Adoption of an Interim 602(a) Storage Guideline

Final Environmental Assessment

U.S. Department of the Interior
Bureau of Reclamation
March 2004

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally sound manner in the interest of the American public.

Adoption of an Interim 602(a) Storage Guideline

Final Environmental Assessment

March 2004

Proposed agency action:	The Secretary of the Department of the Interior (Secretary of the Interior), acting through the Bureau of Reclamation, is proposing the adoption of an interim 602(a) storage guideline that will assist the Secretary in making a determination of the quantity of water considered necessary as of September 30 of each year, as required by Article II (1) of the 1970 Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs pursuant to the Colorado River Basin Project Act of September 30, 1968. This determination is important because the 602(a) storage requirement is the "trigger" point for making storage equalization releases from Lake Powell to Lake Mead. The proposed 602(a) storage guideline would remain in effect through calendar year 2016.
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TABLE OF CONTENTS

Tables

Figures

EXECUTIVE SUMMARY

The Secretary of the Interior, acting through the Bureau of Reclamation, is proposing the adoption of a 602(a) storage guideline that will assist the Secretary of the Interior in making a determination of the quantity of water considered necessary as of September 30 of each year, to assist in implementation of and as required by Article II (1) of the 1970 Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs (Long-Range Operating Criteria) pursuant to the Colorado River Basin Project Act of September 30, 1968. The proposed 602(a) storage guideline would remain in effect through calendar year 2016.

In Section 602(a) of the Colorado River Basin Project Act, Congress instructed the Secretary of the Interior (in consultation with representatives of the Colorado River Basin States) to make an annual determination of the quantity of water considered necessary to be in storage in Upper Basin reservoirs to provide protection to the Upper Division States of Colorado, New Mexico, Utah, and Wyoming against drought in the Colorado River Basin. This quantity of water is commonly referred to as "602(a) storage." This determination is important because the 602(a) storage requirement is the "trigger" point for making storage equalization releases from Lake Powell to Lake Mead. In years when projected storage in Upper Basin reservoirs is greater than 602(a) storage, and Lake Powell storage is greater than storage at Lake Mead, storage equalization releases are made. Such storage equalization releases are made to maintain, as nearly as practicable, the active storage in Lake Mead equal to the active storage in Lake Powell on September 30. In years when projected storage in the Upper Basin is less than 602(a) storage, such storage equalization releases from Lake Powell are not made and the objective is to maintain a release of a minimum of 8.23 million acre-feet as specified in the Long-Range Operating Criteria.

In July 2000, the Bureau of Reclamation issued a draft environmental impact statement on the proposed adoption of specific criteria, applicable for 15 years, under which surplus water conditions would be determined, and accordingly surplus water made available, for use by the Lower Division States of Arizona, California, and Nevada. During the public comment period on the document, the seven Colorado River Basin States submitted information to the Department of the Interior that contained a proposal for interim surplus criteria and a number of other related issues. This information was published in the Federal Register on August 8, 2000 (65 FR 48531-38). One component of the seven Colorado River Basin States' proposal is Section V, "Determination of 602(a) Storage in Lake Powell During the Interim Period," and reads as follows:

> During the interim period, 602(a) storage requirements determined in accordance with Article II (1) of the Criteria [Long-Range Operating Criteria] shall utilize a value of not less than 14.85 million acre-feet (elevation 3,630 feet) for Lake Powell (65 FR 48537).

The Proposed Action Alternative analyzed herein would adopt the Basin States' recommendation to limit 602(a) storage equalization releases when the storage level in Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30 as an added

consideration in the 602(a) determination through the year 2016. Under the Proposed Action Alternative, water year releases from Lake Powell would be the minimum objective release of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30.

The Bureau of Reclamation has historically utilized a modeling algorithm for calculating 602(a) storage volumes in the Colorado River Simulation System to determine when storage equalization releases from Lake Powell should be made. This algorithm incorporates the relevant factors listed in Article II (1) of the Long-Range Operating Criteria. The 602(a) storage algorithm has been utilized for over 20 years in modeling studies that involve simulation of the Colorado River. The 602(a) storage algorithm is also considered each year in the preparation of the Colorado River Annual Operating Plan. This modeling algorithm serves as the basis for the No Action Alternative.

Adoption of the Proposed Action Alternative could affect the operation of the Colorado River system (i.e., reservoir levels and river flow volumes) as a result of changes in the frequency and volume of storage equalization releases from Lake Powell to Lake Mead. The potentially affected environment includes the Colorado River and associated resources from Lake Powell to the Southerly International Boundary between the United States and Mexico. To determine the potential effects of the Proposed Action Alternative, simulation modeling of the Colorado River system was conducted. Modeling provides projections of potential future Colorado River system conditions (i.e., reservoir surface elevations, river flows, etc.). The modeling results allow a comparison of potential future conditions.

Model simulations of the Colorado River show that there is a low probability that the Proposed Action Alternative would result in any change in the operation of Colorado River reservoirs. Modeling results showed that there is a 12 percent probability that the Proposed Action Alternative would modify any storage equalization releases from Lake Powell to Lake Mead. Within this 12 percent probability range, effects were generally minimal. The Proposed Action Alternative resulted in no long-term effects and there were no effects observed beyond the year 2016.

Within the identified 12 percent probability that the Proposed Action Alternative could result in a modification of Lake Powell releases, the result would be a temporary increