to-moderate, adverse impacts on the natural soundscape. Impacts on natural soundscapes would be greatest during peak-season holiday weekends.
Transportation and Traffic	Alternative A would result in localized, long-term, negligible, adverse impacts from visitors traveling to and within the area.	Construction activities at Antelope Point would include trucks and equipment entering the area; this traffic would be negligible when compared to visitor numbers. Increased visitors to the Antelope Point Project site would occur from operation of Alternative B, resulting in increased traffic. Impacts on transportation and traffic would be greatest during peak-season holiday weekends. Planned improvements to transportation routes and installation of appropriate traffic control devices would reduce, long-term, adverse impacts to minor-to-moderate levels.	Construction activities at Antelope Point would include trucks and equipment entering the area; this traffic would be negligible when compared to visitor numbers. Increased visitors to the Antelope Point Project site would occur from operation of Alternative C, resulting in increased traffic. Impacts on transportation and traffic would be greatest during peak-season holiday weekends. Planned improvements to transportation routes and installation of appropriate traffic control devices would reduce, long-term, adverse impacts to minor-to-moderate levels.
Visual Resources	Camping would continue to degrade the natural appearance of the area under Alternative A, and the gravel pit area would not be reclaimed, resulting in localized, long-term, negligible-to-minor, adverse impacts on visual resources.	Design of the Project with consideration of colors and the cultural setting would minimize visual intrusions, including light pollution. Construction would generate dust temporarily, creating some visual intrusion to views from Lake Powell, causing short-term, minor, and adverse impacts. Based on the visibility of the proposed facilities within the surrounding area, the design features (mitigation measures) that would be implemented, and lighting that would be added to the area, impacts on visual resources would be long term, minor to moderate and adverse.	Design of the Project with consideration of colors and the cultural setting would minimize visual intrusions, including light pollution. Construction would generate dust temporarily, creating some visual intrusion to views from Lake Powell, causing short-term, minor, and adverse impacts. Based on the visibility of the proposed facilities within the surrounding area, the design features (mitigation measures) that would be implemented (including screening of the dry storage area), and lighting that would be added to the area, impacts on visual resources would be long term, minor to moderate and adverse.

TABLE 2-3 SUMMARY OF ENVIRONMENTAL CONSEQUENCES			
Impact Topic	Alternative A (No Action)	Alternative B (Proposal)	Alternative C (Preferred)
Socioeconomics	Continued recreational uses and lack of sustainable revenue for the Navajo Nation would result in long-term, negligible-to-minor, adverse impacts on land uses, population, employment, housing, and recreation. Impacts resulting from the lack of employment opportunities and sustainable revenue for the Navajo Nation would result in long-term, minor-to-moderate, adverse impacts on a low-income and minority population (the Navajo Nation).	Land use impacts occurring from the leasing of Navajo land, effects on the water-intake facility from visitor use, and livestock displacement would be localized use, negligible, long term, and adverse. Impacts on Antelope Island from increased visitors also would be localized, minor, long term, and adverse. Impacts on population would be long term and negligible to minor. Employment generated by development of the Project would create a long-term, minor-to-moderate, beneficial impact on the area. Development of employee housing, if needed to meet Project employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region. Recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas, resulting in localized, long-term, minor-to-moderate, beneficial impacts. Impacts on low-income and minority communities (i.e., the Navajo Nation) would be primarily long term, minor to moderate, and beneficial; impacts resulting from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.	Land use impacts occurring from the leasing of Navajo land, effects on the water-intake facility from visitor use, and livestock displacement would be localized, negligible, long term, and adverse. Impacts on Antelope Island from increased visitors also would be localized, minor, long term, and adverse. Impacts on population would be long term and negligible to minor. Employment generated by development of the Project would create a long-term, minor-to-moderate, beneficial impact on the area. Development of employee housing, if needed to meet Project employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region. Recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas, resulting in localized, long-term, minor-to-moderate, beneficial impacts. Impacts on low-income and minority communities (i.e., the Navajo Nation) would be primarily long term, minor to moderate, and beneficial; impacts resulting from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.
Waste Management	Waste generation under Alternative A would involve relatively small amounts of trash and use of portable or vault toilet facilities; no energy consuming facilities would be developed. This would cause few, if any, discernable adverse effects on human health or the environment, resulting in negligible, short-term, adverse impacts.	Alternative B would involve the management of a relatively large amount of waste compared to the current use of the area. However, there would be mitigation and other standard provisions for safe and effective wastewater treatment or disposal, and solid or hazardous waste management, such that the long-term, adverse impacts related to waste management would be kept to minor levels. Energy consumption would be limited through the use of efficient designs, and other best management practices.	Alternative C would involve the management of a relatively large amount of waste compared to the current use of the area. However, there would be mitigation and other standard provisions for safe and effective wastewater treatment or disposal, and solid or hazardous waste management, such that the long-term, adverse impacts related to waste generation and energy consumption would be kept to minor levels. Energy consumption would be limited through the use of efficient designs, use of specific building materials, and other best management practices.

2.7 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES

Table 2-4 presents a summary of the regulations and policies that apply to each alternative and management of natural and cultural resources in Glen Canyon NRA.

TABLE 2-4 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES		
Resource	Desired Condition	Source
Air Quality	<ul style="list-style-type: none"> Air quality in the federal parks meets national ambient air quality standards (NAAQS) for specified pollutants. NRA activities do not contribute to deterioration in air quality. Present and future sources of air pollution on the Navajo Nation are controlled. 	<ul style="list-style-type: none"> Clean Air Act; NPS Management Policies 2001 Clean Air Act, National Ambient Air Quality Standards; NPS Management Policies 2001; Arizona Department of Environmental Quality, Air Pollution Control Requirements Navajo Nation Air Pollution Prevention and Control Act (1995); Navajo Nation Air Quality Control Program (2000)
Geology and Soils	<ul style="list-style-type: none"> Natural soil resources and geologic processes function in as natural condition as possible, except where special management considerations are allowable under policy (areas of special management considerations will be determined through management zoning decisions in the GMP). 	<ul style="list-style-type: none"> NPS Management Policies 2001
Water Resources	<ul style="list-style-type: none"> NPS will perpetuate surface waters and groundwaters as integral components of NRA aquatic and terrestrial ecosystems. NPS will determine the quality of NRA surface and groundwater resources and avoid, whenever possible, the pollution of NRA waters by human activities occurring within and outside of parks. Natural floodplain values are preserved and restored. The natural and beneficial values of wetlands are preserved and enhanced. 	<ul style="list-style-type: none"> Clean Water Act; Executive Order 11514; NPS Management Policies 2001 Clean Water Act; Executive Order 12088; NPS Management Policies 2001 Executive Order 11988; Rivers and Harbors Act; Clean Water Act; Navajo Nation Clean Water Act; NPS Management Policies 2001, NEPA Executive Order 11990; Rivers and Harbors Act; Clean Water Act; Navajo Nation Clean Water Act; NPS

TABLE 2-4 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES		
Resource	Desired Condition	Source
Vegetation, Wildlife and Wildlife Habitat, and Special-Status Species	<ul style="list-style-type: none"> • Federal- and state-listed threatened and endangered species and their habitats are sustained. • Populations of native plant and animal species function in as natural condition as possible except where special management considerations are warranted. • NPS will strive to restore extirpated native plant and animal species to parks when specific criteria are met. • Management of populations of exotic plant and animal species, up to and including eradication, will be undertaken wherever such species threaten NRA resources or public health and when control is prudent and feasible. 	<p>Management Policies 2001</p> <ul style="list-style-type: none"> • Endangered Species Act; Navajo Nation Regulations (Resolution RCMA-31-01); NPS Management Policies 2001; National Environmental Policy Act • Navajo Nation Regulations (Resolution RCMA-31-01); Glen Canyon NRA's enabling legislation; NPS Management Policies 2001 • NPS Management Policies 2001 • NPS Management Policies 2001; Executive Order 13112, Invasive Species
Cultural Resources	<p><i>Archeological Resources</i></p> <ul style="list-style-type: none"> • Archeological sites are identified and inventoried, and their significance is determined and documented. • Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. • In those cases where disturbance or deterioration is unavoidable, the site is professionally documented and salvaged. <p><i>Historic Properties</i></p> <ul style="list-style-type: none"> • Historic properties are inventoried and their significance and integrity are evaluated under National Register criteria. • The qualities that contribute to the eligibility for listing or listing of historic properties on the NRHP are protected in accordance with the Secretary of the Interior's Standards (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable). 	<p><i>Archeological Resources</i></p> <ul style="list-style-type: none"> • National Historic Preservation Act; Executive Order 11593; Archeological and Historic Preservation Act; Archeological Resources Protection Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies 2001, NEPA <p><i>Historic Properties</i></p> <ul style="list-style-type: none"> • National Historic Preservation Act; Executive Order 11593; Archeological and Historic Preservation Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies 2001; National Environmental Policy Act

TABLE 2-4 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES		
Resource	Desired Condition	Source
	<p><i>Indian Trust Resources</i></p> <ul style="list-style-type: none"> Anticipated impacts to Indian trust resources are addressed in environmental documents. <p><i>Ethnographic Resources</i></p> <ul style="list-style-type: none"> Ethnographic information will be collected through collaborative research that recognizes the sensitive nature of such information. All agencies shall accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of these sacred sites. NPS acknowledges that American Indian Tribes, including native Alaskans, treat specific places containing certain natural and cultural resources as sacred places having established religious meaning, and as locales of private ceremonial activities. Consistent with Executive Order 13007, NPS will, to the extent practicable, accommodate access to and ceremonial use of Indian sacred sites by religious practitioners from recognized American Indian and Alaskan native Tribes, and avoid adversely affecting the physical integrity of such sacred sites. Other federal agencies, state and local governments, potentially affected Native American and other communities, interest groups, SHPO, and the Advisory Council on Historic Preservation will be given opportunities to become informed about and comment on anticipated NPS actions at the earliest practicable time. 	<p><i>Indian Trust Resources</i></p> <ul style="list-style-type: none"> Secretarial Order 3175; Department of Interior ECM 95-2, NPS Management Policies 2001 <p><i>Ethnographic Resources</i></p> <ul style="list-style-type: none"> NPS Management Policies 2001 Executive Order 13007 on American Indian Sacred Sites, National Environmental Policy Act NPS Management Policies 2001, Executive Order 13007 on American Indian Sacred Sites National Historic Preservation Act; Programmatic Memorandum of Agreement among the NPS, Advisory Council on Historic Preservation, and the National Council of SHPOs (1995); Executive Order 11593; American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007 on American Indian Sacred Sites; Presidential Memorandum of April 29, 1994, on Government-to-Government Relations with Tribal Governments; NPS Management Policies 2001

TABLE 2-4 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES		
Resource	Desired Condition	Source
	<ul style="list-style-type: none"> All agencies shall consult with Tribal governments prior to taking actions that affect federally recognized Tribal governments. These consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals. Parks will regularly consult with traditionally associated native Americans regarding planning, management, and operational decisions that affect subsistence activities, sacred materials or places, or other ethnographic resources with which they are historically associated. Certain research data may be withheld from public disclosure to protect sensitive or confidential information about archeological, historic, or other NPS resources when doing so would be consistent with the Freedom of Information Act (FOIA). In many circumstances, this will allow the NPS to withhold information about ethnographic resources. Native Americans and other individuals and groups linked by ties of kinship or culture to ethnically identifiable human remains will be consulted when remains may be disturbed or are encountered on NRA lands. <p><i>Collections</i></p> <ul style="list-style-type: none"> All museum objects and manuscripts are identified and inventoried, and their significance is determined and documented. The qualities that contribute to the significance of collections are protected in accordance with established standards. 	<ul style="list-style-type: none"> American Indian Religious Freedom Act; Presidential Memorandum of April 29, 1994, on Government-to-Government Relations with Tribal Governments; NPS Management Policies 2001 NPS Management Policies 2001 NPS Management Policies 2001; Native American Grave Protection and Repatriation Act (NAGPRA) <p><i>Collections</i></p> <ul style="list-style-type: none"> National Historic Preservation Act; American Indian Religious Freedom Act; Archeological and Historic Preservation Act; Archeological Resources Protection Act; NAGPRA; NPS Management Policies 2001
Public Safety	<ul style="list-style-type: none"> Visitor and employee safety and health are protected. 	<ul style="list-style-type: none"> NPS Management Policies 2001; NEPA; May 2000 Memorandum of Understanding between NPS and Navajo Nation for Emergency Law Enforcement Services

<p>TABLE 2-4</p> <p>REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES</p>		
Resource	Desired Condition	Source
Natural Soundscapes	<ul style="list-style-type: none"> NPS will preserve, to the greatest extent possible, the natural soundscapes of parks (including the NRA). NPS will restore degraded soundscapes to the natural condition wherever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound). Using appropriate management planning, superintendents will identify what levels of human-caused sound can be accepted within the management purposes of the NRA. The frequencies, magnitudes, and durations of human-caused sound considered acceptable will vary throughout the NRA, being generally greater in developed areas and generally lesser in undeveloped areas. In and adjacent to the NRA, NPS will monitor human activities that generate noise that adversely affects NRA soundscapes, including noise caused by mechanical or electronic devices. NPS will take action to prevent or minimize all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other NRA resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor uses at the sites being monitored. Weight restrictions for public roads. 	<ul style="list-style-type: none"> NPS Management Policies 2001; Director's Order 47
Transportation and Traffic	<ul style="list-style-type: none"> Weight restrictions for public roads. 	<ul style="list-style-type: none"> Federal Highway Administration and Arizona Department of Transportation Management Policies
Visual Resources	<ul style="list-style-type: none"> NPS will preserve, to the greatest extent possible, the natural lightscapes of the NRA, which are natural resources and values that exist in the absence of human-caused light. Recognizing the roles that light and dark periods and darkness play in natural resource processes and the evolution of species, NPS will protect natural darkness and other components of the natural lightscape in parks. To prevent the loss of dark conditions and of natural night skies, NPS will seek the cooperation of NRA visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks. 	<ul style="list-style-type: none"> NPS Management Policies 2001; Glen Canyon NRA Dark Sky Policy (2001)

TABLE 2-4 REGULATIONS AND POLICIES APPLICABLE TO ALL ALTERNATIVES		
Resource	Desired Condition	Source
Socioeconomics	<p><i>Land Use</i></p> <ul style="list-style-type: none"> • Maximize recreational opportunities, provide interpretive services, uphold legislative guidelines, and preserve scenic, scientific, and historic features. • Designate Antelope Point for recreational and tourist activities. <p><i>Environmental Justice</i></p> <ul style="list-style-type: none"> • Incorporate environmental justice into NPS mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. 	<p><i>Land Use</i></p> <ul style="list-style-type: none"> • Glen Canyon NRA GMP (1979); Antelope Point DCP/EA (1986) • Navajo Nation, Lechee Chapter Management Policy <p><i>Environmental Justice</i></p> <ul style="list-style-type: none"> • Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
Waste Management	<p><i>Solid Waste</i></p> <ul style="list-style-type: none"> • The Navajo Nation and NPS have the authority to manage, protect, and preserve the resources of the Navajo Nation; to maintain the aesthetic appearance of the Navajo Nation; and provide for the exercise of the inherent sovereign powers of self-government by the Navajo Nation. 	<p><i>Solid Waste</i></p> <ul style="list-style-type: none"> • Navajo Nation Solid Waste Act (1997); Navajo Nation Solid Waste Regulations (1999); Resource Conservation and Recovery Act (RCRA); NPS Management Policies 2001; Executive Order 12780, Federal Agency Recycling and the Council on Federal Recycling and Procurement Policy; Executive Order 12873, Federal Acquisition, Recycling, and Waste Prevention
Waste Management (continued)	<p><i>Hazardous Waste</i></p> <ul style="list-style-type: none"> • Manage the collection, transportation, separation, recovery, and disposal of hazardous waste in accordance with all applicable laws. 	<p><i>Hazardous Waste</i></p> <ul style="list-style-type: none"> • Resource Conservation and Recovery Act of 1976; Navajo Nation Management Policies
Energy Management	<ul style="list-style-type: none"> • Integrate facilities into the landscape; facility developments should include improvements in energy efficiency and reduction in “greenhouse gas” emissions for both the building envelope and the mechanical systems that support the facility. Maximum energy efficiency should be achieved using solar thermal and photovoltaic applications, renewable energy technologies, appropriate insulation and glazing strategies, and energy-efficient lighting and appliances. Energy-efficient construction projects should be used as an educational opportunity for the visiting public. 	<ul style="list-style-type: none"> • NPS Management Policies 2001; Executive Order 12759, Federal Energy Management; Executive Order 13123, Greening the Government Through Efficient Energy Management

2.8 MITIGATION MEASURES COMMON TO ALL ACTION ALTERNATIVES

Construction, operation, and maintenance of the proposed facilities would follow guidelines established in the Draft Environmental Management Plan (EMP) (URS 2001) and draft Standards and Guidelines for Sustainability for Antelope Point (Sustainability Guidelines) (Hudgins 2001). The Environmental Management Plan was developed with a primary objective of protecting water quality, as well as other natural and cultural resources. The Environmental Management Plan would be implemented to ensure compliance with applicable laws and regulations, and to minimize potential environmental effects associated with the Project through mitigation measures; measures taken would include established industry best management practices. The intent of the Sustainability Guidelines is to ensure that design, construction, and operating methods are established to minimize adverse economic, cultural, and environmental impacts of the Project. The Sustainability Guidelines incorporates standards created by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED).

2.8.1 Project Oversight

The Sustainability Guidelines for Antelope Point establish environmental and architectural standards that must be met. A seven-member Sustainability Review Board (SRB), established by Antelope Holdings, would regulate compliance with the standards. The SRB would provide a "third party" review of the design, construction and operation of the Project. The Navajo Nation and National Park Service would each have a representative on the SRB. Other representatives would include a LEED-certified architect, a landscape architect, a civil engineer, and a representative of Antelope Holdings. In addition to membership on the SRB, the Navajo Nation and National Park Service would periodically review Antelope Point operations to ensure compliance with the Environmental Management Plan, Sustainability Guidelines, as well as federal, state, and local regulations.

2.8.2 Construction

Ground clearing and construction activities for all facilities (dry storage area, campground, hotel and cultural center, employee housing) and associated parking area would occur within the designated footprint and within a 50-foot buffer around that area to minimize soil and vegetation disturbance, generation of fugitive dust, and potential stormwater runoff. Water from on-site wells would be applied to exposed areas during construction to further minimize fugitive dust. In addition, all construction equipment would be maintained properly in optimal running condition to minimize emission from construction equipment. Antelope Holdings would minimize impervious areas and revegetate exposed areas following construction with native plantings to further control stormwater runoff; all plantings would be selected from a National Park Service and Navajo Nation pre-approved native plant list (URS 2001).

To reduce potential impacts on soundscapes, all construction vehicles and equipment would be equipped with properly operating and maintained mufflers. In addition, noise-generating construction activities would be limited to daylight hours to minimize the potential impacts on overnight visitors of Antelope Point.

2.8.3 Operations

The marina would use fixed or floating piers to enhance water circulation. Additionally, the final designs would place the Marina Village where dredge needs would be minimized (URS 2001).

The buildings would have sloped, colored roofs and would be complementary in style to the other resort buildings. Exterior walls would be painted or colored in deep earthtone colors to blend with the lake and surrounding terrain.

Fuel Dock

The EMP outlines minimum specifications for the fuel dock to reduce any potentially adverse impacts from fuel spills, including: (1) all petroleum storage tanks would meet National Fire Protection Association (NFPA) 30 guidelines; (2) all fuel-related equipment would be inspected regularly and in accordance with a set inspection schedule, and inspections would be documented; (3) fueling facilities would be located in the marina wakeless area to avoid waves and wakes; (4) back pressure shut-offs and vapor recovery nozzles would be installed as standard equipment at all fueling pumps (and holding clips to keep fuel nozzles open, which are illegal at marina fuel docks, would not be installed); (5) spill kits would be located at each fueling area; (6) fueling procedures would be posted in each fueling area; and (7) all dock personnel would be trained in emergency procedures.

In addition, the fueling dock would be covered to reduce heat and sunlight in the fueling area, which reduces the potential for poor fueling practices by individuals overcome by extreme heat and sunlight (i.e., people who are cooler and protected from the extreme sunlight will pay more attention to their fueling operations, thereby reducing overspills).

Dry Storage Screening

Between the road and the fence line, the grade would be raised and native desert plantings installed to a density that would screen the dry storage area and other uses from view. A screening wall, possibly constructed of masonry, also would be located on the raised grade (bermed) to limit views of the storage area from the road. The location would allow the small hill to the north to mitigate views of the dry storage facility from the hotel and cultural center. The area along the road-facing side of the screening wall would be mitigated using the same combination of measures.

Hotel and Cultural Center

The hotel and cultural center would be designed and constructed to include elements of the Navajo cultural community environment. Buildings would include natural stonework, wood, and rusted steel, and would include areas painted earth tone colors to blend with the surrounding environment. Design of the hotel and cultural center would follow the Sustainability Guidelines for Antelope Point, including features to conserve energy and water (refer to Section 2.8.4 below).

Hazardous Material and Waste Management

According to the Environmental Management Plan (URS 2001), the amount of hazardous materials and wastes on site would be minimal because Antelope Holdings would: (1) purchase only those quantities of hazardous materials required to meet facility needs (i.e., excessive quantities would not be ordered merely to benefit from price breaks); (2) order the smallest sized practical containers for that material to limit the size of any possible spills; (3) purchase the least hazardous, comparably performing product; and (4) train all employees who have occasion to encounter a hazardous chemical during the course of their work of the proper handling of the materials and what to do in case of a spill. Antelope Holdings also has committed to recycling as the preferred disposal method for any hazardous wastes as appropriate; landfill applications would be the last disposal choice.

Solid Waste Management

Antelope Holdings has committed to reducing the generation of solid waste at Antelope Point during construction in its Draft EMP (URS 2001). As part of its Proposal, Antelope Holdings would target the following goals:

- X using a minimum of 20 percent materials that contain at least 20 percent post-consumer recycled content or a minimum of 40 percent post-industrial content;
- X recycling 75 percent of the materials remaining after construction of individual facilities through donation to the Navajo Nation, or returning the materials to the manufacturer or distributor, or reintroducing materials into the marketplace;
- X establishing criteria for project bidding packages regarding materials, pallet recycling, reduced packaging of materials, and other contractual incentives to reduce waste; and
- X locating separation bins for construction wastes in areas easily accessible to workers, and clearly labeling the bins in both English and Navajo.

In addition, Antelope Holdings would encourage waste reduction during operation by adopting the following practices:

- X establishing a purchasing policy to reduce the volume of materials entering the site;
- X establishing a target of 50 percent of all dry solid waste being recycled or reused;
- X eliminating the use of chlorofluorocarbons (CFCs) and hydro fluorocarbons (HFCs) in all building materials;
- X composting wet wastes from restaurant operations, if quantities dictate; and
- X providing adequate, reasonably attractive trash receptacles that are color-coded and clearly labeled to distinguish recyclable materials from disposable wastes.

Lighting

All outdoor lighting would be designed to light only the area needed for safety and security. Timing devices and motion detectors would be used to prevent unnecessary lighting. Lighting also would be shielded and focused downward to prevent degradation of night skies. The Project would be required to comply with Glen Canyon NRA's Dark Sky Policy.

2.8.4 Energy and Water Conservation

Development of the Marina Village, hotel, cultural center, and other facilities would be subject to the U.S. Green Building Council's LEED standards. The project design and implementation would include specific energy-efficient measures for lighting, building materials, window glazing, passive solar heating, passive cooling strategies, and other design details (Hudgins 2001). Additionally, Antelope Holdings would look for industry best management practices to reduce gasoline consumption, improvement of emissions, or fuel switching in the fleet of watercraft that they maintain. Based on the draft standards prepared, energy management would become a major part of the development and operations at Antelope Point, as required by National Park Service *Management Policies 2001*.

Measures would be implemented to conserve water during construction, operation, and maintenance of the Project. Specifically, the Project would include water conservation fixtures in all facilities (e.g., aerators on sink faucets, low-flow shower heads and toilets), and only indigenous vegetation would be used in landscaping to minimize irrigation demands. The Draft EMP specifies multiple targets for the Project, including the establishment of a measurement and verification system for the ongoing accountability and optimization of building energy and water consumption performance over time.

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the affected environment, or physical and social conditions, currently present within the 950-acre project site and proposed marina location. The area examined considers primarily the Antelope Point peninsula and surrounding lake waters previously delineated by the Navajo Nation and National Park Service in the 1986 Antelope Point Development Concept Plan/Environmental Assessment (DCP/EA).

3.2 AIR QUALITY

3.2.1 Climate

Antelope Point is located within a region with a relatively mild southwestern climate conducive to long visitor seasons. March to October is pleasant for most outdoor activities. Summer temperatures are generally hot and sunny with average July maximum temperatures of 95 to 97 degrees Fahrenheit (°F). January is generally the coldest month with an average high temperature of 43°F and an average low temperature of 24°F, with a record low of -4°F. The 24-hour temperature ranges are significant; a 30°F range is common. The effect of intense sun in the open during summer is amplified by reflection from light-colored soils and water surfaces. Natural shade is practically non-existent at Antelope Point.

Precipitation is irregular, averaging approximately 7 inches per year with a range of 2.5 to 10 inches. Most precipitation is rain, falling in a two-season pattern: late summer thunder-showers and cool winter rains or snow. The thundershowers are a significant planning variable because they cause high surface runoff and flash floods in desert drainages and can lead to hazardous boating conditions on Lake Powell.

3.2.2 Air Quality

The Clean Air Act (CAA), a federal air quality law, is intended to protect human health and the environment by reducing emissions of specified pollutants at their source. In accordance with this law, permits are required for any stationary facility that qualifies as a “major source.” Further, the CAA outlines three types of airshed classification areas—Class I, II and III. The Glen Canyon National Recreation Area (NRA) is located within a Class II airshed, in which the demonstrated impact of a new stationary source facility may emit no more than 100 tons of a regulated pollutant annually before needing a permit.

The Navajo Tribal Council found that air pollution exists with varying degrees of severity within Navajo Nation lands (URS 2001). Thus, the Navajo Nation enacted its own legislation, the Air Pollution Prevention and Control Act, which is intended to control sources of air pollution on Navajo Nation lands. The Navajo Nation coordinates closely with the U.S. Environmental Protection Agency (EPA) regarding new sources.

Air quality data for four of the six criteria pollutants that are regulated by the EPA (which includes sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, particulate matter, and lead) are measured and recorded by Salt River Project at the Glen Canyon Dam next to the Carl Hayden Visitor Center. No data are available for carbon monoxide or lead within the Antelope Point area. Ambient air quality data at Glen Canyon NRA for 1996 through 1999 are presented below with a comparison to the federal standards for those pollutants.

**TABLE 3-1
GLEN CANYON AMBIENT AIR QUALITY DATA 1996-2000**

	Standard	1996	1997	1998	1999
<u>Sulfur Dioxide (SO₂)</u>					
• Max 3-hour- $\mu\text{g}/\text{m}^3$	1,300	152	125	70.8	51.3
• Max 24-hour- $\mu\text{g}/\text{m}^3$	365	43.6	36.5	24.4	17.5
• Annual Average	80	4.0	5.0	3.5	2.2
• No. of Samples	-	8,201	8,559	8,666	7,947
<u>Nitrogen Dioxide (NO₂)</u>					
• Max 1-hour- $\mu\text{g}/\text{m}^3$	-	54.7	52.5	97.6	91.7
• Max 24-hour- $\mu\text{g}/\text{m}^3$	-	23.3	20.5	31.9	34.4
• Annual Average	100	3.3	4.3	4.6	3.8
• No. of Samples	-	7,849	8,555	8,671	8,210
<u>Ozone (O₃)</u>					
• Max 1-hour- ppm	0.120	0.074	0.069	0.070	0.073
• Max 2 nd high- ppm	-	0.073	0.067	0.070	0.070
• No. of Samples	-	8,322	8,540	8,634	8,328
<u>Particulate Matter (PM₁₀)</u>					
• Max 24-hour- $\mu\text{g}/\text{m}^3$	150	40.6	29.2	28.1	20.5
• Annual Average	50	10.3	9.4	7.4	7.4
<u>Particulate Matter (PM_{2.5})*</u>					
• Max 24-hour- $\mu\text{g}/\text{m}^3$	65	-	11.0	10.2	8.7
• Annual Average	15	-	4.5	3.3	3.2
$\mu\text{g}/\text{m}^3$ – micrograms per cubic meter ppm – parts per million * PM _{2.5} was not regulated or monitored prior to 1997. Source: Salt River Project, Navajo Generating Station 2000					

3.3 GEOLOGY AND SOILS

3.3.1 Physiography

The Antelope Point development area covers approximately 950 acres. It contains irregular surface features resulting from the weathering of upper Navajo sandstone. Total relief on Antelope Point is approximately 150 feet depending on the lake level. Weathering of the Navajo sandstone has resulted in scenic domes and low hills, accentuated by crossbedding patterns. In the southern part of the site, and along the western edge of Antelope Point, crossbedded strata have been weathered by differential erosion into rugged-looking, but physically delicate, patterns of miniature ridges and grooves occurring at a variety of angles to each other. These patterns provide a highly scenic and rustic-looking backdrop for the entire area.

The highest spot on Antelope Point, a knoll, is a remnant Pleistocene alluvial deposit of sand, gravel, and clay that was a former channel of the Colorado River before the last major canyon cutting cycle took place. The north side of this knoll has a relatively steep slope, in excess of 25 percent, and is somewhat unstable. Gravel from the alluvial deposit frequently rolls down the slope, and soil erosion is accentuated by vehicle activity on several trails that cross the slope. The gravel pit at the top of Antelope Point has been partially mined, leaving an open pit scar of approximately 5 acres.

According to Potter and Pattison (1977), the most common surface landform found along the Antelope Point shoreline is “shelfy terrace.” This landform is common in the lower end of Lake Powell where the surface rock is finely crossbedded with alternate hard and soft layers. These erode into projecting shelves tilted at different angles due to the crossbedding patterns. The entire east side of Antelope Point is of this nature, excepting a 300-foot section of sandy beach on the south side of the proposed marina site and a cliff face approximately 2,000 feet southeast of the marina site. The north side of Antelope Point consists of sandy beach alternating with Pleistocene alluvium, and the west side is composed entirely of shelfy terrace alternating with cliff faces. The terraces, cliffs, and sandy beaches of the lakeshore, in combination with the intricately weathered Navajo sandstone, give Antelope Point a scenic and wild appearance that has attracted people to the site for many years.

3.3.2 Geology

At the Antelope Point Project site, the bedrock is composed of Navajo sandstone, one of the most conspicuous formations in the lower Glen Canyon area and on the Navajo Indian Reservation (Harshbarger et al. 1957). The Carmel formation, consisting of deep reddish sandstone and siltstone, is visible just one mile north on Antelope Island. Although no Carmel formation rocks have been found on Antelope Point, this provides evidence that Antelope Point rocks are of the uppermost Navajo sandstone (Malespin 1981). In the vicinity of Antelope Point, the Navajo sandstone is up to 1,400 feet thick, but only the uppermost 100 to 150 feet is exposed above the shore when the lake is at its fullest level. The rock is pale orange, pale reddish-brown to gray in color and is composed of medium- to fine-grained subrounded quartz grains, bonded by a weak calcareous cement (Harshbarger et al. 1957). The formation developed from ancient windblown dune deposits of late Triassic/Jurassic time (approximately 200 to 220 million years ago). It displays prominent crossbedding and typically weathers into low rounded hills and domes, with the crossbedding conspicuously etched out by differential erosion. The Navajo sandstone is absorptive, exhibits capillarity, and is highly permeable.

The uppermost 30 to 35 feet of the highest knoll on Antelope Point are Pleistocene alluvium, consisting of coarse gravel and small boulders, up to 6 inches in diameter (Potter and Pattison 1977). These deposits are streambed materials from a former channel of the Colorado River. They were formed during Pleistocene time (1 to 2 million years ago), just before the last major regional uplift led to renewed down-cutting by the Colorado River and formation of the canyon now inundated by Lake Powell. Although the gravels are thickest at the knoll, a thin veneer of well-rounded gravels and cobbles stained by desert varnish covered virtually all outcrops of Navajo sandstone in the area, and make desert pavement on many level sandy areas.

A second Pleistocene alluvial deposit is found at high lake level all along the north side of Antelope Point. This alluvium is also a remnant of an earlier channel of the Colorado River and is composed of coarse gravel and cobbles up to 6 inches in diameter in a clay/silt matrix. Because of the clay matrix, these deposits are somewhat consolidated, in contrast to the alluvium on the knoll, which is not at all consolidated.

The Navajo sandstone is virtually devoid of fossils. No paleontological resources would be expected.

3.3.3 Soils

Soils of Antelope Point are medium-to-fine-grained buff to reddish-brown sands, which have been derived from weathering of the loosely cemented Navajo sandstone. They are classified as “Typic torripsamment mixed mesic” soils (Bureau of Indian Affairs [BIA] nd), denoting a sandy, undeveloped soil formed in a warm climate. These soils have little or no developed structure. Some sands weathered in place and remain in proximity to the parent rock, while others have been windblown and redeposited, perhaps miles from their parent source. Windblown deposits of sand are found most often on the east side of Antelope Point, on east-facing slopes sheltered from the prevailing wind. The largest deposit of this kind, approximately 4 acres in size, is located 1,500 feet southeast of the proposed marina site. In most places, the sand is very shallow, ranging in depth from a thin veneer of only a few inches to 2 or 3 feet. In local areas where windblown deposits have accumulated, depths to bedrock may be up to 10 feet. The sandy soils at Antelope Point are highly porous, rated as rapidly permeable, and excessively drained. The soils are severely erodable due to loose structure, aridity, and shallow depths.

With two exceptions, Antelope Point soils contain almost no clay and would not be expected to change volume with differences in water content. Deposits of clay are found intermixed with the Pleistocene alluvium at the knoll near the northern tip of Antelope Point. These occurrences of clay are found intermittently throughout this deposit in the form of lenses ranging in thickness from 3 to 6 feet. The size of the alluvial deposit is estimated to be 10 to 15 acres, and rough estimates of its volume made by a local sand and gravel contractor range from 200,000 to 500,000 cubic yards. Because of the highly porous nature of this alluvium on the knoll, most precipitation, even when intense, is absorbed. However, exposure of clay lenses by mining of gravels has created localized sheet runoff, causing limited erosion into the gravels on the periphery of the exposed clay.

The second occurrence of clay is in the alluvial deposits at lake level on the north side of Antelope Point. This clay is almost silty in texture and forms the matrix of the alluvium, which contains gravel and cobbles up to 6 inches in diameter. This deposit has an overall appearance of a poorly consolidated conglomerate. These soils are rated unsuitable for sustained irrigation and have severe limitations as material for foundation for roads and buildings, septic tank, and sewage lagoons, principally due to texture and shallow depths. Blowing sands present soil limitations for recreational use.

3.4 WATER RESOURCES

3.4.1 Surface Water

Lake Powell is the second largest manmade lake in the United States and has a surface area of 226 square miles with a volume of 27,000,000 acre-feet. The dam that created the lake regulates flow of the Colorado River, stores water for beneficial consumptive use, allows upper basin states to use their water allocation, and provides for the reclamation of lands, control of floods, and generation of hydroelectric power. The normal operating elevations of the lake range between 3,490 and 3,700 feet above sea level. The minimum elevation of the reservoir is 3,370 feet (dead storage), and the maximum is considered 3,700 feet (full pool). The reservoir is managed by Bureau of Reclamation (BOR) to prevent lake levels from rising above 3,700 feet. Lake levels are highest in mid-summer after receiving spring runoff from the Rocky Mountains; they are lowest in March or April of each year.

Antelope Point overlooks a narrow (approximately 2,400 feet) section of lake channel that was once the main channel of the Colorado River. Antelope Island, remnant of a mesa above Wahweap Creek, is on the other side of the channel. Antelope Point is bounded on the southwest by a narrow arm of the lake extending up Antelope Creek. The lake channel widens into a small bay on the east side of Antelope Point. This area has been previously investigated for its potential as a marina site. At full pool of the lake (3,700 feet), depths of 30 to 50 feet prevail over certain portions of the bay. Beyond the narrow shelves and shallow water below the present shoreline, the lake bottom profile plunges steeply into the old canyon. Mid-channel depths are 500 to 600 feet. The shoreline and bottom profiles appear stable, as there are no major sediment sources in the vicinity. However, the morphology is not fully known.

Because of Lake Powell's importance as a resource and the number of people using it for recreation, water quality is monitored bi-weekly for fecal coliform (FC) bacteria (Anderson 2000). Every two weeks, scientists take water samples at about 50 beach and marina locations. When a sample exceeds 200 FC colonies per 100 milliliters of water, the site is resampled. Resampling continues if FC counts remain high. When counts remain high for two consecutive samplings, the site is recommended for closure to swimming. Signs and bright yellow buoys mark the closed areas. Levels of FC bacteria indicate the potential presence of pathogens. Main-channel lake waters near Antelope Point are nearly always of high clarity and quality and would be expected to meet standards for full-body contact sports such as swimming and water-skiing. However, due to its historic limited recreational use, Antelope Point is not specifically monitored regularly for FC. Sampling through the 2001 season included over 600 samples; no high counts were recorded (Water Quality Program meeting minutes, October 3, 2001). Further, the National Park Service continues to follow a Water Quality Program, which was initially developed in 1988 to improve the water quality of Lake Powell. Monitoring and enforcement protocols for the program were updated in 1995, which resulted in 12 beach closures in 1995 alone, and 11 closures from 1996 through 1998. In 1998, floating restrooms and pump-outs were implemented. In 1999, only 1 closure occurred, and since then no beach closures have occurred as a result of bacterial contamination.

3.4.2 Groundwater

In 1998, the Navajo Department of Water Resources drilled two groundwater wells at Antelope Point with the intent of providing water to the future Antelope development. Well No. 1, drilled to a depth of 525 feet, indicated a depth to groundwater of 100 feet. Well No. 2, drilled to a depth of 540 feet, indicated a depth to groundwater of 67 feet. A pump test of well No. 2 indicated that this well would be capable of providing between 300 and 400 gpm of water (Foley 2001). The Navajo Nation has not permitted either of these wells for use; permits would be acquired prior to project operation.

Water from the Navajo sandstone aquifer, the chief aquifer in the area, is typically of good quality, containing low levels of dissolved solids and low salts. The arsenic level in well No. 1 was measured at 126 parts per billion (ppb); an arsenic level of 17 ppb was measured in well No. 2. These wells exceed the current federal arsenic standard of 10 ppb (*Federal Register*, January 22, 2001; adopted October 31, 2001).

3.5 VEGETATION

The Glen Canyon NRA is physiographically located within the Colorado Plateau and supports southern Great Basin vegetation. Turner (1994) classifies Antelope Point as Cold Temperate Desertland within the Great Basin Desertscrub. Blackbrush (*Coleogyne ramosissima*) and shadscale (*Atriplex confertifolia*) are dominant species.

Antelope Point supports a variety of shrubs and subshrubs as well as numerous grasses and ephemeral species. Species include blackbrush, Mormon tea (*Ephedra torreyana*), yucca (*Yucca angustissima*), snakeweed (*Xanthocephalum microcephala*), sand sagebrush (*Artemisia filifolia*), prickly pear (*Opuntia ericacea*), and Indian rice grass (*Oryzopsis hymenoides*). The recently established full-pool shoreline supports exotic species including tamarisk (*Tamarix* spp.) and Russian thistle (*Salsola kali*).

Although no quantitative vegetation data have been collected at Antelope Point, surveys were completed on Antelope Island, 300 meters north of the project site (Malespin 1981). The total plant cover there was estimated at 6.1 percent during winter. Spring and summer cover estimates might range from 5 to 15 percent depending on the sampling period. Antelope Point has similar vegetative characteristics.

3.6 WILDLIFE AND WILDLIFE HABITAT

“Approximately 80 species of mammals, 32 species of reptiles and amphibians, and over 200 species of birds have been found in or near the Lake Powell area” (Malespin 1981). Added to this are up to 20 species of fish that thrive in the clear, clean water of the lake. The most notable of these are the game fishes, which attract many visitors to the Lake Powell region. The striped bass, rainbow trout, large-mouth bass, black crappie, walleye, bluegill, and channel catfish all contribute to the sport fishery. Shad are especially abundant, forming the food base for larger predatory fish like striped bass.

The Antelope Point site is thinly vegetated, offering limited habitat for terrestrial wildlife. It is populated by small mammals such as cottontail and jackrabbit; rodents of the kangaroo rat, deer mouse, pocket mouse, and woodrat groups; and small reptiles such as the desert spin lizard, side-blotched lizard, and western whiptail lizard. King snakes, gopher snakes, and several subspecies of the western rattlesnake (*Crotalus viridus*) occur in the region. Some of these snakes probably reside on Antelope Point, since the rodent prey base exists there. Coyote may be seen occasionally and, more rarely, the ringtail cat.

Resident birds are few (the raven being most obvious), but the lake environs provide excellent opportunities for observing numerous transient and migrant species. Waterfowl such as the coot, grebes, and ducks are commonly seen, as well as a variety of land birds.

3.7 SPECIAL STATUS SPECIES

The Endangered Species Act of 1973 requires an examination of impacts on all federally listed threatened or endangered species. National Park Service policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, or sensitive species.

According to the U.S. Fish and Wildlife Service (FWS), there are 21 species in Coconino County that are listed as federally endangered or threatened, proposed for listing, candidate species, or species protected through conservation agreements. The Navajo Fish and Wildlife Department (NFWD) has recorded 14 special status species nearby, but none have been observed at Antelope Point (NFWD 2002). The Arizona Game and Fish Department (AGFD) lists approximately 80 species within Coconino County as special status.

While the razorback sucker (*Xyrauchen texanus*), a federally endangered species, has been identified in Lake Powell waters, it was found at the northern end of the lake, more than 100 miles from Antelope Point. This species is not known to exist in the Antelope Point area.

Based on habitat conditions at Antelope Point, only two of the species identified by FWS and the NFWD would be expected to occur in the vicinity of the project site (Henderson 2002; Schulman 2002). Bald eagle (*Haliaeetus leucocephalus*) has been observed feeding at Antelope Island during the winter months, but no nest sites have been observed or recorded at Antelope Island or Antelope Point. California condor (*Gymnogyps californianus*) has been observed near the project site (at Page, Arizona) year-round; none have been observed or recorded at Antelope Point.

TABLE 3-2 SPECIAL STATUS SPECIES POTENTIALLY OCCURRING WITHIN THE ANTELOPE POINT PROJECT SITE		
Species	Common Name	Status
<i>Haliaeetus leucocephalus</i>	Bald eagle	Threatened
<i>Gymnogyps californianus</i>	California condor	Endangered
Sources: FWS 2001		

Correspondence with agencies is provided in Appendix A.

3.8 CULTURAL RESOURCES

The cultural environment includes those aspects of the physical environment that relate to human culture and society, along with the social institutions that form and maintain communities and link them to their surroundings. In accordance with National Park Service procedures, five categories of cultural resources were considered—archeological resources, historic buildings and structures, cultural landscapes, ethnographic resources, and museum objects.

3.8.1 Cultural Resource Inventory

In 1984, a cultural resources inventory was conducted within the development area (Benallie and Gilpin 1985). The surveyed area included approximately 710 acres within Sections 8, 9, 16, and 17, Township 41 North, Range 9 East. The area of potential effect as defined in the 1986 DCP/EA also included a portion of Section 21, but this section was not included in the original survey nor did the survey effort recognize this Section as part of their assigned area of potential effect. To date, no cultural resource inventory has been completed within Section 21.

3.8.2 Archeological Resources

The survey effort identified eleven archeological sites (designated as AZ-K-5-1 through -11), all of which were considered eligible to the National Register of Historic Places under Criterion D. The Arizona State Historic Preservation Office (SHPO) concurred with that determination in a letter dated September 22, 1986.

The National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.); the National Environmental Policy Act (NEPA); and the National Park Service's Cultural Resource Management Guidelines (1996), NPS *Management Policies 2001*, and Conservation Planning, Environmental Impact Analysis and Decision Making Handbook (2001) require the consideration of effects on cultural resources, including those listed on or eligible for listing on the National Register of Historic Places.

A data recovery plan was completed in 1986 that provided a means to mitigate the adverse effects of the proposed Antelope Point Development Project on these eligible properties. The Arizona SHPO, the Navajo Nation Historic Preservation Department (NNHPD), and the Advisory Council on Historic Preservation reviewed the plan and an antiquities permit to conduct archeological studies was issued on February 23, 1987. In 1988, data recovery was undertaken at nine of the eleven sites located during the course of the 1984 survey (Anderson and Beardon 1992). These investigations included collection of surface artifacts, excavations, and analysis of recovered artifacts.

The adverse effects of the proposed development on nine of the eleven archeological sites determined eligible to the National Register of Historic Places was mitigated through the 1988 data recovery. In a letter dated September 25, 1997, the Arizona SHPO concluded that Glen Canyon NRA had successfully fulfilled their Section 106 responsibilities under 36 CFR 800. A letter from the NNHPD dated November 19, 2001 also concurred with that determination.

During the 1988 data recovery period, site relocation efforts determined that two of the eleven archeological sites, AZ-K-5-1 and AZ-K-5-2, were found to be outside the original surveyed area and within Section 21. Although a portion of Section 21 was part of the identified area of potential effect as described in the 1986 DCP/EA, it was not considered to be part of the area that needed cultural resource clearance. Therefore, no further effort was made to mitigate the adverse effects of the proposed project on these two eligible sites.

3.8.3 Historic Buildings and/or Structures

No historic buildings and/or structures were identified during the 1984 cultural resources inventory.

3.8.4 Cultural Landscapes

According to the National Park Service's Cultural Resource Management Guideline (DO-28), a cultural landscape is

“....a reflection of human adaption and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.”

There are no cultural landscapes present within the Antelope Point Project site.

3.8.5 Ethnographic Resources

Ethnographic resources are defined by National Park Service as any “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (Cultural Resource Management Guideline, DO-28:191). Consultations with Tribes conducted by the National Park Service are described in Section 3.8.2. There are no known ethnographic resources in either the project area or its general vicinity. Two ceremonial sites were identified during the 1984 cultural resources inventory and are considered to be ethnographic resources. These sites were determined to be not eligible to the National Register of Historic Places (Anthony Klesert, 1987). This determination was based on the fact that the beaches at Antelope Island were created only after Glen Canyon Dam was completed in 1964 and the Lake Powell began to fill. The ceremonial use of the beaches are therefore of relatively recent origin and not eligible for inclusion on the National Register of Historic Places. Despite this determination, an attempt was made to accommodate the needs of the Diné Medicineman's Association, Inc. and further consultation identified an acceptable alternative to the original ceremonial location.

The National Park Service conducted additional consultations with Tribes and no other ethnographic resources in either the project area or its general vicinity were identified. Copies of the environmental assessment will be forwarded to each affiliated tribe for review and comment. If the tribes subsequently identify the presence of ethnographic resources, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of ethnographic sites

would not be made public. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001) of 1990 would be followed. Because there are no known ethnographic resources within the Project area or its general vicinity, ethnographic resources was not addressed as an impact topic.

3.8.6 Museum Objects

No museum objects were identified during the 1984 cultural resources inventory.

3.9 PUBLIC SAFETY

Antelope Point is currently primitively developed and thus has no public safety facilities. Public safety facilities in proximity are located in the City of Page and in the Wahweap area. The nearest Navajo Nation public safety facility is the Tuba City Police District. Jurisdiction for handling public safety issues (i.e., law enforcement) generally lies with the Navajo Tribal Police and Rangers and National Park Service Rangers, but could include Coconino County Sheriff, Federal Bureau of Investigation, and/or BIA. In May 2000, the Navajo Nation and National Park Service signed a Memorandum of Understanding (MOU) for the coordination of emergency law enforcement assistance within the area designated as the Antelope Point development project area. Through this MOU law enforcement services are provided at Antelope Point.

Emergency medical service facilities are located in the City of Page, Arizona. Page facilities include one acute care hospital, one medical clinic, one mental health clinic, and three dental clinics. The fire and police departments are fully staffed and operated by the City of Page. The nearest Navajo Nation emergency medical service facility is in Inscription House Chapter, which is more than an hour away.

3.10 NATURAL SOUNDSCAPES

The Antelope Point area is developed with only one road, a park entry station, and one parking area. Current man-made sound includes vehicle traffic, recreationists using the beach area, and noise emanating from motorized watercraft and occasionally passing aircraft (from Page Municipal Airport). The Navajo Generating Station, about 4 miles southeast of Antelope Point, occasionally can be heard. Noise levels at Antelope Point have not been quantified. However, Antelope Point is located in an area designated as a “potential development site” in the GMP, with much of the surrounding NRA land designated as part of the recreation and resource utilization (RRU) zone.

3.11 TRANSPORTATION AND TRAFFIC

From the City of Page, access to Antelope Point is available via State Route 98 and Antelope Point Road, the entry road to the project area. Current facilities at Antelope Point consist of a beach access road and a gravel parking lot that accommodates 383 vehicle/trailers. The parking area is scheduled and approved for paving in Spring 2002.

Salt River Project maintains an improved access road from State Route 98 to the water intake facility for the Navajo Generating Station (southeast of project area). Four miles of this road is also the access route to Antelope Point. Access to the water pump station would continue to be required along this road.

Traffic in and out of Antelope Point is limited to park visitors, waste management trucks, and Navajo Nation and National Park Service personnel, with the greatest numbers generated from park visitors. A summary of vehicle counts for the summer of 2001 is provided in Table 3-3.

TABLE 3-3 MONTHLY VEHICLE COUNTS AT ANTELOPE POINT MAY-SEPTEMBER 2001		
Month	Total Vehicles	Daily Average
May	2,122	68
June	5,787	193
July	8,210	265
August	6,031	195
September	2,693	87
Source: Navajo Nation Parks and Recreation Department (NNPRD) 2001		

3.12 VISUAL RESOURCES

The views in the Antelope Point area include primarily natural landscapes and little development. Views include rocky cliffs, gently sloped red rock areas, and open water. There is sparse vegetation within the rocky areas. The ridgelines at Antelope Point appear flat to gently sloped and have slightly more vegetative cover than the rockier shoreline and cliff areas.

The General Management Plan (GMP) for the Glen Canyon NRA established four classes of scenic resources for the surface area surrounding Lake Powell (Table 3-4). Antelope Point is located within Navajo Reservation and has not been classified in the GMP for the Glen Canyon NRA. Views back toward the NRA from Antelope Point include Antelope Island and Wahweap. Antelope Island is a Class IV landscape; Wahweap is a Class III landscape.

Despite a viewshed with Class III and Class IV landscapes, there are few developed uses in views from Lake Powell near Antelope Point that disrupt the natural landscape or provide night lighting. One notable exception is the Navajo Generating Station, which is visible from most locations on Lake Powell near Antelope Point.

TABLE 3-4 SCENIC CLASSIFICATIONS		
Class	Type	Description
Class I	Outstanding	Contain scenery superior in size, form, contrast, color, angularity, diversity of form and color, rate of change of these attributes, and uniqueness. Typically deep canyons, unique geological structures, and intricately carved landscapes.
Class II	Superior	May contain a single property of superior quality, such as immensity, or great angularity, or diversity of form and color, but the sum of all their properties is distinctly less than the sum for Class I areas.
Class III	Interesting	Recognizably less interest than Class II areas: features lack the grandeur, superiority, prominence or notability of those of Classes I and II, but they nonetheless lend considerable interest to the general scene.
Class IV	Unremarkable	Relatively flat, monotonous expanses of shrub or piñon-juniper communities where each of the landscape qualities cited above has the lowest rank. Antelope Island is considered Class IV.
Source: NPS 1979		

3.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.13.1 Land Use

Existing Land Status and Use

The lands at Antelope Point are principally held in trust by the United States for the Navajo Nation. In 1974, Public Law 93-493 transferred the Page townsite from BOR and permitted its incorporation. This same act authorized the transfer of Antelope Point lands lying above 3,720 feet back to the Navajo Nation and lands below 3,720 feet to the Glen Canyon NRA. This action was accomplished by Public Land Order 5687.

As established in the GMP (NPS 1979), the primary objectives for the Glen Canyon NRA are to maximize recreational opportunities, provide interpretive services, uphold legislative guidelines, and preserve scenic, scientific, and historic features. The Glen Canyon NRA is divided into four management zones: natural, recreation and resource, utilization, and cultural and development. Development zones are designated areas allowing permanent structures to be built as long as they are necessary to provide visitor services and are needed for maintenance and administrative purposes. In the GMP (NPS 1979), the Antelope Point area is designated as a Potential Development Area on the Navajo Reservation shoreline.

Existing land uses in the Antelope Point area include the following (in addition to undedicated open space):

- X Navajo Tribal park
- X recreation

- X camping
- X Navajo Generating Station water-intake facility
- X traditional Navajo religious ceremonies (discussed in the cultural resource section [3.8.1] of this document)
- X gravel pit (discussed in the geology section [3.3.2] of this document)
- X grazing on nearby lands
- X one Tribal homesite

Navajo Nation lands bordering Lake Powell are included within an established but undeveloped Tribal park (Navajo Tribal Council/Advisory Committee Resolution ACMA-35-62, March 1962). A similar, developed Tribal park at Monument Valley has recorded an average annual visitation of 100,000 persons indicating significant recreational demand on the Reservation.

The Salt River Project operates a water intake facility east of the Project area that supplies water to the Navajo Generating Station. Electrical pumps power the facility. A leased utility corridor exists between the intake station and power plant. The project maintains an improved access road from State Route 98 to the intake facility. Four miles of this road are also the main entry route to Antelope Point. Access to the pump station will continue to be required along this road.

One permanent residence on a Tribal homesite lease has been established approximately 1.5 miles south of Antelope Point. The homesite does not overlap any of the project area.

Antelope Island, which is in Glen Canyon NRA, lies only 2,400 feet across a narrow channel of the lake (once the canyon of the Colorado River) from Antelope Point. Designated a Research Natural Area by the National Park Service in 1975, the 9,000-acre island is managed for preservation in its natural state. No motorized vehicles or constructed facilities are permitted. Isolated from the mainland by rising Lake Powell in 1973, the island is considered ideal for research on the behavior of natural island populations of wildlife and vegetation. Existing uses are recreation and open spaces.

3.13.2 Population

Antelope Point is located on the Navajo Reservation and National Park Service-administered land in Coconino County, on the shore of Lake Powell in northeastern Arizona. The geographic area surrounding Antelope Point includes the City of Page, Arizona; the Lechee Chapter and other chapters of the Navajo Nation. Table 3-5 shows the existing populations of the City of Page, Navajo Nation, Coconino County, and Arizona, as well as their respective growth rates for the past 10 years.

TABLE 3-5 POPULATION BY GEOGRAPHIC AREA			
	1990	2000	Percent Change
City of Page	6,598	6,809	4
Navajo Nation (AZ, UT, NM)	148,451	180,462	21
Coconino County	96,591	116,300	17
Arizona	3,665,228	5,130,632	29
Source: U.S. Census Bureau 1990, 2000			

3.13.3 Employment

The City of Page is located approximately 7 miles southwest of Antelope Point and can be considered the gateway community to the proposed development. Lake Powell, the Navajo Generating Station, the federal government, and tourism are major contributors to the economy of Page, Arizona. Recreational properties and public utilities are the main employers in Page. According to the Arizona Department of Commerce, in 2000, the area had an average labor force of 4,331 with an average unemployment rate of 4.5 percent (194 individuals).

The estimated unemployment rate on the Navajo Nation is 44 percent (Choudhary 2000). The Antelope Point Project area is included within a designated, U.S. Department of Housing and Urban Development Enterprise Zone, which makes the area considered an economically distressed area.

3.13.4 Housing

There is currently no housing at Antelope Point. The nearest residential communities are the City of Page, Arizona and the Lechee Chapter of the Navajo Nation, located approximately four miles south of Page.

No specific information on the housing units and vacancy rates are available for the Lechee Chapter. However, the National Park Service conducted a Housing Needs Assessment for the communities of Page and Wahweap (NPS 1999). According to the assessment, “there do not seem to be any short-term, affordable, livable rentals in the local commuting area for our seasonal employees and essential cooperators” (NPS 1999). In addition, the study concluded that lack of seasonal housing (for NPS employees) would seriously affect the ability of the National Park Service to hire qualified personnel for seasonal positions, which would affect services to the visiting public (NPS 1999).

3.13.5 Recreation

The Glen Canyon NRA is a popular destination for recreationists attracted by the year-long availability of outdoor activities. Boating, river-running, camping, fishing, and package tours are the most popular activities. Backcountry camping, backpacking, and day hiking activities also

attract a significant number of visitors. A summary of visitor use at the Glen Canyon NRA is provided in Table 3-6.

TABLE 3-6 GLEN CANYON NRA VISITORS STATISTICS		
	Persons	Percent Change
Total Annual Recreation Visits in 1998	2,442,990	—
Total Annual Recreation Visits in 1999	2,639,860	+8
Total Annual Recreation Visits in 2000	2,568,111	-3
Total Annual Recreation Visits in 2001	2,363,807	-8
Source: NPS 2002		

Visitors to the area often take trips by tour boat from Wahweap to Rainbow Bridge National Monument. Visitation to Rainbow Bridge National Monument by tour boat is restricted by the National Park Service to ensure the resource values are protected. Up to 300 people per day will be allowed to visit Rainbow Bridge from Antelope Point, though visitors from Wahweap currently use this capacity.

Current recreational facilities at Antelope Point include a public launch ramp, information shelter, parking, and sanitary facilities. The dominant recreational activities are shoreline camping in recreational vehicles and campers, boating, water-skiing, swimming, bank fishing, and sunbathing. Group camping appears to be common during summer. Camping along the shoreline is currently limited to two weeks' duration under National Park Service regulations. No developed camping facilities are available on the site now. The NNPRD monitors visitor use by way of vehicles entering Antelope Point. A summary of vehicles entering Antelope Point during summer 2001, excluding employees and other non-visitor vehicles, is provided in Table 3-7.

TABLE 3-7 VISITOR VEHICLES ENTERING ANTELOPE POINT, SUMMER 2001		
Month	Vehicles¹	Daily Average
May	1,950	63
June	5,490	183
July	7,834	253
August	5,769	186
September	2,525	84
Note: ¹ Taken from total vehicles entering Antelope Point minus commercial vehicles, employees, etc.		
Source: NNPRD 2001		

3.13.6 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income

populations. The Project is located within part of the Navajo Reservation, a minority community as indicated by Table 3-8.

TABLE 3-8 NAVAJO RESERVATION POPULATION BY RACE		
Race	Number	Percent
American Indian	173,987	96.4
White	4,316	2.4
Other	2,159	1.2
Source: U.S. Census Bureau 2000		

Low-income refers to households whose income is at or below the poverty level, as defined by the U.S. Department of Health and Human Services. In 1989, the poverty level for a single individual was \$5,980; the poverty level for a family of four was \$12,100. According to 1990 Census Bureau data, income for almost 56 percent of Navajo Nation households was less than \$12,500. Thirty percent of Navajo Nation households reported incomes less than \$5,000. Based on these data, the Navajo Nation is considered a low-income community.

3.14 WASTE MANAGEMENT

Current waste management facilities at the site include two vault toilets, one portable toilet dump station, four movable micro-flush toilets, and conventional trash cans. Wastewater from vaulted toilets is collected twice annually; wastewater from the microflush toilet tanks is pumped out weekly. Solid waste removal is conducted daily in the summer and about once per week during the winter. Despite trash cans and solid waste removal at Antelope Point, trash is often found along the shoreline because monitoring of the area by the Navajo Nation and National Park Service occurs infrequently. No hazardous waste or hazardous materials are stored or generated at Antelope Point.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This section describes the anticipated effects on the natural, cultural, and human environment as described in Chapter 3, Affected Environment, that would result from construction and operation of each alternative.

4.1.1 Methodology

The environmental consequences section analyzes both beneficial and adverse impacts that could result from the alternatives. Impacts are evaluated based on context, duration, intensity, and whether they are direct, indirect, or cumulative impacts. In addition, impairment of resources and values of the Glen Canyon National Recreation Area (NRA) is considered. Impacts are evaluated based on the most current and comprehensive scientific and social data available.

All the information on impacts was not generated at Glen Canyon NRA, but certain information from other areas can be used to determine potential impacts within the NRA.

Thresholds were established for each impact topic to help understand the severity and magnitude of changes in resource conditions, both adverse and beneficial, from the various management alternatives. Each alternative is compared to a baseline to determine the context, duration, and intensity of resource impacts. The baseline, for purposes of impact analysis, is the No Action Alternative (Alternative A). Each alternative, including no action, is compared to this baseline to determine the relative change in resource conditions.

When quantitative information is available, a percentage change from the baseline is used as an indicator. When criteria are not applicable, standard definitions for the degree of change are used. In the absence of quantitative data, best professional judgment prevailed. In general, the thresholds used come from existing information on the resources, federal and state standards, and consultation with subject matter experts and appropriate agencies. The planning team then considered potential ways to mitigate effects of developing and operating a marina and resort at Antelope Point on NRA and Navajo Nation resources, and modified the alternatives accordingly.

For the purposes of analysis, the following assumptions are used for all impact topics:

Short-term impacts: Those occurring from the development and operation of Antelope Point Marina and Resort in the immediate future (disturbance/construction period and shortly thereafter).

Long-term impacts: Those occurring from the development and operation of Antelope Point Marina and Resort over several seasons of use.

Direct impacts: Those occurring as a result of the construction and operation of Antelope Point Marina and Resort project area (e.g., vegetation removal).

Indirect impacts: Those occurring from the development and operation of Antelope Point Marina and Resort that have a secondary effect of altering a resource or condition (e.g., impacts on wildlife from loss of foraging habitat due to vegetation removal).

Cumulative impacts: Those occurring from the development and operation of Antelope Point Marina and Resort, when considered in context with other site-specific, local, or regional past, present, and reasonably foreseeable actions/activities that could affect the same resources or conditions, both inside and outside the NRA and Navajo Reservation boundaries.

Study area: Each resource impact is assessed in direct relationship to those resources affected both inside and outside the Project boundary, to the extent that the impacts can be substantially traced, linked, or connected to the development and operation of Antelope Point Marina and Resort inside NRA and Navajo Reservation boundaries. Each impact topic, therefore, has a study area relative to the resource being assessed, and it is further defined in the impact methodology.

4.1.2 Cumulative Effects

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Quality Act (NEPA), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts 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 non-federal) or person undertakes such other actions” (40 Code of Federal Regulations [CFR] 1508.7). Cumulative impacts were analyzed for each alternative. Cumulative impacts are the incremental impacts on the environment resulting from adding the alternatives to other past, present, and reasonably foreseeable future actions. The discussions of cumulative impacts for each resource include impacts resulting from implementation of that alternative together with the incremental impacts from other projects. In order to determine potential cumulative impacts, it was necessary to identify other ongoing or reasonably foreseeable future projects or other actions within the Antelope Point area and, if applicable, the NRA and surrounding region, to develop a cumulative scenario. That scenario included the actions described below.

- X The National Park Service is conducting or proposing to conduct various maintenance and improvement projects in the Wahweap area. Proposed upgrades would include rehabilitation of picnic facilities and a comfort station, installation new public restrooms, and rehabilitation of the campground (including walkways, landscaping, drinking fountains, fire rings, and parking). These projects would result in localized, primarily beneficial impacts on several resources, but would not be anticipated to generate cumulative impacts in combination with any of the alternatives presented for the Antelope Point Project site because Wahweap is located more than 3 miles away, farther if traveling on Lake Powell. Therefore, this project is not further considered in the cumulative scenario.
- X The National Park Service will be developing restrooms and a recreational vehicle (RV) dump station, and paving an existing road (1 mile) and parking area (about 8,000 square feet) at Lone Rock beach. These facilities will accommodate area visitors and protect

surface-water quality from potential waste contamination. Asphalt paving of the road and parking area will ensure a safe and accessible route for pedestrian and vehicle circulation, and help maintain proper drainage for that area. These improvement projects would result in localized and primarily beneficial impacts on various resources, but would not be anticipated to generate cumulative impacts in combination with any of the alternatives presented for the Antelope Point Project site because Lone Rock beach is fairly distant from Antelope Point. Therefore, this project is not further considered in the cumulative scenario.

- X The National Park Service is conducting a ‘test’ initiative to determine the successfulness of providing additional staffing and supplies to man public boat pump-outs, provide pumping services to backcountry restroom facilities and provide education to park visitors as to the importance of protecting and improving water quality at Lake Powell. Staffing would be provided at Wahweap, Stateline, and Dangling Rope to assist boaters with docking, educate boaters on sewage pumping procedures, and provide information about other pump-out locations. This project is anticipated to improve overall surface-water quality on Lake Powell, resulting in short-term and beneficial impacts on water quality, which could become long-term, beneficial impacts if the additional staffing and supplies are maintained beyond the ‘test’ initiative. Therefore, this project and its potential impacts on water quality are considered in the cumulative scenario.
- X The National Park Service continues to implement the Lake Powell Clean Water Program. Current proposals for the program include the addition of two new floating restrooms/pump-outs on the lake. Facilities would be located in Padre Bay and Good Hope Bay areas. If these were implemented, long-term and beneficial impacts on surface-water quality would be anticipated. Therefore, this project and its potential impacts on water quality are considered in the cumulative scenario.
- X The National Park Service is proposing to upgrade the existing wastewater treatment system at Wahweap. This project is necessary to bring the current wastewater treatment system into compliance with Arizona Department of Environmental Quality (ADEQ) and Environmental Protection Agency (EPA) requirements. The National Park Service is considering two alternatives for this project, which generally include: (1) modifying the existing facilities and implementing constructed wetlands with disposal of treated effluent into new percolation basins and evaporation ponds; or, (2) the piping of wastewater to Page, Arizona for treatment and disposal. The upgrades would reduce current adverse impacts on water quality, resulting in long-term, beneficial impacts on surface-water quality of Lake Powell, particularly in the areas near Wahweap. The option to utilize the WWTP at Page for treatment and disposal may diminish the capacity of the Page WWTP to accept wastewater from other sources. Therefore, this project and its potential impacts on water quality are considered in the cumulative scenario.
- X The National Park Service has proposed to develop a Lakewide Housing Master Plan to plan for the upgrading of concessioner employee trailer housing to permanent structures over a ten-year period. The first two areas to be studied would be Wahweap and Hall’s Crossing. Though the study itself would not result in any adverse impacts on resources,

additional housing, if implemented would increase regional housing opportunities for concession employees. Construction and operation of housing would likely result in localized, short- and long-term, and adverse impacts to air quality, geology and soils, water quality, and natural soundscapes, but there also would be a long-term, beneficial impact to regional socioeconomic conditions from construction jobs, to improved housing availability. Therefore, this project and its potential impacts on regional socioeconomic conditions are considered in the cumulative scenario.

- X The National Park Service is conducting improvements to the launch ramp, roads, and parking area at Antelope Point. The public boat ramp recently has been extended, as a result of lowered lake levels, to accommodate park visitors launching and retrieving watercraft. This project included minor rock excavation and placement and compaction of fill. The Antelope Point road and parking area paving have been planned since 1995. Paving of the main entry road has already occurred; paving and development of a curb and gutter for the gravel parking area is scheduled for Spring 2002. The parking area will be paved with asphalt, limiting erosion of soils and sedimentation of surface waters. Together these improvements at Antelope Point will increase accessibility of the lake to visitors, which could increase visitation to the area. Therefore, this project and its potential impacts are considered in the cumulative scenario.
- X Navajo Nation Parks and Recreation Department (NNPRD) road and entrance improvements to Upper Antelope Canyon (0.25 mile). The road and entrance improvements being undertaken by the Navajo Nation include a new fee station and road turn-off for Antelope Canyon. The new road turn-off would be built to replace the existing road turn-off because the existing turn-off is too close to a bridge, causing safety issues. This new section of road would be less than 1 mile long, but would generally improve transportation and traffic, and provide better access to areas near Antelope Point. Therefore, this project and its potential impacts are considered in the cumulative scenario.

4.1.3 Impairment Analysis

The National Park Service (NPS) is prohibited from impairing park (including NRA) resources and values by the National Park Service Organic Act. The NPS *Management Policies 2001* (section 1.4.5) state “an impairment...is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.” Impairment of NRA resources and values has been analyzed within this document. An impact would be more likely to constitute an impairment to the extent that it effects a resource or value whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the NRA; is the key to the natural or cultural integrity of the NRA or to opportunities for enjoyment of the NRA; or is identified as a goal in the NRA’s general management plan or other relevant National Park Service planning documents. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot be reasonably further mitigated, of an action necessary to preserve or restore the integrity of NRA resources or values.

In addition, *Management Policies 2001* state, “whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.”

The determination of impairment is closely tied to the outcome of the resource impact analysis. This determination is also made with a parallel consideration of the NRA’s legislative mandates (purpose and significance), and resource management objectives as defined in the NRA’s *General Management Plan*, *Strategic Management Plan*, and *1986 Antelope Point Development Concept Plan/Environmental Assessment (DCP/EA)*.

An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is as follows:

- X necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the NRA
- X key to the natural or cultural integrity of the NRA or to opportunities for enjoyment of the NRA
- X identified as a goal in the NRA’s general management plan or other relevant National Park Service planning documents

Impairment may result from National Park Service activities in managing the NRA, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the NRA. A determination on impairment is made for each potential impact topic in this section of the EA.

4.1.4 Criteria and Thresholds for Impact Analyses

The following sections of Chapter 4 provide a description of the related laws, regulations, and policies for each impact topic, and the methodology and thresholds used in the impact analysis. Similar methodologies and criteria were used for many impact topics.

Certain impacts, such as visitor safety, are difficult to determine, and criteria have been developed through the visitor use and carrying capacity surveys that have been conducted within the recreation area.

4.2 AIR QUALITY

4.2.1 Laws, Regulations, and Policies

Air pollution sources within parks must comply with all federal, state, and local regulations. The Clean Air Act (CAA) established National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare from air pollution. The CAA also established the Prevention of Significant Deterioration (PSD) of Air Quality program to protect the air in relatively clean areas. One purpose of the PSD program is to preserve, protect, and enhance the air quality in

national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value. (42 U.S.C. 7401 et seq.). The PSD provisions also include a classification approach for controlling air pollution. Class I areas are afforded the greatest degree of air quality protection. Very little deterioration of air quality is allowed in these areas. Class I areas include international parks, national wilderness areas and national memorial parks in excess of 5,000 acres, and national parks in excess of 6,000 acres that were in existence as of August 7, 1977, when the CAA was amended. Currently, there are 48 areas in the National Park Service system designated as Class I. Under the PSD program, the recreation area superintendent is given an affirmative responsibility to protect visibility and all other Class I area air quality related values (AQRVs) from the adverse effects of air pollution. Furthermore, the CAA established a national goal of preventing any future, and remedying any existing, human-made visibility impairment in Class I areas. National Park Service areas that are not designated Class I are Class II, and the CAA allows only moderate air quality deterioration in these areas. In no case, however, may pollution concentrations violate any of the NAAQS.

Glen Canyon NRA is designated as a Class II Air Quality area under the Clean Air Act. The main purpose of this act is to protect and enhance the nation's air quality to promote the public health and welfare. The act establishes specific programs to provide protection for air resources and values, including the program to prevent significant deterioration of air quality in clean air regions of the country. Although Glen Canyon NRA is designated as a Class II air quality area, the NRA strives to maintain the highest air quality standards, and project work within the recreation area is completed in accordance with regional standards. However, the recreation area does not possess sufficient autonomous authority to address issues of air quality improvements when air pollution originates outside the boundaries.

NPS Management Policies 2001 (section 4.7) direct parks (and NRAs) to seek to perpetuate the best possible air quality to preserve natural and cultural resources, sustain visitor enjoyment, human health, and preserve scenic vistas. NRAs are directed to comply with all federal, state, and local air quality regulations and permitting requirements. *NPS Management Policies 2001* states that the National Park Service will assume an aggressive role in promoting and pursuing measures to protect AQRVs from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on NRA resources, the National Park Service "will err on the side of protecting air quality and related values for future generations."

The Organic Act and *NPS Management Policies 2001* apply equally to all National Park Service-managed areas, regardless of CAA designation. Therefore, the National Park Service will protect resources at both Class I and Class II designated units. Furthermore, the National Park Service Organic Act and *NPS Management Policies 2001* provide additional protection from that afforded by the CAA's NAAQS alone because National Park Service has documented that specific park AQRVs can be adversely affected at levels below the NAAQS or by pollutants for which no NAAQS exist.

Conformity Requirements

National Park Service areas that do not meet the NAAQS or whose resources are already being adversely affected by current ambient levels require a greater degree of consideration and scrutiny by National Park Service managers. Areas that do not meet the NAAQS for any pollutant are designated as non-attainment areas. Section 176 of the CAA states that no department, agency, or instrumentality of the federal government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to a state implementation plan. The assurance of conformity to such a plan shall be an affirmative responsibility of the head of such department, agency or instrumentality.

Essentially, federal agencies must ensure that any action taken does not interfere with a state's plan to attain and maintain the NAAQS in designated non-attainment areas. In making decisions regarding any major action within a designated non-attainment area, park managers should discuss their plans with the appropriate state air pollution control agency to determine the applicability of conformity requirements.

4.2.2 Impact Indicators, Criteria, and Methodology

Information from literature and the Navajo Generating Station was used to assess probable impacts to air quality. Local ambient air quality data from monitoring sites nearby the recreation area were reviewed. The occurrence of any exceedances (where applicable) and the level and frequency of pollutant concentrations were ascertained. Current conditions were assessed from regional data. The impact topic analyzed focused on the impacts to air quality related values and human health (e.g., visibility, smell) from airborne pollutants related to construction activities and operation of Antelope Point Marina. Impact thresholds may be qualitative (e.g., photos of degraded visibility) or quantitative (e.g., AQRV-impact based, federal air quality standard based, or emissions based), depending on what type of information is appropriate or available. There are five impact categories relevant to air quality issues: negligible, minor, moderate, major and impairment. Each category is discussed below relative to potential airborne pollution impacts from the alternatives on NRA resources and human health.

Negligible: There is no smell of exhaust and no visible smoke. Dust from construction activities can be controlled by mitigation. Ambient air quality concentrations would not be anticipated to exceed the allowable CAA Class II increment levels.

Minor: There is a slight smell of exhaust and smoke is visible during brief periods of time. Dust from use the dirt roads is visible during brief periods. Dust from construction activities is visible only during the work period and can be easily mitigated. Ambient air quality concentrations would not be anticipated to exceed the allowable CAA Class II increment levels.

Moderate: Gasoline fumes and exhaust are easily detectable in high-use areas. Smoke is visible during periods of high use. Dust from the use of dirt roads or from construction activities is visible over a large area and for extended periods of time. Mitigation is possible but is only partially effective. Ambient air quality concentrations would not be anticipated to exceed the allowable CAA Class II increment levels.

Major: Smoke and gasoline fumes are easily detectable for extended periods of time over large areas. Dust from the use of dirt roads and construction activities is visible for an extended amount of time and mitigation is unable to alleviate impacts. Ambient air quality concentrations equal or occasionally exceed allowable CAA Class II increment standards.

Impairment: Air emissions would exceed standards, and air quality in the NRA would be adversely affected to the point that the purpose of the recreation area could not be fulfilled, and NRA resources could not be experienced and enjoyed by future generations.

4.2.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be developed, and air quality in areas up to approximately 3 miles away from the Project sites would be expected to remain as it is today. Continued visitor use of the area for camping, boating (motorized), and occasional use by off-highway vehicles (OHV) would result in periodic emissions of air contaminants from fires and internal combustion engines on cars, boats, and other motorcraft. These would represent negligible adverse impacts on the local area that would continue on a long-term basis.

Cumulative Effects

The area of influence for assessment of cumulative effects on air quality was defined as the area within approximately 3 miles of the Project site. No development would occur at Antelope Point with implementation of the No Action Alternative (Alternative A) and cumulative effects would consist of those resulting from current use of the area, in conjunction with the parking area paving and road improvements in the area. These actions in combination with Alternative A would have a long-term, negligible, and adverse effect on air quality in the Antelope Point area.

Conclusion

Alternative A would create long-term, negligible, adverse impacts on air quality from continued recreational uses, including emissions from cars, campers, and boats. No impairment of air quality would result from implementation of this alternative.

4.2.4 Alternative B (Proposal)

Impact Analysis

Two sources of air pollution would be anticipated to occur during the construction phase of the Project, as proposed under this alternative: (1) fugitive dust (i.e., particulate matter of different sizes [PM₁₀ and PM_{2.5}]) generated by ground-clearing operations and/or movement of vehicles and (2) gaseous air pollutants from the use of vehicles and other fuel-burning equipment. These increases would be considered temporary, negligible-to-minor adverse impacts on air quality, with impacts limited to the localized dust and emissions generated during ground-disturbing activities. Additionally, the following specific mitigation measures would be implemented to further reduce impacts:

- X All construction equipment would be maintained properly in optimal running condition to minimize emission from construction equipment;
- X Grading and excavation activities would be limited to immediate building areas and the 50 feet surrounding those areas, except for utility trenching (Hudgins 2001); and
- X Any construction areas left exposed would be watered twice daily to reduce fugitive dust.

When operational, Alternative B would contribute air pollutants from visitor automobiles, trucks, houseboats, powerboats, and other watercraft. These sources would not be anticipated to generate more than 100 tons of criteria pollutants annually. In addition, Antelope Point is not located in a non-attainment area. Ambient air quality is well below the federal limits for each criterion pollutant monitored (Table 3-1), and increases would likely be minimal. The wastewater treatment plant (WWTP) also would produce some gaseous emissions, but these would be a minimal contribution to the overall Project emissions. Therefore, the development would not be considered a major source and impacts on air quality from operations would be negligible to minor and adverse, continuing over the long-term period of operation.

Cumulative Effects

Cumulative impacts would result from the combination of construction and operation of the marina and associated facilities, plus the addition of contaminants (e.g., exhaust from paving equipment) from the proposed parking improvements. Impacts on air quality would be short-term, negligible-to-minor, adverse, and local impact. Long-term cumulative impacts would result from continued use of the area by cars, boats, and other motorcraft and would be negligible to minor and adverse.

Conclusion

Alternative B would create both short-term and long-term, negligible-to-minor, adverse impacts on air quality, from construction dust and gaseous emissions, increased recreational use of the area, and operation of the WWTP. No impairment of air quality would result from implementation of this alternative.

4.2.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts on air quality resulting from construction of Alternative C would be similar to those described for Alternative B (short term, negligible to minor, and adverse). Likewise, operations impacts resulting from Alternative C would be the similar to those described for Alternative B (long term, negligible to minor, and adverse). Instead of WWTP emissions, a marginal increase to vehicle emissions would occur from trucking the waste to Page, Arizona for treatment and disposal. Mitigation measures listed for Alternative B also would be implemented under Alternative C.

Cumulative Effects

Cumulative effects associated with Alternative C would be the same as those described for Alternative B (i.e., long-term, negligible-to-minor, adverse impacts from use of the area by motorized vehicles and watercraft).

Conclusion

Alternative C would create both short-term and long-term, negligible-to-minor, adverse impacts on air quality, similar to Alternative B, but with more effects from wastewater trucks and less from wastewater lagoons. No impairment of air quality would result from implementation of this alternative.

4.3 GEOLOGY AND SOILS

4.3.1 Laws, Regulations, and Policies

NPS *Management Policies 2001* (section 4.8) stipulates that the National Park Service will preserve and protect geologic resources as integral components of park natural systems. Geologic resources include geologic features and geologic processes. The fundamental policy, as stated in the National Park Service Natural Resources Management Guideline (NPS-77) is the preservation of the geologic resources of parks in their natural condition whenever possible.

Preventing or minimizing adverse, potentially irreversible impacts on soils, in accordance with NPS *Management Policies 2001*, will protect soil resources. NPS-77 specified objectives for each management zone for soil resources management. Zones within the recreation area have been designated in the Glen Canyon NRA General Management Plan (GMP), which provides the overall guidance and management direction for Glen Canyon NRA.

4.3.2 Impact Indicators, Criteria, and Methodology

The impact assessment for geology and soils focused on effects the alternatives would have on geologic processes, including the formation and conservation of soil resources within 1 mile of the Antelope Point Project site. Actions prescribed for the Project could affect soil resources through accelerated erosion, soil loss, or soil removal. The analysis was conducted by examining the types of soils and amount of area that would be disturbed or paved and applying knowledge of expected effects under each alternative, based on professional judgment and past experience with similar projects. The following definitions were used to assess the intensity of impact:

Negligible: Soils or geologic features would not be affected or if affected would not be measurable. Any effects on soil productivity or fertility would be slight, short-term, and would occur in a relatively small area.

Minor: The effects on soils or geologic features would be detectable, but likely short-term. Effects on soil productivity or fertility would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: The effects on soil or geologic features would be readily apparent, long-term, and slightly changes the soil or geologic characteristics over a relatively large area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: The effect on soil or geologic features would be readily apparent, long-term, and substantially change the soil or geologic characteristics over a large area in and out of the NRA. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

Impairment: The effects would cause a permanent change in a large portion of the overall acreage of the NRA, affecting the resource to the point that the NRA's purpose could not be fulfilled and the resource would be degraded precluding the enjoyment of future generations.

4.3.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be developed. No change to geology or soils would occur; however, long-term, negligible-to-minor, adverse impacts would continue to result from erosion caused by camping and vehicle use at the Antelope Point site.

Cumulative Effects

The area of influence for the analysis of cumulative effects was defined as the area within 1 mile of the Project. Cumulative effects in this area under Alternative A would consist of the loss of soil from erosion due to the continued use of the Project area by vehicles and campers, plus the loss of soil and soil productivity from the paving and surface disturbance associated with the two road/entrance improvement projects. Because very few acres have been paved, and the areas that were paved or disturbed were mainly rocky sites with poor soils, these represent long-term, adverse, minor impacts on area geologic processes and soil resources.

Conclusion

Alternative A would result in long-term, negligible-to-minor, adverse impacts on geologic and soil resources due to the continued surface disturbance from use of the area by campers and vehicles. No impairment of geologic and soil resources would result from implementation of this alternative.

4.3.4 Alternative B (Proposal)

Impact Analysis

Soils disturbed during construction of Alternative B (on approximately 139 to 144 acres) would be subject to wind erosion unless they are stabilized by reclamation. A majority of the disturbed area would be developed or paved, and remaining areas would be revegetated after construction activities are completed. Grading activities would be limited to immediate building and/or development areas (except for utility trenching), and exposed areas would be watered to reduce

dust during construction, resulting in negligible amounts of soil loss. For areas disturbed by construction but not permanently paved or used as building sites, impacts on soils would be localized, short term, minor, and adverse. Many of the areas slated for permanent structures or parking involve use of areas that are rocky and have shallow soils and/or poor soil productivity. These rocky areas may have to be leveled in limited areas to permit construction of building foundations or other facilities, but long-term, adverse impacts on soils would be minor to moderate at most. With proper reclamation procedures and monitoring, impacts should be kept to a minor level.

Areas of shallow soil at Antelope Point have little capacity to absorb runoff. This factor, in combination with the addition of impervious parking lots and other hard surfaces, could lead to soil loss through erosion and consequent sedimentation. Runoff and drainage from the area would be controlled by designing facilities to limit erosion. Impacts on local soils from this erosion would be considered long term, negligible to minor, and adverse.

Surface materials at the gravel pit would change because the gravel pit area would become the location of the hotel and cultural center proposed in Alternative B. Development of the hotel and cultural center would preclude future gravel mining at this location, which has been abandoned for several years. This effect would be long term, minor, and beneficial, as a result of reclaiming the knoll, covering the existing open pit scar, and eliminating soil erosion potential from this area. Although there are clay lenses present through the alluvial deposit profile at the knoll, buildings would be designed and engineered to withstand any potential shifting of these clay lenses.

Development of new facilities at Antelope Point would result in higher concentrations of visitors and greater use of the shoreline areas. As more people walk over the rock surfaces, the sharpness of the differentially eroded crossbedding could be reduced over a period of years, diminishing the quality of an attractive natural geologic feature of the site. The establishment of trails through the area, as proposed, would mitigate this potential impact. This increased usage, however, would still result in long-term, negligible, adverse impacts on the shoreline areas at Antelope Point.

Boats traveling through the channel to and from the marina would have an effect on soils along the shoreline in that area. The erosion of shoreline soils would be controlled by a combination of management measures (i.e., a no-wake zone and/or breakwaters) that would be implemented at prescribed lake water levels. Implementation of these management measures would reduce erosion along the shoreline over the life of the Project and would reduce long-term, adverse impacts to minor levels.

Cumulative Effects

Cumulative effects in this area under Alternative B would include the loss of soil from areas that are paved or from erosion due to the construction and use of the Project area, plus the loss of soil and soil productivity from the paving and surface disturbance associated with the road and parking improvement projects. However, most of the acres that have been or would be paved or used for building contain poor quality or thin soils, or are part of the on-site gravel pit, thereby

limiting loss of productive soils and eliminating the current erosion from the pit area. Overall, cumulative impacts on geology and soil resources would be long term, adverse, and minor.

Conclusion

Alternative B would result in both short-term and long-term, minor, adverse impacts on geologic and soil resources, due to the disturbance from construction activities and the long-term use of the area by visitors and vehicles, plus the permanent loss of a small amount of productive soil resources for paved areas and buildings. No impairment of geologic and soil resources would result from implementation of this alternative.

4.3.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts resulting from construction and operation of the Preferred Alternative (Alternative C) would be similar to those described for Alternative B. However, if trucking wastewater to Page, Arizona were the option implemented, the disturbance area would be approximately 128 acres, which is 11 to 16 acres less than what would be disturbed under Alternative B. If employee housing and an on-site WWTP option were implemented, the disturbance area would increase by approximately 13 acres, compared to Alternative B. Overall, impacts on geology and soils would be comparable to those impacts described for Alternative B (short term and long term, minor, and adverse).

Cumulative Effects

Cumulative effects under Alternative C would be similar to those described for Alternative B, with the exact amount of area disturbed depending on the final project design. There would be loss of soil from areas that are paved or from erosion due to the construction and use of the Project area, plus the loss of soil and soil productivity from the paving and surface disturbance associated with the road and parking improvement projects. However, most of the acres that have been or would be paved or used for building contain poor quality or thin soils, or are part of the on-site gravel pit, thereby limiting loss of productive soils and eliminating the current erosion from the pit area. Overall, cumulative impacts on geology and soil resources would be long term, adverse, and minor.

Conclusion

Alternative C would result in both short-term and long-term, minor, adverse impacts on geology and soil resources, due to the disturbance from construction activities and the long-term use of the area by visitors and vehicles, plus the permanent loss of a small amount of productive soil resources for paved areas and buildings. No impairment of geology and soil resources would result from implementation of this alternative.

4.4 WATER RESOURCES

4.4.1 Laws, Regulations, and Policies

The Clean Water Act, and supporting criteria and standards promulgated by the EPA, the Utah Department of Environmental Protection (UDEP), and ADEQ are used at Glen Canyon NRA to protect the beneficial uses of water quality, including human health, health of the aquatic ecosystem, and recreational use.

A primary means for protecting water quality under the Clean Water Act is the establishment, implementation, and enforcement of water quality standards. Generally, the federal government has delegated the development of standards to the individual states subject to EPA approval. Water quality standards consist of three components: (1) the designated beneficial uses of a water body, such as aquatic life, cold water fishery, or body contact recreation (i.e., swimming or wading); (2) the numerical or narrative criteria that define the limits of physical, chemical, and biological characteristics of water that are sufficient to protect the beneficial uses; and (3) an anti-degradation provision to protect the existing uses and quality of water.

Water quality criteria developed to protect specific uses are updated periodically by the EPA. New and revised criteria are published in the *Federal Register*, and summarized periodically in Quality Criteria for Water (U.S. EPA 1986). Quality Criteria for Water, also known as "the Gold Book," recommends criteria for a state's Water Quality Standards. The criteria are almost always adopted by states as a portion of their standards, and they represent the "minimum" level of protection afforded to the waterbodies of a state.

A state's anti-degradation policy is a three-tiered approach for maintaining and protecting various levels of water quality. Pertaining to Tier 1 waters, the existing uses of a water body and the quality necessary to protect the uses must be maintained. This is considered to be the base level of protection that must be applied to the water body. If the water quality in a water body already exceeds the minimum requirements for the protection of the designated uses (Tier 2), then the existing water quality must be maintained. The third tier provides protection for the state's highest quality waters or where ordinary use classification may not suffice; these water bodies are Tier 3 waters and are classified as Outstanding National Resource Waters. The existing water quality must be maintained and protected in an Outstanding National Resource Waters. Lake Powell is a Class 1 waterbody.

Water quality standards are primarily obtained by controlling the pollutants permitted in point source discharges of pollutants into receiving waters through Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES) permits, the implementation of best management practices for non-point sources of pollution, and the implementation of Clean Water Act Section 303d, total maximum daily loads (TMDL's), on water bodies that have chronic and persistent violations of water quality standards. The objective of a TMDL is to allocate allowable pollutant loads among different point and non-point sources of pollution.

Maximum contaminant levels for drinking water are developed under the Safe Drinking Water Act. The EPA periodically updates these National Primary Drinking Water Regulations; states

have primary enforcement responsibility. New and revised standards are published in the *Federal Register*. These standards are applicable to finished drinking water that has undergone treatment processes.

4.4.2 Impact Indicators, Criteria, and Methodology

The best available information from the most recent literature was used to develop the impact section. Scientists and specialists from within and outside the National Park Service were consulted. Dilution is also a consideration. The volume of water in Lake Powell is 27 million acre-feet at full pool. Impacts can be evaluated based on the potential for dilution lakewide and in coves where use is concentrated. Section 304(a)(1) of the Clean Water Act requires the EPA to develop and publish criteria for water quality accurately reflecting the latest scientific knowledge. Water quality criteria developed under section 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. If no criteria are listed for a pollutant, the EPA does not have any national recommended water quality criteria.

The following impact thresholds were established in order to describe the relative changes in water quality (both overall, localized, short, long-term, cumulatively, adverse, and beneficial), under the various management alternatives, when compared to baseline conditions. Impacts were considered for areas up to 3 miles from Antelope Point.

Negligible: Impacts would not be detectable. Water quality parameters would be well below all water quality standards for the designated use. Both quality and flows would be within historical ambient and variability conditions.

Minor: Impacts would be detectable, but water quality parameters would be well below all water quality standards for the designated use. Both quality and flows would be within the range of ambient conditions, but measurable changes from historical norms would occur. State water quality antidegradation policy would not be violated.

Moderate: Changes to water quality or flows would be readily apparent, but water quality parameters would be below all water quality standards for the designated use. Water quality or flows would be outside of the range of ambient conditions. Mitigation would probably be necessary to offset adverse effects and would likely be successful. State water quality antidegradation policy would not be violated.

Major: Changes to water quality or flows would be readily apparent, and some water quality parameters periodically would be approached, equaled, or exceeded. Flows would be outside of the range of ambient conditions, and could include a complete loss of water in some areas or flooding in other areas. Extensive mitigation would be needed to offset adverse effects, and its success would not be assured. State water quality antidegradation policy may be violated.

Impairment: Waters routinely exceed state-established water quality numeric standards for the designated use, or the state antidegradation policy is violated.

The analysis identified potential effects on water resources, including both surface water and groundwater, associated with both construction and operations of the proposed Project. Information on water resources in the area was gathered from National Park Service and the Navajo Nation Department of Water Resources. Actions under the various alternatives were evaluated based on the current conditions of surface water and groundwater in the area, the amount of contaminants/pollutants expected to occur to surface water, and the amount of groundwater expected to be extracted and consumed. Impacts were assessed based on professional judgment and past experience with similar projects.

4.4.3 Alternative A (No Action Alternative)

Impact Analysis

Surface Water

Under the No Action Alternative, impacts on surface water quality would occur as a result of continued vehicle use, camping along the shoreline, and use of watercraft from the public launch ramp. These impacts would be negligible, adverse, and long term.

Groundwater

Groundwater for the resort and marina would not be developed and groundwater would not be used for drinking water. No impact on groundwater quantities would be anticipated.

Cumulative Effects

Surface Water

The area of analysis for cumulative impacts on surface water quality included the waters of Lake Powell within approximately 3 miles from Antelope Point. Cumulative impacts that would occur under Alternative A would be long-term, negligible, and adverse on surface-water quality resulting from increased access to the area from transportation and parking improvements. Impacts on surface water also would occur from continued uses along the shoreline and from the watercraft launched into the lake from Antelope Point. Negligible-to-minor, long-term, and beneficial impacts on surface-water quality would be expected from the National Park Service initiative to staff pump-outs and continued implementation the Lake Powell Clean Water Program. In addition, National Park Service will install new catch basins at Antelope Point to control storm water. Upgrades to the Wahweap wastewater treatment system would be anticipated to result in long-term, moderate-to-major, beneficial impacts on water quality, by bringing the system into compliance with state and federal regulations. Overall impacts on surface-water quality would likely be long term and beneficial.

Groundwater

The area of analysis for cumulative impacts on groundwater resources included the Antelope Point Project site (950 acres) and areas within 0.5 mile (which includes the Project wells on Navajo Nation lands). No groundwater would be extracted for the road improvements proposed

by the National Park Service or Navajo Nation. As no groundwater would be extracted or consumed at Antelope Point, no cumulative impacts would be anticipated.

Conclusion

Alternative A would result in long-term, negligible, adverse impacts on surface water quality because of continued camping and use of watercraft near Antelope Point. No impacts on groundwater would be anticipated. No impairment of surface water or groundwater would result from implementation of this alternative.

4.4.4 Alternative B (Proposal)

Impact Analysis

Surface Water

Construction of Alternative B would result in temporary surface disturbance of up to approximately 139 to 144 acres within Antelope Point. Short-term, low-level increases in sedimentation rates along the Lake Powell shoreline would result from erosion of disturbed areas. Sediment accumulation would be expected to be negligible during construction, particularly if surface stabilization techniques are employed effectively. Erosion of soil into lake waters would be expected to decline to current background levels after disturbed areas have been paved or rehabilitated. A Construction General Permit under the National Pollutant Discharge Elimination System would be acquired, which would outline specific best management practices that would be implemented to reduce any potential stormwater runoff. Therefore, these localized impacts would be short term, negligible, and adverse.

Development of Alternative B would result in the installation and operation of sewage-treatment facilities, fuel-storage tanks, and storage tanks for waste oils and fuels in a new area in proximity to Lake Powell. Leaks, seepage, storm-induced washout of containment structures, or careless operating practices could result in contamination of lake waters. To mitigate such potential impacts, the sewage-treatment facility and hazardous-materials storage would be designed to isolate possible effluents from surface water. Methods used would include substrate sealing, drainage control, and provision of surface-containment structures. A NPDES permit would not be required for operations at Antelope Point, as no discharges to the lake or other surface waters are proposed. Although some on-going risk to surface water would occur, the mitigation measures and contingency plans for spills from fuel-storage tanks, and waste-oil and fuel-storage tanks would reduce expected adverse impacts to minor levels.

Operational effects of Alternative B could include a variety of effects on water quality at shoreline camping points on Antelope Point and elsewhere along the Lake Powell shoreline. Although contamination of lake waters by human waste has not been documented at Antelope Point, the area has not been monitored adequately for contamination under the current regime of camping and day use. However, observed accumulation of wastes along the shoreline leads to a presumption that contamination by human wastes could occur on the heavily used campsite and beach areas. Implementation of Alternative B would result in developed, managed, and

monitored camping facilities and toilets at Antelope Point. Human waste from toilets would be collected and pumped to the WWTP to be built as part of Alternative B. It is expected, therefore, that the potential for contamination of lake waters at Antelope Point would be reduced because of the facilities development, despite an increase in visitors to the area, resulting in permanent, beneficial, and minor impact on water quality.

Boat pump-out stations at the marina would be a potential source of contamination by sewage waste from boat holding tanks. Properly designed pump-out facilities and hose couplings would minimize the potential for contamination. Antelope Point would be incorporated into federal, Tribal, and state hazardous spill contingency planning to provide for rapid containment and cleanup in the event of a spill. Based on the protective features included in design of the boat pump-out stations, impacts on water quality would be long term, negligible to minor, and adverse.

Alternative B would result in increased watercraft in the waters of Lake Powell at Antelope Point because of the 470 slips that would be available at the marina and the operation of a second launch ramp. The watercraft would emit mixtures of hydrocarbons into lake waters. The anticipated concentrations of these emissions in the water would not be anticipated to reach or exceed water quality standards or regulatory criteria because the large size and water currents associated with Lake Powell would dilute any pollutant concentrations, and EPA is requiring the phasing in of less polluting marine engines over the next decade (EPA 1996, 1997). Therefore, impacts on surface-water quality from watercraft would be long term, minor, and adverse.

Groundwater

Under Alternative B, groundwater would be withdrawn from bank storage supplies in the Navajo sandstone in sufficient quantities to fill storage tanks at the site (225,000 gallons) and supply daily water requirements of the development (approximately 70,000 to 82,000 gallons per day [gpd]). Preliminary tests indicate that the on-site wells have sufficient capacity to supply the Project with water. A permit would be acquired from the Navajo Nation Department of Water Resources consistent with the water needs of the Project. Impacts on groundwater resources would be long term, negligible to minor, and adverse.

In addition, porous sandstone substrates at the site make groundwater vulnerable to contamination from the sources that could contaminate surface waters (e.g., wastewater). To mitigate such potential impacts, the WWTP and hazardous-materials storage would be designed to isolate possible effluents from groundwater. Methods used would include substrate sealing, drainage control, and provision of surface-containment structures. Although some long-term risk to groundwater would occur, the mitigation measures and contingency plans for spills from fuel-storage tanks, and waste-oil and fuel-storage tanks would reduce expected adverse impacts to minor levels.

Cumulative Effects

Surface Water

Cumulative impacts on surface water that would occur under Alternative B would result from the impacts associated with the Project, as previously described, plus the increased storm water runoff from impervious paved areas from the other projects. These impacts would add to the runoff from the Project alone, resulting in long-term, minor, and adverse impacts on surface-water quality. However, the long-term and beneficial impacts on surface-water quality that would be expected from the National Park Service initiative to staff pump-outs, continued implementation the Lake Powell Clean Water Program, and upgrades to the Wahweap wastewater treatment system may partially offset adverse impacts.

Groundwater

Cumulative impacts on groundwater would include extraction of water from the on-site wells and potential risks of contamination from wastewater, waste oil, and fuel-storage tanks leaking. The other projects in the area have or would have no discernable groundwater impacts. Therefore, cumulative impacts would be long term, minor, and adverse.

Conclusion

Alternative B would result in short-term, negligible, and adverse impacts on surface-water quality from runoff during construction. Long-term, negligible-to-minor, adverse impacts on surface-water quality would occur from potential leaks in fuel tanks and wastewater lagoons and from the additional boat use expected. However, beneficial, long-term, and minor impacts would occur from installation of toilets and curtailing waste along the shoreline that contaminates surface water. No impairment of surface water would result from implementation of this alternative.

Impacts on groundwater quantities would be long term, negligible to minor, and adverse based on the ability of the on-site wells to provide the water needed for the Project. Impacts on groundwater quality would be long term, minor, and adverse based on the risk of contamination from leaking wastewater lagoons and fuel storage tanks. No impairment of groundwater would result from implementation of this alternative.

4.4.5 Alternative C (Preferred Alternative)

Impact Analysis

Surface Water

Impacts resulting from construction and operation of Alternative C would be similar to those described for Alternative B, assuming the WWTP option for Alternative C was developed. However, Alternative C proposes hauling wastewater by truck to Page, Arizona for disposal rather than develop a WWTP. The trucking option would eliminate the need for open evaporation ponds, but would require storage tanks for wastewater. This option would reduce

potential impacts from contamination due to leaks or storm-induced washouts of the evaporation ponds. Alternative C, with the trucking option, would have long-term, minor, adverse impacts on water quality.

Fewer boat slips (420 total) would be provided under Alternative C, reducing the expected hydrocarbon emissions from watercraft into Lake Powell. The anticipated concentrations of these emissions in the water would not be anticipated to reach or exceed water-quality standards or regulatory criteria because the large size and water currents associated with Lake Powell would dilute any pollutant concentrations. Therefore, impacts on surface-water quality from watercraft would be long term, minor, and adverse.

Groundwater

Impacts resulting from construction and operation of Alternative C would be similar to those described for Alternative B. However, assuming that employee housing and hotel laundry/linen services would be located off site, fewer gallons of water would be needed for operations. Approximately 53,000 gpd would be required for Alternative C, resulting in less demand for water. This reduction in water demand would result in marginally less impact on water quality, but impacts would remain long term, adverse, and negligible to minor.

Cumulative Effects

Surface Water

Similar to Alternative B, additional impacts on surface water would occur under Alternative C from increased stormwater runoff from impervious paved areas related to the other projects, the National Park Service initiative to staff pump-outs, continued implementation the Lake Powell Clean Water Program, and upgrades to the Wahweap wastewater treatment system. These impacts, together with the expected effects from the Project alone, would result in long-term, minor, and adverse impacts on surface water quality.

Additionally, if the trucking option were implemented for this alternative and the piping wastewater to Page were selected for treatment and disposal of Wahweap wastewater, cumulative impacts may occur related to the capacity of the Page WWTP to accept wastes from both areas. The capacity of the Page WWTP is 2 million gpd; Wahweap would generate a maximum of 325,000 gpd, and Antelope Point is anticipated to generate about 65,000 gpd. Sufficient capacity is anticipated to be available at Page to accommodate both projects.

Groundwater

Cumulative impacts on groundwater would include extraction of water from the on-site wells and potential risks of contamination from wastewater, waste-oil, and fuel-storage tanks leaking. These potential impacts would be long term, minor, and adverse.

Conclusion

Alternative C would result in short-term, negligible, and adverse impacts on surface-water quality from runoff during construction. Long-term, negligible-to-minor, adverse impacts on surface water quality would occur from potential leaks in fuel and wastewater-containment structures and additional boat use. However, beneficial, long-term, and minor impacts would occur from installation of toilets, curtailing waste along the shoreline that contaminates surface water. No impairment of surface water would result from implementation of this alternative.

Impacts on groundwater quantities would be long term, negligible to minor, and adverse based on the ability of the on-site wells to provide the water needed for the Project. Impacts on groundwater quality would be long term, minor, and adverse based on the risk of contamination from leaking wastewater containment structures and fuel-storage tanks. No impairment of groundwater would result from implementation of this alternative.

4.5 VEGETATION

4.5.1 Laws, Regulations, and Policies

The National Park Service Organic Act directs the NRA to conserve the scenery and the natural objects unimpaired for future generations. NPS *Management Policies 2001* defines the general principles for managing biological resources as maintaining all native plants and animals as part of the natural ecosystem. When National Park Service management actions cause native vegetation to be removed, then the National Park Service will seek to ensure that such removals will not cause unacceptable impacts on native resource, natural process, or other NRA resources.

Exotic species, also referred to as non-native or alien, are not a natural component of the ecosystem. They are managed, up to and including eradication, under the criteria specified in *Management Policies 2001* and NPS-77.

4.5.2 Impact Indicators, Criteria, and Methodology

The impacts of vegetation were evaluated in terms of impacts on native vegetation and non-native vegetation. While riparian ecosystems are considered essential components of the Southwest, on Lake Powell the riparian habitat has been irreversibly changed due to the impoundment of the river and the establishment of non-native species.

The dominant shoreline vegetation below high-water line around Lake Powell is non-native tamarisk. Native riparian ecosystems around the lakes are adversely affected by the dramatic water-level fluctuations and increased soil salinization. Stands of vegetation that are able to establish in the drawdown zone are often inundated and flooded once water levels rise, or lost when water levels rapidly decline. The following were used in interpreting the level of impact on vegetation within the Project site and areas up to 1 mile away:

Negligible: Individual native plants occasionally may be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.

Minor: Impacts on native plants are measurable or perceptible and localized within a relatively small area. The overall viability of the plant community would not be affected and, if left alone, would recover.

Moderate: Impacts on native plants would cause a change in the plant community (e.g., abundance, distribution, quantity, or quality); however, the impact would remain localized.

Major: Impacts on native plant communities would be substantial, highly noticeable, and long term, and affect a sizable portion of affected community type in and out of the NRA. Mitigation measures required to offset the adverse effects would be extensive and their success would not be guaranteed.

Impairment: Impacts on native plant communities would be substantial, highly noticeable, permanent, cannot be mitigated, and affect a relatively large area in and out of the NRA.

When these criteria were not applicable, and in the absence of quantitative data, best professional judgment prevailed.

4.5.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be developed and no change to vegetation would be expected at Antelope Point. Continued use of the area for picnicking and camping would result in vegetation trampling and removal, causing a localized, long-term, negligible-to-minor, and adverse effect on the vegetation resources in the area.

Cumulative Effects

The area of analysis for cumulative impacts on vegetation was limited to the areas within 1 mile of the Antelope Point Project site. Cumulative impacts that would occur under Alternative A would include increased vegetation removal that would result from the road and parking improvement projects. The road improvements could impact plant community continuity, but the overall viability of the community would not be affected. Cumulative impacts would be considered long term, negligible to minor, and adverse.

Conclusion

Impacts on vegetation from the implementation of this alternative would be long term, negligible to minor, and adverse because of continued recreational uses at Antelope Point. No impairment of vegetation would result from implementation of this alternative.

4.5.4 Alternative B (Proposal)

Impact Analysis

Under Alternative B, approximately 139 to 144 acres would be disturbed for the construction of facilities and roads. This acreage includes areas that have been disturbed previously, such as the gravel pit. The placement of the facilities would affect primarily sparsely vegetated areas of blackbrush-shad scale shrubland. The natural recovery of disturbed vegetation in this area would be extremely slow due to arid conditions and sandy, unstable soils. Disturbance areas would be limited to the area necessary for facilities development and construction staging. To the extent feasible, disturbed areas that are not developed would be reclaimed and revegetated with native plant material (subject to National Park Service and Navajo Nation approval); additional native and approved plantings would be used for landscaping in parking areas. Due to the limited amount of vegetation at Antelope Point, the amount that would be disturbed, and the reclamation that would occur, the long-term and adverse impacts on vegetation in the local area would be minor.

Cumulative Effects

Cumulative impacts that would occur under Alternative B include increased vegetation removal that would result from the road and parking improvement projects. The road improvements would further impact plant community continuity. Due to the reclamation associated with the Project, cumulative impacts would be considered long term, minor, and adverse.

Conclusion

Alternative B would create long-term, minor, and adverse impacts on vegetation due to the vegetation removal for the Project facilities. No impairment of vegetation would result from implementation of this alternative.

4.5.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts resulting from construction and operation of Alternative C would be similar to those described for Alternative B. If the trucking option were implemented, approximately 11 to 16 acres less than Alternative B would be disturbed because employee housing and a WWTP would not be developed. If the WWTP were developed for this alternative, approximately 152 to 157 acres would be disturbed, about 13 acres greater than Alternative B. This additional disturbance to vegetation would be marginal compared to Alternative B, and local, long-term, adverse impacts on vegetation would be minor.

Cumulative Effects

Cumulative impacts associated with Alternative C would be similar to those described for Alternative B, with slightly less area being disturbed if trucking of wastewater is implemented. Impacts would be long term, minor, and adverse.

Conclusion

Alternative C would create long-term, minor, and adverse impacts on vegetation due to the vegetation removal for the Project facilities. No impairment of vegetation would result from implementation of this alternative.

4.6 WILDLIFE AND WILDLIFE HABITAT

4.6.1 Laws, Regulations, and Policies

The National Park Service Organic Act, which directs national parks (including Glen Canyon NRA) to conserve wildlife unimpaired for future generations, is interpreted by the National Park Service to mean native animal life should be protected and perpetuated as part of the recreation area's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible. The restoration of native species is a high priority. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and ecological integrity of plants and animals.

The recreation area also manages and monitors wildlife cooperatively with the Arizona Game and Fish Department and the Utah Division of Wildlife.

4.6.2 Impact Indicators, Criteria, and Methodology

Information was gathered from literature and from NRA, state, and federal wildlife specialists to determine whether any of the alternatives could potentially disrupt the natural behaviors of wildlife species within 1 mile around Antelope Point. The following are standards used by the National Park Service in interpreting the level of impact on wildlife:

Negligible: Wildlife and habitats would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species population.

Minor: Effects on wildlife and habitats would be detectable, although the effects would likely be short-term, localized, and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Effects on wildlife and habitats would be readily detectable, long-term and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.

Major: Effects on wildlife and habitats would be obvious, long-term, and would have substantial consequences to wildlife populations, in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Impairment: The impact would contribute substantially to the deterioration of natural resources to the extent that the NRA's wildlife and habitat would no longer function as a natural system.

Wildlife and its habitat would be affected over the long-term to the point that the NRA's purpose (enabling legislation, *General Management Plan*, *Strategic Plan*) could not be fulfilled and the resource could not be experienced and enjoyed by future generations.

When these criteria were not applicable, standard definitions for degree of change related to existing conditions were used. In the absence of quantitative data, best professional judgment prevailed.

4.6.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built. Wildlife or wildlife habitat would continue to be disturbed or displaced from noise, dust, or collision with vehicles, or recreational uses at the site. Aquatic wildlife and wildlife habitat would continue to be disturbed or displaced from watercraft in the area, particularly those launched at Antelope Point. These impacts would be localized, long term, negligible, and adverse.

Cumulative Effects

The area of analysis for cumulative impacts on wildlife and wildlife habitat was limited to the areas within 1 mile of the Antelope Point Project site, including Lake Powell waters. Cumulative impacts on wildlife would result from the impacts described above, in combination with increased access to Antelope Point from road improvements. This increased access would cause disturbance to wildlife and wildlife habitat directly through collision, and indirectly through displacement from noise, dust, or visitor presence. These impacts would be considered localized, long term, negligible to minor, and adverse.

Conclusion

Impacts resulting from implementation of Alternative A would be long term, negligible, and adverse from the continued, but limited recreational uses at Antelope Point. No impairment to wildlife or wildlife habitat would result from implementation of this alternative.

4.6.4 Alternative B (Proposal)

Impact Analysis

Alternative B would result in direct disturbance to approximately 139 to 144 acres of potential or known wildlife habitat and foraging areas. Additional areas nearby, up to approximately 500 acres (a majority of the Antelope Point development area), would be disturbed temporarily by construction-generated noise. Construction activities may result in some impacts to fish and other aquatic wildlife, reptiles, and/or rodents; however, aquatic or terrestrial wildlife mortality would not be anticipated, nor are there any species present at Antelope Point whose population would be impaired by the loss of several individuals. Thus, broad-scale population effects would not occur. Therefore, construction-generated impacts on wildlife and wildlife habitat would be localized, adverse, short term, and minor.

There is no designated critical habitat existing within Antelope Point that would result in the loss of species presently inhabiting the area. Small mammals and reptiles, the two principal terrestrial groups, would be displaced to adjoining areas or adapt to the new conditions. Additional fishing pressure may be exerted on lake species in some areas, and minor amounts of spawning habitat could be lost where marina facilities are located, but these effects would not be measurable. Contaminants from boat use would not be expected to exceed water quality standards or adversely affect aquatic life. Operational impacts on wildlife and wildlife habitat would be localized, adverse, long term, but negligible.

Cumulative Effects

Cumulative impacts on wildlife in the Antelope Point area would include slightly increased mortality to wildlife, primarily rodents and reptiles, due to the increased road traffic on new and/or improved roads. These adverse impacts would occur for the life of the Project, but would be considered minor. Impacts on wildlife and wildlife habitat from the National Park Service and Navajo Nation projects would be minimal, which when combined with the Antelope Project would generate impacts that would be long term, minor, and adverse.

Conclusion

Impacts resulting from implementation of Alternative B would be long term, negligible to minor, and adverse from increased disturbance and presences of facilities and additional visitors at Antelope Point. No impairment of wildlife or wildlife habitat would result from implementation of this alternative.

4.6.5 Alternative C (Preferred Alternative)

Impact Analysis

Direct disturbance to 128 acres of habitat would result from implementation of Alternative C if the trucking option were implemented, 11 to 16 acres fewer than Alternative B. If the WWTP were developed for this alternative, approximately 152 to 157 acres, 13 acres greater than Alternative B, would be disturbed. Although the area of direct disturbance would differ slightly from Alternative B, impacts resulting from construction of Alternative C would be similar to those described for Alternative B (temporary, minor, and adverse). Similarly, operational impacts of Alternative C would be localized, long term, and adverse, but negligible.

Cumulative Effects

Cumulative impacts associated with Alternative C would be similar to those described for Alternative B, with slightly less area disturbed if trucking of wastewater is implemented. Due to the increased road traffic on new and/or improved roads, which would slightly increase mortality of wildlife, impacts would be long term, minor, and adverse.

Conclusion

Impacts resulting from implementation of Alternative C would be long term, negligible to minor, and adverse from increased disturbance and presences of facilities and additional visitors at Antelope Point. No impairment of wildlife or wildlife habitat would result from implementation of this alternative.

4.7 SPECIAL STATUS SPECIES

4.7.1 Laws, Regulations, and Policies

Section 7 of the Endangered Species Act mandates that all federal agencies determine how to use their existing authorities to further the purposes of the Act to aid in recovering listed species, and to address existing and potential conservation issues. Section 7(a)(2) states that each federal agency shall, in consultation with the Secretary of the Interior, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

Management Policies 2001 (Section 4.4.2.3) directs the parks (including the NRA) to survey for, protect, and strive to recover all species native to National Park System units that are listed under the Endangered Species Act. It sets the direction to meet the obligations of the Act. *Management Policies 2001* also directs the National Park Service to inventory, monitor, and manage state and locally listed species, and other native species that are of special management concern to the parks, to maintain their natural distribution and abundance.

4.7.2 Impact Indicators, Criteria, and Methodology

The Endangered Species Act defines the terminology used to assess impacts to listed species as follows:

No Effect: Impacts would not affect a listed species or designated habitat. (**Negligible**)

May Effect/Is not likely to adversely affect: Effects on special status species would be discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or completely beneficial. (**Minor**)

May affect/likely to adversely affect: Effect on a listed species might occur as a direct or indirect result of the proposed action and the effect would either not be discountable or completely beneficial. (**Moderate to Major**) Moderate impacts on species' would result in a local population decline due to reduced survivorship, declines in population and/or a shift in the distribution; no direct casualty or mortality would occur. Major impacts would involve a disruption of habitat, nests and breeding grounds of a protected species such that direct casualty or mortality would result in removal of individuals of a protected species from the population.

Likely to jeopardize proposed species/adversely modify proposed critical habitat: Effects could jeopardize the continued existence of a proposed species or adversely modify critical habitat to a species within and/or outside the park boundaries. (**Impairment**)

The impact analysis focuses on the potential for impacts on threatened and endangered species, or habitat, from direct or indirect impacts associated with the development of Antelope Point Marina, as well as operations and maintenance activities that will be on-going for several years.

A list of potential special-status species with potential habitat in the Antelope Point area was compiled from three main sources: (1) a list of federal endangered and threatened species that may be affected, provided by U.S. Fish and Wildlife Service (FWS); (2) information from the Arizona Game and Fish Department (AGFD) and (3) a list of species protected by the Navajo Nation provided by the Navajo Fish and Wildlife Department (NFWD). Two special-status species on this compiled list were evaluated for presence or potential habitat within the Antelope Point area. Consultation letters with agencies are included in Appendix A.

The impact evaluation for special-status wildlife species for each alternative was based on the following: (1) the possibility of a species or its preferred habitat types occurring in areas that may be affected (based on professional judgment), (2) the direct loss of habitat or individuals, (3) the partial loss of habitat from its modification, and (4) the species' sensitivity to disturbance from human activities that may cause it to abandon currently occupied habitat or deter it from occupying suitable habitat.

4.7.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built; current uses would continue. Only two special-status species, California condor (*Gymnogypo californianus*) and bald eagle (*Haliautut leucocephalus*), have been observed in the vicinity of the project area, but only as transients. Continued uses (disturbance and degradation) at Antelope Point are not anticipated to disturb these species when they are in proximity. Adverse impacts on special-status species would be long term and negligible.

Cumulative Effects

The area of analysis for cumulative impacts on special-status species was defined as being limited to the areas within 1 mile of the Antelope Point Project site. Under the cumulative scenario, increased access would allow increased use of Antelope Point by visitors. Impacts from visitors would include noise generated from vehicles and watercraft and disturbance to potential foraging habitat. These impacts at Antelope Point would be negligible. Together, Alternative A and National Park Service and Navajo Nation projects would result in long-term, negligible, and adverse impacts on special status species.

Conclusion

Impacts on special-status species would be long term, negligible, and adverse due to the continued disturbance and degradation at Antelope Point from campers and boaters. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity. No impairment to threatened, endangered, and sensitive species would result from implementation of this alternative.

4.7.4 Alternative B (Proposal)

Impact Analysis

Section 7 consultation with FWS (Ecological Services, Phoenix, Arizona) was conducted in June of 1985 as part of the DCP/EA evaluation. The FWS office concurred in the biological assessment determination that development within the Project site would not affect any listed or proposed threatened and endangered species. Due to the potential for change since this concurrence, National Park Service contacted FWS in 2001 regarding the current proposal (refer to Chapter 5). Only two species, California condor and bald eagle, have been documented in the vicinity of Antelope Point. Neither species has been observed nesting at or near the Project site. Project construction would result in dust, noise, and other temporary disturbance in the Project site, which could indirectly impact these species. Due to the limited use of the area by these species, construction-generated impacts would be short term, negligible, and adverse. Operational impacts from the development would include increased visitor-generated noise from boats, vehicles, and other recreational uses, and potential trampling of vegetation. These indirect and adverse impacts on the special status species would be long term, negligible, and not likely to adversely affect the populations of either bird species.

Cumulative Effects

Impacts on special-status species generated from the National Park Service and Navajo Nation road and parking improvements would generate increased construction-generated noise and increased visitation to the area. The impact on special-status species would be short term and long term (for construction and operation, respectively), adverse, and negligible, but would likely not adversely affect the populations of either bird species. Combined with the Project, short- and long-term impacts on special status species would be negligible and adverse.

Conclusion

Construction-generated impacts on special-status species from Alternative B would be short term, negligible, and adverse due to the potential for noise, dust, and disturbance generated from equipment and ground-clearing activities. Operational impacts on special status species would be long term, negligible, and adverse from an increased number of visitors using vehicles and watercraft in the area, and from potential vegetation trampling. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity. No impairment to threatened, endangered, and sensitive species would result from implementation of this alternative.

4.7.5 Alternative C (Preferred Alternative)

Impact Analysis

Similar to Alternative B, construction-generated impacts on special-status species would be short term, negligible, and adverse; operational impacts on special-status species would be long term, negligible, and adverse, but would likely not adversely affect the populations of either bird species.

Cumulative Effects

Cumulative impacts from Alternative C and the other identified projects in the area would be the same as the cumulative impacts described under Alternative B, short term, negligible, and adverse, but would likely not adversely affect the populations of either bird species.

Conclusion

Construction-generated impacts on special-status species from Alternative C would be short term, negligible, and adverse because of the noise, dust, and disturbance generated from equipment and ground-clearing activities. Operational impacts on special-status species would be long term, negligible, and adverse from an increased number of visitors using vehicles and watercraft in the area, and from potential vegetation trampling. These negligible impacts would likely not adversely affect the populations of either special status bird species found in the vicinity. No impairment of threatened, endangered, and sensitive species would result from implementation of this alternative.

4.8 CULTURAL RESOURCES

4.8.1 Laws, Regulations, and Policies

Numerous legislative acts, regulations, and National Park Service policies provide direction for the protection, preservation, and management of cultural resources on public lands. Further, these laws and policies establish what must be considered in general management planning and how cultural resources must be managed in future undertakings resulting from the approved plan regardless of the final alternative chosen. Applicable laws and regulations include the National Park Service Organic Act (1916), the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (1992, as amended), the National Environmental Policy Act of 1969 (NEPA), the National Parks and Recreation Act of 1978, the Archeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the Curation of Federally Owned and Administered Archeological Collections (1991).

Applicable agency policies relevant to cultural resources include Chapter 5 of *NPS Management Policies 2001*, and the *Cultural Resource Management Guideline (DO-28)*, as well as other related policy directives such as the *NPS Museum Handbook*, the *NPS Manual for Museums*, and *Interpretation and Visitor Services Guidelines (NPS-26)*.

The Antiquities Act of 1906 (P.L. 209) authorized the President to establish historic landmarks and structures as monuments owned or controlled by the U.S. government and instituted a fine for unauthorized collection of their artifacts.

The National Park Service Organic Act (16 USC 1-4) established the agency to manage the parks and monuments with the purpose of conserving historic objects within them and providing for their enjoyment.

The National Historic Preservation Act of 1966 (16 USC 470, et seq.) requires in section 106 that federal agencies with direct or indirect jurisdiction over undertakings take into account the effect

of those undertakings on properties that are listed on, or eligible for listing on, the National Register of Historic Places. Section 110 of the act further requires federal land managers to establish programs in consultation with the state historic preservation office to identify, evaluate, and nominate properties to the national register. This act applies to all federal undertakings or projects requiring federal funds or permits.

NEPA (P.L. 91-190) sets forth federal policy to preserve important historic, cultural, and natural aspects of our national heritage and accomplishes this by assisting federal managers in making sound decisions based on an objective understanding of the potential environmental consequences of proposed management alternatives. This act applies to any federal project or other project requiring federal funding or licensing. This act requires federal agencies to use a systematic, interdisciplinary approach integrating natural and social sciences to identify and objectively evaluate all reasonable alternatives to a proposed action.

The National Parks and Recreation Act of 1978 (P.L. 95-625) requires that general management plans be developed for each unit in the national park system and that they include, among other things, measures for the preservation for the area's resources and an indication of the types and intensities of development associated with public use of a given unit.

The Archeological Resources Protection Act of 1979 (16 USC 470aa-mm) further codifies the federal government's efforts to protect and preserve archeological resources on public lands by stiffening criminal penalties, as well as instituting civil penalties, for the unauthorized collection of artifacts. Additionally, it establishes a permit system for the excavation and removal of artifacts from public lands, including their final disposition, as well as confidentiality provisions for sensitive site location information where the release of such information may endanger the resource.

The Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) sets forth procedures for determining the final disposition of any human remains, funerary objects, or objects of cultural patrimony that are discovered on public lands or during the course of a federal undertaking.

"The Curation of Federally Owned and Administered Archeological Collections" (36 CFR 79) establishes guidelines and procedures for the proper curation and management of archeological collections owned or administered by federal agencies.

4.8.2 Impact Indicators, Criteria, and Methodology

Impacts on cultural resources were developed based on existing conditions, current regulations, and proposed development. The inventory of archaeological resources in the project area is 95 percent complete. Based on the inventory and existing conditions (refer to Section 3.8 of this document), impact assessments are included for only archeological and ethnographic resources because limited potential exists for historic structures, cultural landscapes, and museum objects to be present on the site.

For purposes of assessing impacts, all unrecorded resources are considered potentially eligible for listing on the National Register of Historic Places. Under Section 106, only historic resources that are eligible for or are listed on the National Register of Historic Places are considered for impacts. An impact, or effect, on a property occurs if a proposed action would alter in any way the characteristic that qualifies it for inclusion on the register. If the proposed action would diminish the integrity of any of these characteristics, it is considered to be an adverse effect.

Archeological Resources

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. An archeological site(s) can be eligible to be listed in the National Register of Historic Places if the site(s) has yielded, or may be likely to yield, information important in prehistory or history. An archeological site(s) can be nominated to the National Register in one of three historic contexts or levels of significance: local, state, or national (see National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*). For purposes of analyzing impacts on archeological resources, thresholds of change for the intensity of an impact are based upon the potential of the site(s) to yield information important in prehistory or history, as well as the probable historic context of the affected site(s). For the purposes of this document, the determination of the level of impacts on archeological resources was accomplished using the following criteria:

Negligible: There would be no direct or indirect impacts on any property potentially eligible for or listed on the National Register of Historic Places.

Minor: Direct or indirect impacts on a property potentially eligible for or listed on the National Register of Historic Places are anticipated; however, these effects would be minor in number, extent, and/or duration. Minor impacts, for example, could include temporary disturbances (such as indirect noise from construction activities) that would not alter the character for which the property has been listed, and the site would be returned to its original state following the action.

Moderate: Direct or indirect impacts on a property potentially eligible for or listed on the National Register of Historic Places are anticipated, and these effects would be greater in number, extent, and/or duration than minor impacts. Moderate impacts, for example could include disturbances (such as the long-term physical alternation of a site that would require mitigation through data recovery techniques) that could alter the character for which the property has been listed, and the site might not resume its original state following the action.

Major: Direct or indirect impacts on a property potentially eligible for or listed on the National Register of Historic Places are anticipated, and these effects would be more substantial in number, extent, and/or duration than moderate impacts. Major impacts could result in the alteration of the character for which the property has been listed, thus potentially disqualifying the property from remaining on the National Register. Examples of major impacts include isolation of a property from or alteration of the character of a property's setting, including removal from its historic location; the introduction of visual, audible, or atmospheric elements

that are out of character with the property or that alter its setting; and neglect of a property resulting in its deterioration or destruction.

Impairment: Loss, destruction, or degradation of a cultural property, resource, or value without mitigation to the point that it negatively affects the NRA's purpose and visitor experience.

In the absence of quantitative data concerning the full extent of actions under a proposed alternative, best professional judgment prevailed.

Ethnographic Resources

Ethnographic resources are those cultural and natural resources to which park-associated communities ascribe cultural significance and which continue to play a role in a community's identity and way of life. Only members of the communities to whom the resources hold cultural value can determine ethnographic resources and potential impacts on them. After initial consultation meetings with representatives of several American Indian tribes having possible traditional associations with park lands and resources, National Park Service determined that the Navajo Nation has the closest association with resources that could be affected by implementation of any alternative. Because the ethnographic resources identified by the tribes are important in each tribe's history, and because the resources are interconnected with places and resources located throughout customary tribal lands, any impacts on ethnographic resources would be regional in scope. In addition, because ethnographic resources are tied to communities' cultural identities, effects to the resources also have an effect on the communities to which they are tied in perpetuity. Therefore, the duration of impacts on ethnographic resources is long-term. Although the tribes themselves did not identify the intensity of potential impacts to ethnographic resources, National Park Service defines intensity as follows:

Negligible: The impact is at the lower levels of detection.

Minor: The impact is slight, but detectable.

Moderate: The impact is readily apparent.

Major: The impact is severely adverse or exceptionally beneficial.

Impairment: A major, adverse impact on a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Glen Canyon NRA; (2) key to the natural or cultural integrity of the NRA; or (3) identified as a goal in the NRA's general management plan or other relevant National Park Service planning documents.

Any adverse impacts on ethnographic resources would be readily apparent to the tribes to whom the resources hold cultural significance, and in most cases, because impacts on these resources affect cultural identity and ways of life, most impacts, whether positive or adverse, would be moderate to major in intensity.

4.8.3 Cultural Resources Consultation

In conjunction with previously proposed, but never built development at Antelope Point, cultural resources of a development area were inventoried and evaluated in consultation with the SHPO, Navajo Nation Historic Preservation Department (NNHPD), and Advisory Council on Historic Preservation. Eleven archeological sites were evaluated as eligible for the National Register for their information potential (Criterion D). Nine of these sites were studied to recover important archeological information, and are no longer eligible for the National Register. The artifacts collected from the archeological sites are significant museum objects, but they have been removed from the development area. The other two archeological sites were determined to be just south of the previously surveyed area of potential effect. No historic buildings or structures are present within or in the vicinity of the development area, and no cultural landscapes have been defined. Two ethnographic resources, identified as Navajo ceremonial areas of recent origin, were identified within the development area but were evaluated as ineligible for the National Register. In consultation with the Diné Medicineman's Association, Inc. it was agreed that those activities could be moved to another location. In summary, there are two known archeological sites within the development area that have not been mitigated, and there may be additional sites, as the entire development area has not been surveyed.

The National Park Service recently consulted with the director of the NNHPD, who has been officially designated as a Tribal Historic Preservation Officer (THPO) since the previous consultation about proposed development at Antelope Point. The THPO concurred with the determination that the proposed development of a marina and resort at Antelope Point would have no adverse effect on significant historic properties within the previously surveyed area of potential effect (Downer 2001).

4.8.4 Alternative A (No Action Alternative)

Impact Analysis

If the No Action Alternative were selected, the proposed Project would not be developed. Current uses of the area would be expected to continue, including boating, camping, and OHV use. Land-based activities would cause potential disturbance or degradation to archeological resources immediately south of the Project boundary. Impacts on archeological resources would be permanent, negligible to minor, and adverse.

Cumulative Effects

The area of analysis for cumulative impacts on cultural resources was defined to be limited to Antelope Point, including areas outside the designated Project boundary. Under the cumulative scenario, Alternative A would have long-term, negligible-to-minor, and adverse impacts resulting from the increased access to the area from transportation and parking improvements, in conjunction with the effects from current uses of the area.

Conclusion

Impacts on archeological resources would be long term, negligible to minor, but adverse from uses that would continue to occur at Antelope Point. No impairment of cultural resources would result from implementation of this alternative.

4.8.5 Alternative B (Proposal)

Impact Analysis

Most of the facilities that would be developed if Alternative B were selected would be within the previously inventoried development area. There are no National Register-eligible historic properties within that development area, but there are two small archeological sites (AZ-K-5-1 and AZ-K-5-2) evaluated as eligible for the National Register located just outside the southern boundary, and final plans should be reviewed to ensure that these sites would not be adversely affected. Four water-supply-storage tanks would be located outside the Project area. These tank locations and the connecting water line routes have not been defined specifically, nor have they been surveyed for cultural resources. In addition, Alternative B would involve construction of a WWTP on 25-to-30 acres located about two miles south of the development area. This location and the routes of connecting sewer and effluent lines also have not been surveyed for cultural resources. Based on the results of survey within the development area and along the access road, one or more archeological sites, with potential to yield important information, could be present within the area of potential effect of these Project elements. There appears to be little or no potential for historic buildings and structures, ethnographic resources, cultural landscapes, or museum objects. Alternative B would have some potential to adversely affect one or more unrecorded archeological sites. However, there would be good potential for making minor modifications to the Project design to avoid impacts or satisfactorily mitigating adverse effects through data recovery studies. Based on the potential for disturbing one or more archeological sites, and the mitigation potential, impacts on cultural resources from implementation of Alternative B would be permanent, minor, and adverse.

Alternative B would include development of a cultural center within the resort complex, which would provide a venue for celebrating traditional Navajo culture and promoting its preservation. Insofar as the Project would economically benefit the Navajo Nation, the Project would have the potential to maintain Tribal government programs, including the historic preservation department. From the perspective of cultural resources, these would be long-term, minor, and beneficial impacts.

Cumulative Effects

Cumulative impacts that would occur under Alternative B would include the effects from the project construction and development described above plus effects related to increased visitation to the Antelope Point Project site and surrounding area, with the potential for additional disturbance and degradation of cultural resources. However, the developed facilities would be the focus of visitors to the area, keeping this potential disturbance to a minimum. Cumulative impacts on cultural resources would be permanent, minor, and adverse.

Conclusion

In summary, if Alternative B were selected, additional cultural resource surveys would need to be conducted. Although one or more archeological sites might be present and could be adversely affected within the unsurveyed zones, the intensity of impacts would be minor, due to the potential for satisfactorily mitigating disturbance of such sites through avoidance and data recovery. Therefore, impacts on cultural resources would be permanent, minor, and adverse. No impairment of cultural resources would result from implementation of this alternative.

4.8.6 Alternative C (Preferred Alternative)

Impact Analysis

Development of Alternative C, with implementation of the trucking option for wastewater, would include development of wastewater holding tanks and a wastewater transfer station in a location outside the previously surveyed area. There are two small archeological sites (AZ-K-5-1 and AZ-K-5-2) evaluated as eligible for the National Register located near the southern boundary of the development area, and final plans should be reviewed to ensure that these sites would not be adversely affected by Project construction. There appears to be little or no potential for historic buildings and structures, ethnographic resources, cultural landscapes, or museum objects. The Alternative C trucking option would have some potential to adversely affect one or more recorded or unrecorded archeological sites. However, there would be good potential for making minor modifications to the Project design to avoid impacts or satisfactorily mitigating adverse effects through data recovery studies. Based on the potential for disturbing or degrading archeological resources, and the ability to mitigate effects, impacts on cultural resources would be permanent, minor, and adverse. Additionally, any increased visitation to the area from Project development would result in impacts on cultural resources that would be permanent, negligible to minor, and adverse.

A secondary option for Alternative C involves construction of a WWTP on a 20- to 25-acre site beyond the area that has been intensively inventoried for cultural resources. Based on the results of survey within the development area and along the access road, one or more archeological sites, with potential to yield important information, could be present within the area of potential effect of these Project elements. There appears to be little or no potential for historic buildings and structures, ethnographic resources, cultural landscapes, or museum objects. The Alternative C secondary WWTP option would have some potential to adversely affect one or more unrecorded archeological sites. However, there would be good potential for making minor modifications to the Project design to avoid impacts or satisfactorily mitigating adverse effects through data recovery studies. Based on the potential for disturbing or degrading archeological resources, and the ability to mitigate effects, impacts on cultural resources would be permanent, minor, and adverse.

Alternative C would include development of a cultural center within the resort complex, which would provide a venue for celebrating traditional Navajo culture and promoting its preservation. Insofar as the Project would economically benefit the Navajo Nation, the Project would have the potential to maintain Tribal government programs, including the historic preservation

department. From the perspective of cultural resources, these would be long-term, minor, and beneficial impacts.

Cumulative Effects

Cumulative impacts that would occur under Alternative C, with the wastewater trucking option, would include effects from project construction and development, plus effects from increased visitation to the area as a result of improved access, parking and the developed facilities. Potential disturbance or degradation of cultural resources could occur, resulting in permanent, negligible-to-minor, and adverse impacts. Cumulative impacts with the WWTP option would be permanent, minor, and adverse.

Conclusion

In summary, Alternative C would not affect any National Register-eligible properties. However, both the trucking and WWTP options would require additional cultural resource surveys. Although one or more archeological sites might be present and could be adversely affected within the unsurveyed zones, the intensity of impacts would be minor, due to the potential for satisfactorily mitigating disturbance of such sites through avoidance and data recovery. Therefore, impacts on cultural resources would be long term, minor, and adverse. No impairment of cultural resources would result from implementation of this alternative.

4.9 PUBLIC SAFETY

4.9.1 Laws, Regulations, and Policies

NPS Management Policies 2001 state that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. Further, the National Park Service will strive to protect human life and provide for injury-free visits (*NPS Management Policies 2001*, section 8.2.5). The National Park Service will seek to provide a safe and healthful environment for visitors and employees. The GMP defined the recreational setting for all shoreline recreation facilities. The 1987 Carrying Capacity Study defined the water-based carrying capacities by setting capacity limits for launch ramps and marinas. Based on visitor use surveys, the National Park Service at Glen Canyon NRA has identified key indicators for visitor satisfaction and boater safety.

4.9.2 Impact Indicators, Criteria, and Methodology

Impacts on public safety were assessed by gathering information on public use of the Antelope Point area from National Park Service staff at Glen Canyon NRA and the Navajo Nation Parks and Recreation Department (NNPRD), estimating public exposure to construction or operational risks under each alternative, using professional judgment, and based on experience with similar projects. The following definitions were used in the assessment of impacts on public safety within 1 mile of Antelope Point:

Negligible: Public health and safety would not be affected or the effects would be at low levels of detection and would not have an appreciable adverse effect on public safety.

Minor: Effects would be detectable and short-term, but would not have an appreciable adverse effect on public safety. If mitigation were needed, it would be relatively simple and would likely be successful.

Moderate: The impact on visitor safety would be sufficient to cause a permanent adverse change in accident rates at existing low accident locations or create the potential for additional visitor conflicts in areas that currently do not exhibit noticeable visitor conflict trends. Mitigation measures may be necessary and would likely be successful.

Major: The impact on visitor safety would be substantial either through the elimination of potential hazards or the creation of new areas with a high potential for serious accidents or hazards.

4.9.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built. The nearest public safety personnel and facilities would be located in Page, Arizona. Continued use of Antelope Point, including unauthorized OHV use, would occur. Although there are relatively few users of the area, there are also no first-aid or safety facilities to respond to any emergency. Therefore, impacts on public safety would remain adverse and long term, but negligible to minor.

Cumulative Effects

The area of influence for the assessment of cumulative impacts on public safety was defined as the area within 1 mile of the proposed Project. The risk to human life from the other projects underway or planned in the area of the proposed development would be very minimal, given the safety measures that are mandated during construction of road improvements and general construction (grading, paving, etc.). Improvements of the road and parking area would provide enhanced vehicle and boat access to Antelope Point and Lake Powell, respectively, and this increased number of visitors could increase the demand for law enforcement and emergency medical services personnel and facilities. However, the purpose of the entrance improvement is to eliminate a safety hazard in that area, which would constitute a long-term, beneficial impact. Overall, cumulative impacts on public safety from all projects would be negligible to minor, generally adverse, and long term due to the continued public exposure to potential risks associated with recreational activities without public safety facilities on site.

Conclusion

Alternative A would result in long-term, negligible-to-minor, adverse impacts on public safety, as there is very limited use of the area, coupled with a lack of on-site safety response facilities or personnel.

4.9.4 Alternative B (Proposal)

Impact Analysis

Under Alternative B, impacts on public safety could occur during construction if the public were exposed to dangerous equipment or conditions. However, safety measures, such as fencing, posting, lighting, and patrolling of the area, would be taken to reduce any adverse impacts to minor levels. Operation of Alternative B would result in an increased number of visitors to the area and opportunities for accidents that are associated with visitor recreation and development sites, especially during the summer months (May through September). The proposed facilities would include one first aid station at the marina, however the increased number of people in the area and potential for accidents associated with recreational activities would result in long-term, seasonally moderate, and adverse impacts on public safety.

Cumulative Effects

The cumulative effects on public safety would include those impacts discussed above, plus the minor impacts that would result from the other two projects in the area. These two projects have very few adverse public safety concerns, and a minor beneficial effect would result from the entrance improvement. Overall, however, the projects would result in long-term, minor, seasonally moderate, adverse impacts on public safety, based primarily on the increased number of people and unavoidable opportunities for accidents that are associated with visitor recreation and site development.

Conclusion

Alternative B would result in long-term, minor to seasonally moderate, and adverse impacts on public safety, as the new development would bring relatively large numbers of people to an area with numerous opportunities for accidents that are associated with visitor recreation and site development. The potential for impacts would be partially mitigated by the provision of a first aid station at the marina.

4.9.5 Alternative C (Preferred Alternative)

Impact Analysis

Under Alternative C, impacts on public safety could occur during construction if the public were exposed to dangerous equipment or conditions. However, safety measures, such as fencing, posting, lighting, and patrolling of the area, would be taken to reduce any adverse impacts to minor levels. Operation of Alternative C would result in an increased number of visitors to the area, especially during the summer months (May through September). The proposed facilities include two designated areas for public safety and first aid—one on the marina and one near the campground store. The Navajo Tribal Police, National Park Service Rangers, and Coconino County Sheriff would share these facilities and public safety responsibilities based on the memorandum of understanding (MOU), providing immediate law enforcement, fire, and emergency medical service response at Antelope Point. Although there would be a much larger number of people in the area and opportunities for accidents due to the variety of uses and

increased recreational use, long-term, adverse impacts would be limited to minor levels due to the presence of these facilities and personnel.

Cumulative Effects

The cumulative effects on public safety would include those impacts discussed for Alternative C, plus the minor impacts that would result from the other two projects in the area. These two projects have very few adverse public safety concerns, and a minor beneficial effect would result from the entrance improvement. Overall, the projects would result in long-term and minor impacts on public safety.

Conclusion

Alternative C would bring relatively large numbers of people to an area with numerous opportunities for accidents that are associated with visitor recreation and development sites. The potential for impacts would be mitigated by the provision of two new designated on-site safety facilities – a first aid station at the marina, and a public safety building near the campground store, which will include law enforcement, fire, and emergency medical services. The resulting impacts on public safety would be long-term, minor, and adverse.

4.10 SOUNDSCAPES

4.10.1 Laws, Regulations, and Policies

The NPS *Management Policies 2001* (section 4.9) requires the agency to preserve, to the greatest extent possible, the natural soundscapes of parks. Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. *Management Policies 2001* directs superintendents to identify what levels of human-caused sound can be accepted within the management purposes of the parks.

Directors Order #47: Soundscape Preservation and Noise Management (DO-47), defines appropriate and inappropriate noise. The overall goal of National Park Service units, as defined in DO-47 is the protection, maintenance, or restoration of the natural soundscape resource. However, it does state that some sound producing activities, including recreational activities, may be appropriate if they are included in the park's purpose as defined by its enabling legislation. The enabling legislation for Glen Canyon NRA states that the purpose of the recreation area is "to provide for public outdoor recreation use and enjoyment... and to preserve scenic, scientific, and historic features contributing to public enjoyment of the area." Therefore, some sound-producing recreational activities are expected in Glen Canyon NRA.

Laws for noise abatement of motorized vessels are regulated by the National Park Service within Glen Canyon NRA and other units of the National Park System (36 CFR, Part 3.7). "Operating a vessel in or upon inland waters so as to exceed a noise level of 82 decibels measured at a distance of 82 feet (25 meters) from the vessel is prohibited." These standards are difficult to enforce, as they require estimation of distances in addition to monitoring sound.

4.10.2 Impact Indicators, Criteria, and Methodology

The unit measurement of sound pressure levels used to describe loudness is a decibel (dB). The human ear does not have the sensitivity to detect low frequency noises, therefore the A-weighted decibel scale (dB(A)) is calibrated to the human ear's response where zero is the threshold of hearing. For the average human a 10 dB increase in the measured sound level is subjectively perceived as being twice as loud, and a 10 dB decrease is perceived as half as loud. The decibel change at which the average human would indicate that the sound is just perceptibly louder or perceptibly quieter is 3 dB.

Existing background noise levels at Glen Canyon NRA are influenced by boats, traffic, and airplanes. While specific background noise studies are not available for Glen Canyon NRA, given its setting, it is assumed that the soundscape ranges from active urban in the developed areas and high use zones on the lake to quiet rural in the outlying areas of the lake where use levels are considerably lower.

The following criteria was used to define specifically the impacts within 1 mile from noise due to construction and operation of a marina at Antelope Point:

Negligible: In the Recreation and Resource Utilization (RRU) zone and Development zone (designated in the Glen Canyon NRA GMP), sound levels rarely exceed levels specified in 36 CFR 3.7. Within the RRU Zone, low-level human-caused sound would occur 50 percent or less of the time during daylight hours. Human-caused noise is rare between the hours of 10:00 PM and 6:00 AM.

Minor: In the RRU and Development zones, sound levels occasionally exceed levels specified in 36 CFR 3.7. During the busiest days, the RRU Zone may experience human-caused noise at moderate levels for a substantial portion of each hour during daylight hours. Human-caused noise is infrequently noticeable between the hours of 10:00 PM and 6:00 AM.

Moderate: In the RRU and Development zones, human-caused sound is present in a majority of the area during most of the time during daylight hours. When present, noise levels can be high compared to the natural soundscape much of the time. Sound levels occasionally exceed 36 CFR 3.7 levels. During the busiest days, a majority of the RRU Zone may experience human-caused noise at moderate to high levels compared to the natural soundscape for a majority of daylight hours. Human-caused noise is occasionally noticeable between the hours of 10:00 PM and 6:00 AM.

Major: In the RRU and Development zones, human-caused sound is present in most of the area during most of the time during daylight hours. When present, noise levels can be high compared to the natural soundscape most of the time. Sound levels exceed 36 CFR 3.7 levels more than rarely. During the busiest days, most of the RRU zone may experience human-caused noise at moderate-to-high levels compared to the natural soundscape for most of each hour during daylight hours. Human-caused noise is often noticeable between the hours of 10:00 PM and 6:00 AM.

Impairment: Noise levels change substantially and conflict with the intended use of that area, thereby precluding the enjoyment of NRA resources by most park visitors.

As quantitative data were not available, the soundscapes impact assessment involved the identification and description of the types of actions that could affect the ambient noise environment, corresponding noise sources, relative source strengths, and other characteristics. Based on the relative source strengths, a qualitative assessment was performed to evaluate the potential for a substantial increase in ambient noise levels that would be disruptive to visitor use of the area. Assessments also were performed where noise-sensitive uses are located or would expose persons to excessive noise levels, taking into account the frequency, magnitude, duration, location, and reversibility of the potential impact.

4.10.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built. Current human-caused sounds generated in the area include automobile traffic, watercraft through the channel, visitor use at Antelope Point, and the nearby Navajo Generating Station, which can occasionally be heard from Antelope Point. No additional human-caused sound would be generated. Therefore, impacts would remain localized, long term, negligible to minor, and adverse.

Cumulative Effects

The area of influence for the assessment of impacts on the natural soundscape was defined as the area within 1 mile of the Antelope Point Project site. The non-natural noise associated with the current uses at Antelope Point, added to the noise associated with the construction of the other projects and the increased traffic and use after their completion would result in long-term, minor, and adverse impacts on the natural soundscape.

Conclusion

Alternative A would result in long-term, negligible-to-minor, adverse impacts on the natural soundscape, due to the disturbance from long-term use of the area by visitors and vehicles. No impairment of the natural soundscape would result from implementation of this alternative.

4.10.4 Alternative B (Proposal)

Impact Analysis

Under Alternative B, noise would be generated during both construction and operation of the proposed facilities. Construction-generated sound would include construction equipment, vehicles, and building activities, which would occur intermittently during the five to eight years of development. Due to the remoteness of the Antelope Point site, noise levels would change noticeably for only those individuals within the immediate area and nearby channel. The temporary duration and intermittent nature of the construction-generated sound would result in localized, short-term, moderate, adverse impacts on park soundscapes. To reduce potential

impacts on soundscapes, all construction vehicles and equipment would be equipped with properly operating and maintained mufflers. In addition, noise-generating construction activities would be limited to daylight hours to minimize the potential impacts on overnight visitors of Antelope Point. Implementation of these measures would reduce potential soundscape construction impacts from moderate to minor in many cases.

Antelope Point is designated as a development area in the Glen Canyon NRA GMP (NPS 1979). This designation, together with NPS *Management Policies 2001*, would presumably allow for noise levels at Antelope Point consistent with other developed areas (i.e., marinas) around Lake Powell. Noise generated at Antelope Point would result from vehicle traffic, watercraft, and area visitors. In addition, an outdoor amphitheater for summer evening concerts would generate noise at Antelope Point. Although no specific noise measurements have been conducted, and specific noise level limits have not been set for the area, it is not anticipated that marina and resort operations (including the amphitheater) would be greater than levels at other marinas (e.g., Wahweap) or would cause disruption of many visitor uses. In addition, the remote location of Antelope Point would minimize noise impacts on sensitive surrounding uses. Therefore, long-term and adverse impacts on soundscapes from Project operations would be considered minor to moderate at most.

Cumulative Effects

Impacts from the construction and operation of the proposed Project would be the dominant aspect of cumulative impacts on the natural soundscape. The other projects in the area would add some noise during construction and contribute to increased visitor use of the area and the associated noise with this use. Together, these actions would result in long-term, minor-to-moderate impacts on the natural soundscape in the area.

Conclusion

Alternative B would add numerous non-natural sources of noise to the area that would exceed ambient levels, but these would not be expected to disrupt most visitor activities. The actions taken during construction and operation of the facilities would result in short-term and long-term, minor-to-moderate, and adverse impacts on the natural soundscape. No impairment of the natural soundscape would result from implementation of this alternative.

4.10.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts on soundscapes resulting from construction and operation of Alternative C would be similar to those described for Alternative B, with perhaps less human-caused sound associated with boating activity, since the facility would support fewer boat slips. Overall, impacts on the natural soundscape would be localized, long term, minor to moderate at most, and adverse.

Cumulative Effects

Cumulative impacts on the natural soundscape essentially would be the same as described for Alternative B (i.e., long term, adverse, and minor to moderate).

Conclusion

Alternative C would add numerous non-natural sources of noise to the area that would exceed ambient levels, but these would not be expected to disrupt most visitor activities (similar to Alternative B). The actions taken during construction and operation of the facilities would result in short-term and long-term, minor-to-moderate, adverse impacts on the natural soundscape. No impairment of the natural soundscape would result from implementation of this alternative.

4.11 TRANSPORTATION AND TRAFFIC

4.11.1 Laws, Regulations, and Policies

NPS Management Policies 2001 (section 9.2) establishes guidelines for development, operation, and maintenance of roadways and trails on National Park Service-managed lands.

4.11.2 Impact Indicators, Criteria, and Methodology

Impacts were analyzed by reviewing existing transportation routes and traffic patterns (i.e., visitor vehicles) at Antelope Point and estimating traffic that would be generated by the various alternatives. The following definitions of intensity were used for the analysis of impacts on transportation and traffic:

Negligible: Impacts would not include measurable or perceptible changes in transportation routes or traffic volumes at Antelope Point.

Minor: Changes to traffic volumes at Antelope Point would be anticipated to be less than 25 percent, with only slight changes to transportation routes (e.g., paving or realignment). New or improved roads and traffic devices consistent with expected traffic would be implemented to mitigate traffic volume increases in excess of 25 percent.

Moderate: Changes to traffic volumes at Antelope Point would be anticipated to be between 26 percent and 75 percent, and changes to transportation routes would include new roads and traffic devices to partially mitigate for additional traffic.

Major: Changes to traffic volumes at Antelope Point would be anticipated to be greater than 75 percent, and changes to transportation routes would include substantial new roads (greater than 50 percent increase to total road length over current conditions); new roads and traffic devices would not adequately mitigate for increased traffic volumes.

4.11.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, no change on transportation or traffic would occur. Impacts from current visitors traveling to and within the area would remain localized, long term, negligible, and adverse.

Cumulative Effects

The area of analysis for cumulative impacts was defined to include land areas within 2 miles of Antelope Point. Impacts on traffic and transportation from road and parking improvements would provide better access to Antelope Point, potentially resulting in a marginal increase to vehicle traffic. The increased traffic, combined with the No Action Alternative, would result in localized, long-term, negligible, and adverse impacts.

Conclusion

Alternative A would result in localized, long-term, negligible, and adverse impacts from visitors traveling to and within the area.

4.11.4 Alternative B (Proposal)

Impact Analysis

Under Alternative B, impacts on transportation and traffic would occur from both construction and operation of the Project. Construction-generated traffic would include trucks and equipment, as well as construction workers' automobiles. Impacts from trucks and traffic would be short term and intermittent, occurring only during the construction of new facilities. Impacts on transportation routes would include heavy vehicles and equipment on State Route 98 and the Antelope Point access road. These impacts on transportation and traffic, primarily associated with construction, would be localized, short term, negligible to minor, and adverse.

Operation of Alternative B would attract an increased number of visitors to the area, with sufficient parking (a total of 800 spaces) to increase the average daily vehicles entering the area during the summer months (June through August) by 200 to 400 percent (refer to visitor vehicle counts in Section 3.11). Although this would be a substantial increase, the main access road into Antelope Point is paved and large enough to handle this capacity. Therefore, the roads within Antelope Point would accommodate the increased use by visitors. In addition to visitor vehicles, delivery and service trucks would be required to enter and exit the Antelope Point area. The number of trucks daily has not been quantified; however, it is expected to be less than 5 percent of total vehicles, which would be negligible relative to the number of visitors. Based on the increased traffic, localized and long-term impacts on traffic and transportation would have the potential to be major. However, installation of traffic controls such as stop signs and speed bumps would occur where appropriate, to reduce impacts to a minor level (with moderate traffic impacts possible during high-use holiday weekends). Therefore, impacts on traffic and transportation would be localized, long term, minor to moderate, and adverse.

Cumulative Effects

Cumulative impacts would be anticipated from the overall increased access to Antelope Point from both the road and parking improvements, as well as the proposed facilities. With implementation of traffic control devices, cumulative impacts on transportation and traffic from operation of Alternative B would be long term, localized, minor to moderate, and adverse.

Conclusion

Construction activities at Antelope Point would include trucks and equipment entering the area; this traffic would be negligible when compared to visitor numbers. Increased visitors to the Antelope Point Project site would occur from operation of Alternative B, resulting in increased traffic. Planned improvements of transportation routes and installation of appropriate traffic control devices would reduce, long-term, adverse impacts to minor-to-moderate levels (with moderate traffic impacts possible during high-use holiday weekends).

4.11.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts resulting from construction and operation of Alternative C would be similar to those described for Alternative B. However, Alternative C includes the option to truck wastewater to Page, Arizona for disposal. This option would require approximately eight trucks daily to haul wastewater. This difference would not be anticipated to increase impacts on transportation and traffic to major levels, given the improvements planned with traffic controls. Therefore, localized, long-term, minor-to-moderate, adverse impacts are expected from Alternative C.

Cumulative Effects

Cumulative impacts associated with implementation of Alternative C would be the same as described for Alternative B, which would be localized, long term, minor to moderate, and adverse.

Conclusion

Construction activities at Antelope Point would include trucks and equipment entering the area; this traffic would be negligible when compared to visitor numbers. Increased visitors to the Antelope Point Project site would occur from operation of Alternative C, resulting in increased traffic. Planned improvements of transportation routes and installation of appropriate traffic control devices would result in localized, long-term, minor-to-moderate, adverse impacts on transportation and traffic (with moderate traffic impacts possible during high-use holiday weekends).

4.12 VISUAL RESOURCES

4.12.1 Laws, Regulations, and Policies

NPS *Management Policies 2001* require the National Park Service to preserve the natural resources and values that exist in the absence of human-caused light.

4.12.2 Impact Indicators, Criteria, and Methodology

Impacts of the Project on visual resources were examined and assessed by comparing the existing visual character of the landscape components and features and the degree to which actions that may result from the alternatives would affect (i.e., contrast or conform with) these components and features.

Potential impacts on scenic resources would consist of substantial changes that would alter either (1) existing landscape character, whether foreground, intermediate ground, or background, and would be visible from viewing areas the National Park Service has established as important, or (2) access to historically important viewing areas. The following definitions of intensity were used for the analysis of visual resource impacts within 1 mile of the Project site:

Negligible: Changes to visual quality or lighting additions to the landscape would be imperceptible or not detectable.

Minor: Changes to visual quality or lighting additions to the landscape would be slightly detectable or localized within a relatively small area and would not alter the landscape character.

Moderate: Changes to visual quality or lighting additions to the landscape would be those that are readily apparent, and/or result in changes to the landscape character that would modify the natural view.

Major: Changes to visual quality or lighting additions to the landscape would be substantial, highly noticeable, and/or result in changing the character of the landscape such that the changes are long term. Mitigation measures may be partially effective in reducing impacts.

Impairment: Changes to visual quality or lighting additions to the landscape would contribute to a permanent change to the character of the landscape, such that uses and levels of visitor satisfaction identified as part of Glen Canyon NRA's purpose could no longer be provided over the long term for future generations. Mitigation measures would not reduce impacts.

4.12.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built. Therefore, no change to scenic resources or night skies would occur. Current camping practices and occasional OHV use would continue, degrading the natural appearance of the area. The gravel pit area would not be

reclaimed, and would remain a visual scar on the site. Impacts would be localized, long term, negligible to minor, and adverse.

Cumulative Effects

The area of analysis for cumulative impacts was defined to include the Antelope Point Project site and visible areas within approximately 5 miles of the site. The Navajo Generating Station and the City of Page are both visible from Antelope Point and its surrounding areas on the lake. Impacts on visual resources from other projects in the area would be minimal because road and parking improvements generally would occur within previously disturbed areas that are of poor natural scenic quality. Increased visitation to Antelope Point from the access improvements would contribute only marginally to degradation of the area that would occur under Alternative A alone. However, the existing modifications to the landscape character together with the cumulative projects would result in long-term, minor-to-moderate, and adverse impacts on visual resources.

Conclusion

Continued camping and occasional OHV use would degrade the natural appearance of the area under Alternative A, and the gravel pit area would not be reclaimed, resulting in localized, long-term, negligible-to-minor, and adverse impacts on visual resources. No impairment of visual resources would result from implementation of this alternative.

4.12.4 Alternative B (Proposal)

Impact Analysis

Under Alternative B, impacts on scenic resources would occur during both construction and operation of the Project. Construction would generate dust temporarily, creating some visual intrusion to views from Lake Powell, but due to the remote location of Antelope Point, the dust would affect very few viewers. These adverse impacts would be short term and minor.

Alternative B would not dominate existing natural NRA features, or interfere with natural processes, but it would alter the landscape character and the development would be visible or readily apparent from the nearby surrounding area. However, the change to the landscape character would be consistent with the Glen Canyon NRA General Management Plan, which designates Antelope Point as a potential development site. In addition, final designs for the Project would specify that facilities complement the natural and cultural landscape of the area by incorporating Navajo themes and natural colors, as well as restrict the heights of facilities constructed. Based on these design considerations, structures would not be anticipated to contrast substantially with the natural environment nor block scenic views to and from Lake Powell. Final designs also would be subject to Standards and Guidelines for Sustainability and the approval of a Sustainability Review Board (Hudgins 2001). The proposed WWTP would be distanced from the main development area, and located such that it would not be highly visible from the Antelope Point Project site or Lake Powell.

Alternative B would include dry storage area and maintenance facilities, encompassing approximately 20 acres, which would be set back from the main entry road a distance of up to 40 feet. Berming and vegetative screening would be implemented to mitigate views of the storage area from the entry road; the natural terrain would partially to fully screen views of the storage facility from Lake Powell.

Development of Alternative B would include the addition of lighting to the area to ensure a safe environment for visitors. Outdoor lighting would be the minimum necessary, white for energy efficiency, and would be shielded and directed downward to minimize effects on night skies. No uplighting of buildings or landscaped areas would be allowed. All final lighting plans would be submitted to review by the National Park Service for compliance with the Dark Sky Policy.

Based on the visibility of the proposed facilities from the surrounding area, the design features (mitigation measures) that would be implemented, and lighting that would be added to the area, impacts on visual resources would be long term, minor to moderate and adverse.

Cumulative Effects

Existing developed features nearby, particularly the Navajo Generating Station and the City of Page, are readily apparent from Lake Powell in this area, making the existing scenic character less than pristine. Impacts on visual resources from the nearby road improvements would be localized, long term, adverse, and negligible to minor because these improvements would occur in existing road and parking areas. Cumulative impacts on visual resources from the road improvements together with Alternative B would be similar to the direct impacts described for Alternative B alone, which would be localized, short-term, and minor impacts during construction and localized, long-term, minor-to-moderate, and adverse impacts from operations.

Conclusion

Construction would generate dust temporarily, creating some visual intrusion to views from Lake Powell, causing short-term, minor, and adverse impacts. Based on the visibility of the proposed facilities within the surrounding area, the design features (mitigation measures) that would be implemented, and lighting that would be added to the area, impacts on visual resources would be long term, minor-to-moderate and adverse. No impairment of visual resources would result from implementation of this alternative.

4.12.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts resulting from construction of Alternative C would be similar to those described for Alternative B (localized, short term, minor and adverse). Operational impacts of Alternative C would be similar to those described for Alternative B, with two main differences. First, the dry storage area and maintenance facility would occupy about 38 acres and would still include screening by berms and vegetation, but the facility would be set back from the road up to 200 feet, reducing potentially adverse impacts on visual resources. Second, if the trucking option were implemented, less area would be disturbed and developed, and any intrusion from the

WWTP to views would be eliminated. If the WWTP option were implemented, it would be located near the main entry road, south of the employee housing. This would be highly visible from the entry road, and likely would be visible from the lake. This would not be anticipated to detract from natural views because screening of the facility with vegetation would be implemented to ensure it would not alter the landscape character. In general, operational impacts would be localized, long term, minor to moderate, and adverse.

Cumulative Effects

Existing developed features nearby, particularly the Navajo Generating Station and the City of Page, are readily apparent from Lake Powell in this area, making the existing scenic character less than pristine. Impacts on visual resources from the nearby road improvements would be localized, long term, adverse, and negligible to minor because these improvements would occur in existing road and parking areas. Cumulative impacts on visual resources from the road improvements together with Alternative C would be similar to the direct impacts described for Alternative C alone, which would be localized, short-term, and minor impacts during construction and localized, long-term, minor-to-moderate, and adverse impacts from operations.

Conclusion

Construction would generate dust temporarily, creating some visual intrusion to views from Lake Powell, causing short-term, minor, and adverse impacts. Based on the visibility of the proposed facilities within the surrounding area, the design features (mitigation measures) that would be implemented (including screening of the dry storage area), and lighting that would be added to the area, impacts on visual resources would be long term, minor to moderate and adverse. No impairment of visual resources would result from implementation of this alternative.

4.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.13.1 Laws, Regulations, and Policies

In accordance with NPS *Management Policies 2001* (section 8.2.2.2), the NRA may permit commercial visitor services that are necessary and appropriate for public use and enjoyment of the park, and that are consistent to the highest practicable degree of preservation and conservation of the NRA's resources and values. The Glen Canyon NRA *Commercial Services Plan* was prepared to develop a strategy to meet visitor needs while maintaining the purposes and values of the NRA. National Park Service management policies do not consider socioeconomic resources a true park resource, only an impact topic. Therefore, impairment is not included as an impact category.

4.13.2 Impact Indicators, Criteria, and Methodology

In evaluating the impacts on socioeconomic resources, commercial operations within the NRA, in adjacent communities, and in the region were considered. Concessions specialists and members of the business community were consulted to assess potential impacts from each alternative. However, without substantial research, it is difficult to establish definitive figures

and costs associated with each impact topic. Therefore a more general discussion of the impacts on socioeconomic resources is included in the consequences section.

Negligible: No effects would occur or the effects on socioeconomic conditions would be below or at the level of detection. The effect would be slight and no long-term effects on socioeconomic conditions would occur.

Minor: The effects to socioeconomic conditions would be detectable. Any adverse or beneficial effects would be small. If mitigation were needed to offset potential adverse effects, it would be simple and successful.

Moderate: The effects on socioeconomic conditions would be readily apparent and likely long-term. Any adverse or beneficial effects would result in changes to socioeconomic conditions on a local scale. If mitigation is needed to offset potential adverse effects, it could be expensive, but would likely be successful.

Major: The effects on socioeconomic conditions would be readily apparent, long-term and would cause substantial adverse or beneficial changes to socioeconomic conditions in the region. If mitigation measures were required to offset potential adverse effects, they would be expensive and their success could not be guaranteed.

The assessment of potential impacts on the socioeconomic environment involved: (1) collecting and examining data for current land uses, population, housing, employment, and recreational opportunities in the Antelope Point area; and (2) comparing the current situation to situations likely to occur under each alternative, based on proposed land uses, estimates of housing and employment, and proposed recreational opportunities. The assessment of impacts, both beneficial and adverse, was based on professional judgment and input from both National Park Service and the NNDED. The assessment also addresses environmental justice concerns that must be considered per Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.

4.13.3 Alternative A (No Action Alternative)

Impact Analysis

Land Use, Population, Employment, Housing, and Recreation

Under the No Action Alternative, no changes to land uses, population, employment, housing, or recreation would occur. Current land uses would continue, including camping and occasional OHV use, causing degradation to the Antelope Point Project site, which would have long-term, negligible, and adverse impacts on land uses. No additional employment, housing, or recreational opportunities would be developed resulting in a continuing lack of sustainable revenue for the Navajo Nation. This would be a long-term, minor, and adverse impact.

Environmental Justice

As described above, no additional employment, housing, or recreational opportunities would be developed resulting in a continuing lack of sustainable revenue for the Navajo Nation. The Navajo Nation is considered a low-income and minority population; therefore, environmental justice impacts would be a long term, minor, and adverse.

Cumulative Effects

The area of analysis for cumulative impacts was defined to include Antelope Point and areas within 2 miles of the project. Socioeconomic impacts from the road improvement projects would be limited to small amounts of revenue generated by the Navajo Nation from increased visitation to Antelope Point as a result of enhanced access; this would be a long-term, negligible, but beneficial impact. Development and implementation of a Lakewide Housing Master Plan may result in improved or increased housing for concessioner employees in and near the NRA, as well as short-term construction employment. This would result in short-term, negligible-to-minor, beneficial impacts on employment and long-term, negligible-to-minor (depending on specific location), beneficial impacts on the region's housing. Despite the beneficial impacts, the improvements, combined with impacts of Alternative A, would, in general, result in long-term, negligible-to-minor, and adverse impacts due to the lack of opportunities for members of the Navajo Nation.

Conclusion

Continued unregulated recreational uses and lack of sustainable revenue for the Navajo Nation would result in long-term, negligible-to-minor, and adverse impacts on land uses, population, employment, housing, and recreation. Impacts resulting from the lack of employment opportunities and sustainable revenue for the Navajo Nation would result in long-term, minor, and adverse impacts on a low-income and minority population (the Navajo Nation).

4.13.4 Alternative B (Proposal)

Impact Analysis

Land Use

Alternative B would not displace any residents. It would provide enhanced facilities for recreational uses and the continuation of existing uses, though camping would occur in a developed campground.

Development of Alternative B would require leasing of approximately 710 acres of Navajo land for the Antelope Point Project; the land would be leased to the developer/operator through a Navajo business site lease. This would be considered a localized, long-term, negligible, and adverse impact on land uses.

The Project would not directly affect the water intake facility for the Navajo Generating Station, except that the road would become a shared access route. A mutually satisfactory road

maintenance agreement may have to be developed between the Navajo Nation and Salt River Project, which operates the Navajo Generating Station. The attraction of greater numbers of people to Antelope Point could lead to increased trespassing at the intake facility by curious bypassers. Additional security may be needed at the intake facility, and there would be a need to address additional safety concerns with the Navajo Generating Station's electrical service line that extends from the intake facility to the power plant.

Livestock that roam into the Antelope Point area would be displaced by development. However, the amount of forage lost would be minimal (less than that needed by one cow yearly), and the economic impact would be insignificant. The development area and access road would be fenced, where necessary, to exclude livestock and cattle guards would be installed at appropriate points to assist in keeping livestock outside the development area. In addition, along Antelope Point Road, signs would indicate open range and caution visitors to watch for livestock on the roadway. Access to some of the more easily reached shoreline watering areas no longer would be available if the Project were developed. The remaining shoreline outside the development zone should be reviewed to make certain continued access to water would be available or, alternatively, a stock tank could be provided in an area of good forage to the east.

Based on the land withdrawal and effects on the water intake facility and livestock, only localized, negligible, long-term, and adverse impacts would occur from operation of Alternative B.

Antelope Island would experience increased visitation and use under Alternative B. This usage would come from increased numbers of boaters anchoring at beaches along the island to hike, swim, fish, picnic, or camp. Such activities are permitted in this area and generally would not cause physical disturbance. They would not intrinsically conflict with the island's use as a Research Natural Area. In addition, the island is close enough to the proposed Antelope Point launching areas that the great majority of boaters originating from Antelope Point would be expected to travel farther on Lake Powell for boat trips of more than a few minutes' duration, and therefore would not affect the island.

The potential for adverse effects exists, however, and use of Antelope Island should be regulated and monitored by National Park Service. Small, motorized vehicles could be transported to the island via houseboat, which would seriously affect the objective of preserving Antelope Island in its natural condition. However, these impacts are not unique to development of Antelope Point. They could result from any of the planned developments that would increase the number of boats launched on Lake Powell. Adverse impacts would be minimized with National Park Service shoreline patrols and the enforcement of regulations applicable to the Glen Canyon NRA. No impacts on Antelope Island would occur during construction of Alternative B; operational impacts would be localized, long term, adverse, and minor.

Population

Development of Alternative B would increase the number of individuals living at Antelope Point to between 100 and 120 individuals, if employee housing were developed. These individuals likely would be from the nearby Lechee Chapter, other Navajo Nation chapters, or the City of

Page, Arizona. No impacts on populations of Page, Coconino County, the Navajo Nation, or the State of Arizona would be anticipated. Further, the proposed infrastructure would accommodate the resident population expected at Antelope Point. Impacts on population would be localized, long term, and negligible to minor.

Employment

Development of the proposed Project would generate approximately 186 jobs year-round and an additional 150 jobs during the summer months. Based on the 2000 labor force for the Page, Arizona area (4,331 individuals), these jobs would result in a 4 to 8 percent increase in the labor force in the area. Additionally, assuming that the unemployment rate for the area has not dramatically changed (from 4.5 percent or 194 individuals), employment generated by development of the Project would create a long-term, moderate, and beneficial impact on the area.

In addition, Antelope Holdings would follow all applicable federal, Navajo Nation, and local employment and preference laws in selecting qualified applicants for employment. This would result in long-term, minor-to-moderate, beneficial impacts on members of the Navajo Nation.

Housing

Under Alternative B, housing for approximately 98 employees could be developed (development of housing would remain optional). Based on the need for employee housing documented by National Park Service for the Page and Wahweap areas, development of employee housing, if needed to meet Project employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region.

Recreation

Development of Alternative B would affect current uses of the Antelope Point for certain recreational activities. The marina would be located along the northeast side of Antelope Point, displacing current recreational uses now taking place, which include informal camping, swimming, and some fishing. However, Alternative B would result in an increase in the variety of recreational activities available at Antelope Point. Current recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas. Therefore, localized, long-term, minor-to-moderate, and beneficial impacts on recreation would occur.

Environmental Justice

Impacts from implementation of Alternative B would include increased employment and income, as a result of development at Antelope Point. These opportunities would be considered long-term, minor-to-moderate, and beneficial impacts on the Navajo Nation (a low-income and minority community).

One environmental justice concern raised during public scoping was the potential for the Project to encourage increased alcohol consumption by members of the Navajo Nation. The Navajo

Nation Council passed Resolution CJY-62-01, amending 17 NNC §412, to authorize and permit the transportation, sale, delivery, and consumption of alcoholic beverages within the Antelope Point development area of the Navajo Nation and Glen Canyon NRA. The resolution limits alcohol sales specifically to the Antelope Point Project area. The Navajo Nation anticipates that the primary consumers of alcohol would be visitors of Antelope Point, not members of the Navajo Nation, for two reasons. First, an entrance fee of \$10.00 per car is required to enter the area (Antelope Point). Second, alcoholic beverages are and will continue to be available in the restaurants, bars, and retail outlets within the City of Page at a much lower price than those that would command resort price rates at Antelope Point. Therefore, the Navajo Nation has concluded that it would be unlikely for members of the Navajo Tribe to go to Antelope Point for the purpose of acquiring alcohol. In addition, a percentage of the revenues generated from the sale of alcohol will be used to augment funding of Behavioral Health Alcoholism Treatment Programs currently operating in the Lechee and Page areas (Market Value Planners 2001). Based on the opportunity to purchase less expensive alcohol in Page, and that some revenues from the sale of alcohol will be used to augment funding of treatment programs, impacts on individuals or the Navajo Nation community from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.

Cumulative Effects

Impacts from the road improvement projects would be limited to a marginal amount of revenue generated by the Navajo Nation from increased visitation to Antelope Point as a result of enhanced access; this would be a long-term, negligible, but beneficial impact. Cumulative impacts on the socioeconomic environment would, in general, be the same as those direct impacts described for Alternative B, with adverse impact ranging from negligible to minor, and beneficial impacts ranging from minor to moderate. Slight additional benefits would occur to the region from development and implementation of a Lakewide Housing Master Plan.

Conclusion

Land use impacts occurring from the leasing of Navajo land, effects on the water intake facility from visitors, and livestock displacement would be localized, negligible, long term, and adverse. Impacts on Antelope Island from increased visitors would be localized, minor, long term, and adverse. Impacts on population would be long term and negligible to minor. Employment generated by development of the Project would create a long-term, minor-to-moderate, and beneficial impact on the area. Development of employee housing, if needed to meet Project employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region. Recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas, resulting in localized, long-term, minor-to-moderate, and beneficial impacts. Impacts on low-income and minority communities (i.e., the Navajo Nation) would be primarily long term, minor to moderate, and beneficial; impacts resulting from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.

4.13.5 Alternative C (Preferred Alternative)

Impact Analysis

Land Use, Population, Employment, Housing, and Recreation

In general, impacts resulting from construction and operation of Alternative C would be similar to those described for Alternative B, although slightly different land areas would be disturbed and developed and fewer boat slips could reduce potential adverse impacts on Antelope Island. Land use impacts occurring from the leasing of Navajo land, effects on the water-intake facility from visitors, and livestock displacement would be localized, negligible, long term, and adverse. Impacts on Antelope Island from increased visitors would be localized, minor, long term, and adverse. Impacts on population would be long term and negligible to minor. Employment generated by development of the Project would create a long-term, minor-to-moderate, and beneficial impact on the area. Development of employee housing, if needed to meet Project employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region. Recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas, resulting in localized, long-term, minor-to-moderate, and beneficial impacts.

Environmental Justice

Impacts on low-income and minority communities (i.e., the Navajo Nation) would be similar to those described for Alternative B, primarily long term, minor to moderate, and beneficial due to the employment generated from the Project. Based on the limited potential for members of the Navajo Nation to enter Antelope Point for the sole purpose of purchasing alcohol, the impacts resulting from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.

Cumulative Effects

Impacts from the road improvement projects would be limited to a marginal amount of revenue generated by the Navajo Nation from increased visitation to Antelope Point as a result of enhanced access; this would be a long-term, negligible, but beneficial impact. Cumulative impacts on the socioeconomic environment would, in general, be the same as those direct impacts described for Alternative C, with adverse impact ranging from negligible to minor, and beneficial impacts ranging from minor to moderate. Slight additional benefits would occur to the region from development and implementation of a Lakewide Housing Master Plan.

Conclusion

Land use impacts occurring from the leasing of Navajo land, effects on the water intake facility from visitors, and livestock displacement would be localized, negligible, long term, and adverse. Impacts on Antelope Island from increased visitors also would be localized, minor, long term, and adverse. Impacts on population would be long term and negligible to minor. Employment generated by development of the Project would create a long-term, minor-to-moderate, and beneficial impact on the area. Development of employee housing, if needed to meet Project

employment needs, would result in long-term, but minor, beneficial impacts on housing conditions in the region. Recreational uses at Antelope Point would be enhanced by development of a campground and RV park, fishing docks, and maintenance of day-use and beach areas, resulting in localized, long-term, minor-to-moderate, and beneficial impacts. Impacts on low-income and minority communities (i.e., the Navajo Nation) would be primarily long term, minor, and beneficial; impacts resulting from the sale of alcohol at Antelope Point would be expected to be long term, negligible to minor, and adverse.

4.14 WASTE MANAGEMENT

4.14.1 Laws, Regulations, and Policies

In accordance with NPS *Management Policies 2001* (section 9.1), the National Park Service will implement solid and hazardous waste management practices that integrate waste reduction, reuse, and recycling programs to minimize the generation and disposal of solid waste from National Park Service-managed lands.

In addition to waste minimization and reduction, National Park Service also will conduct its activities in ways that use energy wisely and economically (NPS *Management Policies 2001*, section 9.1), in accordance with Executive Order 13123, *Greening the Government through Effective Energy Management*.

4.14.2 Impact Indicators, Criteria, and Methodology

Impacts related to waste management were assessed by examining the waste management actions proposed under each alternative, considering the energy demands of each alternative, and by determining if any actions would cause impacts on human health and the environment. The intensity of impacts, with respect to waste management, are defined as the following:

Negligible: No effects would occur or the effects on waste generation and energy consumption would be below or at the level of detection.

Minor: The effects on waste generation and energy consumption would be slightly detectable or localized within a relatively small area and relatively short term. Mitigation measures, if needed, would be inexpensive, simple and successful.

Moderate: The effects on waste generation and energy consumption would be readily apparent and likely long-term. Mitigation measures could successfully reduce potential impacts.

Major: The effects on waste generation and energy consumption would be readily apparent, long-term and could cause substantial changes to the environment or human health, which would be long lasting. Initiatives applied or mitigation measures used would require extensive funding, be relatively complex and success would not be assured.

4.14.3 Alternative A (No Action Alternative)

Impact Analysis

Under the No Action Alternative, the Project would not be built. No change to solid waste management would occur, and there would be minor amounts of trash and other solid waste generated from the ongoing camping, boating, and visitor use at the site. Toilet facilities would be pumped out, with no impacts on the environment or human health, and solid waste would be collected daily in summer and weekly in the lower use winter season. No hazardous materials or waste would be expected at Antelope Point. Only negligible amounts of energy would be expended under current management (e.g., garbage trucks and portable toilet pump-out trucks/generators). Any adverse impacts related to waste generation and energy consumption would be long term and negligible to minor.

Cumulative Effects

The area of influence for assessing cumulative effects related to waste management was defined as the area within 1 mile of the Project site. The other projects that have occurred or are planned for the area would generate small amounts of construction waste, trash, and use portable toilet facilities similar to those used at the site. All wastes would be collected and removed from the sites, with no effect on the environment or human health. Energy consumption would occur during the paving of parking areas. Any adverse cumulative impacts related to waste generation and energy consumption from all of these projects would be short term and negligible to minor.

Conclusion

Waste generation under Alternative A would involve relatively small amounts of trash and use of portable or vault toilet facilities; no energy consuming facilities would be developed. This would cause few, if any, discernible adverse effects on human health or the environment, resulting in negligible-to-minor, short-term, and adverse impacts.

4.14.4 Alternative B (Proposal)

Impact Analysis

Alternative B would provide for either treatment or off-site disposal of wastewater generated by the facility, eliminating the need for many portable or vault toilets and periodic pumpouts. There would be increased solid waste generation at Antelope Point, as well as generation of small amounts of hazardous waste (e.g., oils, lubricants). Solid waste management would include placement of trash cans (and recycling cans) throughout Antelope Point. Solid waste would be collected and transported by truck to an approved landfill for disposal. Although estimates of the amount of solid waste or number of truck trips required are not available, solid waste generated at Antelope Point would not be anticipated to result in more than localized, minor, but long-term and adverse, impacts. Hazardous waste generated would be managed consistent with state hazardous waste/Resource Conservation and Recovery Act regulations. However, Antelope Point would not generate more than 100 kilograms per month and would be considered a conditionally exempt small quantity generator. Also, Antelope Holdings has committed to

several measures to reduce the amount of hazardous material present, to provide proper training in waste management and spill response, and to emphasize recycling (refer to Section 2.8 of this document). Therefore, impacts from hazardous waste management also would be localized, minor, long term, and adverse.

Energy would be consumed during construction, operation, and maintenance of the proposed facilities. Measures would be implemented to ensure energy is conserved (e.g., construction vehicles and equipment would be maintained in proper working order to ensure excess fuel is not burned). Development of the Marina Village, hotel, cultural center, and other facilities would be subject to the U.S. Green Building Council's Leadership in Energy and Environmental Design standards. The project design and implementation would include specific energy-efficient measures for lighting, building materials, window glazing, passive solar heating, passive cooling strategies, and other design details (Hudgins 2001). Additionally, Antelope Holdings would look for best management practices to reduce gasoline consumption, improvement of emissions, or fuel switching in the fleet of watercraft that they maintain. Due to the extensive conservation measures implemented as part of the project, energy consumption would result in localized, long-term, minor, and adverse impacts.

Cumulative Effects

The small amount of waste generated by the other projects in the area would add very little to the waste anticipated from the proposed Project. With implementation of the mitigation measures proposed and the management practices described under Alternative B, cumulative impacts related to waste generation and energy consumption would be adverse, long term, and minor.

Conclusion

Although there would be much more waste to manage under Alternative B, the Project includes mitigation and other standard provisions for safe and effective wastewater treatment or disposal, and solid or hazardous waste management, such that the long-term, adverse impacts related to waste management would be kept to minor levels. Energy consumption would be limited through the use of efficient designs, use of specific building materials, and other best management practices.

4.14.5 Alternative C (Preferred Alternative)

Impact Analysis

Impacts resulting from construction and operation of Alternative C would be very similar to those described for Alternative B, although waste generation and energy consumption might be slightly reduced due to the fewer number of slips available resulting in fewer visitors. All mitigation to reduce impacts related to conservation potential described under Alternative B would be followed. Therefore, impacts would be long term, minor, and adverse.

Cumulative Effects

Cumulative impacts from actions under Alternative C and the other projects in the area would be essentially the same as described for Alternative B (i.e., adverse, long term, and minor).

Conclusion

Alternative C would involve the management of a relatively large amount of waste compared to the current use of the area. However, there would be mitigation and other standard provisions for safe and effective wastewater treatment or disposal, and solid or hazardous waste management, such that the long-term, adverse impacts related to waste generation and energy consumption would be kept to minor levels, similar to Alternative B.

5.0 CONSULTATION AND COORDINATION

5.1 INTRODUCTION

During the planning process for this environmental assessment (EA), formal and informal efforts were made by the Navajo Nation and National Park Service to involve other federal agencies, state and local governments, Navajo Nation Chapters, and the public. The Navajo Nation and National Park Service initiated the EA process in August 2001 by requesting comments to determine the scope of issues and concerns that needed to be addressed during the EA process; a public scoping workshop was conducted in September 2001. In addition, Navajo Nation Division of Economic Development (NNDED) presented information about the Project to members of the Navajo Nation at regular meetings of six Navajo Nation Chapters. Also part of the resource inventory, various agencies have been contacted to request data to supplement and update the information available in the previous EA (completed with the Development Concept Plan [DCP] for Antelope Point) (NPS 1986). The EA has been distributed to relevant agencies and the interested public for review and comment.

This section describes these efforts including the formal consultation required and the public involvement activities that were conducted. Sections 5.4 and 5.5 provide lists of individuals involved with preparation and review of the document, and recipients of this EA, respectively.

5.2 AGENCY CONSULTATION

5.2.1 Special-Status Species

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with U.S. Fish and Wildlife Service (FWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. National Park Service requested a list of federally endangered and threatened species that may be present at the Antelope Point site from FWS. This list was used as a basis for the special-status species analysis in this EA.

The FWS will review the special-status species analysis in this EA as part of an ongoing consultation process. All consultation requirements will be fulfilled, as defined by Section 7 of the Endangered Species Act, before a Finding of No Significant Impact can be signed.

Navajo Fish and Wildlife Department (NFWD) also has been contacted regarding special-status species on the Navajo Nation that may be present at the Project site.

The National Park Service also has contacted Arizona Game and Fish Department (AGFD) to request information on state-listed special-status species that may occur at or near Antelope Point. A copy of this EA has been sent to AGFD for review and comment.

5.2.2 Cultural Resources

The National Park Service cultural resource management program operates in accordance with Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, and other laws, regulations, and policies. Under these laws, regulations, and policies, the Arizona SHPO was contacted in 1986 regarding nine archeological and two ceremonial sites within the Project site. A draft data recovery plan was submitted to the Arizona State Historic Preservation Office (SHPO), Glen Canyon National Recreation Area (NRA), and the Navajo Nation Historic Preservation Department in 1986; and an antiquities permit was issued in 1987 for data recovery work. Data recovery was completed in 1988 by the Navajo Nation Archeology Department. In June 1997, the Arizona SHPO indicated that they had no record of being consulted on the initial survey report or the data recovery report and requested copies for their review. In September 1997, the Arizona SHPO concurred with Glen Canyon NRA that Section 106 responsibilities had been satisfactorily completed for the Antelope Point Project. An EA has been sent to the Arizona SHPO for review and comment.

In accordance with the NHPA, efforts were made to identify and consider traditional cultural places. Traditional cultural places are ethnographic resources that are eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are (1) rooted in that community's history, and (2) important in maintaining the continuing cultural identity of the community.

Table 5-1 lists these and other agencies and organizations contacted regarding the Project.

TABLE 5-1	
AGENCIES AND ORGANIZATIONS CONTACTED	
U.S. Fish and Wildlife Service	Navajo Nation, Shonto Chapter
U.S. Army Corps of Engineers	Navajo Nation, Inscription House Chapter
Navajo Nation Division of Economic Development	Navajo Nation, Navajo Mountain Chapter
Navajo Nation Department of Water Resources	Navajo Nation, Gap/Bodaway Chapter
Navajo Nation Department of Fish and Wildlife	Navajo Nation, Coppermine Chapter
Navajo Nation Historic Preservation Department	Arizona State Historic Preservation Office
Navajo Nation, Lechee Chapter	National Park Service Intermountain Region

5.3 PUBLIC INVOLVEMENT ACTIVITIES

The purpose of the scoping process is to identify issues and concerns related to the Project and to identify the range of issues to be addressed in the EA. In preparation for scoping, a mailing list of approximately 240 agencies, interested organizations, and individuals was established. A scoping notice was prepared in September 2001 and mailed to those on the list, with remaining copies distributed by National Park Service and NNDED. The scoping notice included a brief description of the facilities proposed, the process for completing the EA, and opportunities for public participation (i.e., the upcoming public scoping workshop). The notice also contained a one-page response form for readers to complete and return to the National Park Service at Glen Canyon NRA. The response forms were designed to provide respondents an opportunity to

provide comments on the Project and to ensure that future mailings were sent to those indicating an interest in the Project. A press release was issued by the National Park Service, Glen Canyon NRA, on August 31, 2001 announcing the initiation of the scoping period for the project and the date for the public scoping workshop. In September 2001, National Park Service representatives participated in a 10-minute broadcast with KXAZ, the local Page, Arizona radio station 293.3 FM to discuss the Antelope Point Development Project and the EA process. National Park Service representatives announced the upcoming workshop and invited the public to attend.

The public workshop for scoping was held on September 14, 2001 in Page, Arizona. No formal presentation was made, but representatives from National Park Service and the Navajo Nation were present to answer questions and solicit comments on the Project. A total of 17 individuals attended the workshop. Interested parties were asked to submit written comments by October 14, 2001. One written comment was received during the public workshop, five comments were received by mail, and additional written comments from 86 individuals were received after October 14. A summary of issues derived from the comments is provided in Chapter 1, Section 1.6.

In addition, NNDED and/or National Park Service personnel attended regular meetings of six Navajo Nation Chapters. At each meeting, an overview of the Project and the EA process was presented. Discussion about the Project followed the presentation. The Chapters, dates, and attendance of the meetings are listed in Table 5-2; comments from the meetings are provided in Appendix B. A summary of the issues derived from the discussions is provided also in Chapter 1, Section 1.6.

<p align="center">TABLE 5-2</p> <p align="center">NAVAJO NATION CHAPTER MEETINGS (2001)</p>		
Chapter	Date	Attendance
Lechee Chapter	September 10	37
Shonto Chapter	September 19	50
Navajo Mountain Chapter	September 23	58
Gap/Bodaway Chapter	October 14	42
Inscription House Chapter	October 21	65
Coppermine Chapter	November 14	57

5.4 INDIVIDUALS INVOLVED WITH PREPARATION AND REVIEW OF THE DOCUMENT

National Park Service

Jacki Blais, Concessions Management Specialist, Glen Canyon NRA
 Kayci Cook Collins, Deputy Superintendent Glen Canyon NRA (2001)
 Liza Ermeling, Landscape Architect, Glen Canyon NRA
 Kathy Fleming, Chief of Concessions Management, Glen Canyon NRA
 Chris Goetze, Archeologist, Glen Canyon NRA

Norm Henderson, Research Coordinator, Glen Canyon NRA
Kitty L. Roberts, Superintendent, Glen Canyon NRA
Suzy Schulman, Environmental Specialist, Glen Canyon NRA
Chris Turk, NEPA Specialist, Intermountain Region, Denver Support Office
Pauline Wilson, American Indian Liaison, Glen Canyon NRA
Brian Wright, Outdoor Recreation Planner, Glen Canyon NRA

Navajo Nation

Thomas Boyd, Industrial Development Specialist, Division of Economic Development
Ed Chase, Financial Consultant
Eugenia Quintana, Environmental Specialist, Navajo Nation Environmental Protection Agency

URS Corporation

Jennifer Baker, Project Coordinator, Environmental Planner
Tom Granillo, PE, Water/Wastewater Treatment Specialist, Civil Engineer
A.E. (Gene) Rogge, PhD, Archeologist
Cindy Smith, Principal, Environmental Planning
Nancy VanDyke, Technical/Compliance Reviewer, Senior Consultant
Deb Vreeland, Project Management/Technical Advisor, NPS Initiative Leader

5.5 LIST OF ENVIRONMENTAL ASSESSMENT RECIPIENTS

Federal Agencies

Department of the Interior

Fish and Wildlife Service
National Park Service
 Grand Canyon National Park
 Canyon de Chelly National Monument
Bureau of Indian Affairs
Bureau of Reclamation

Indian Tribes

Navajo Nation

Chapters
 Coppermine Chapter
 Gap/Bodaway Chapter
 Inscription House Chapter
 Kaibto Chapter
 Lechee Chapter
 Navajo Mountain Chapter
 Shonto Chapter
Department of Fish and Wildlife
Department of Water Resources
Division of Economic Development

Environmental Protection Agency
Historic Preservation Department

State and Local Agencies

Arizona Department of Environmental Quality
Arizona Department of Public Safety
Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona Office of the Governor
City of Page
State Historic Preservation Office

Organizations

ARAMARK Sports and Entertainment, Inc.
Diné Medicineman's Association, Inc.
Glen Canyon Action Network
National Parks Conservation Association

Individuals

Due to the large number of individuals receiving this EA, their names have not been listed. A full list is available from the National Park Service, Glen Canyon NRA.

5.6 FUTURE INFORMATION

Updated information about various aspects of the Project will be distributed periodically via newsletters, mailings, the Glen Canyon NRA web site (www.nps.gov/glca/plan.htm), and regional and local news media. You may request a copy of or respond with comments on the EA using the addresses below.

Thomas Boyd
Navajo Nation Division of Economic Development
P.O. Box 663
Window Rock, AZ 86515

Superintendent, Glen Canyon NRA
ATTN: Antelope Point Marina and Resort Development Project
P.O. Box 1507
Page, Arizona 86040

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APPENDIX A
SPECIAL-STATUS SPECIES CONSULTATION LETTERS

APPENDIX B
NAVAJO NATION CHAPTER MEETINGS
MEETING NOTES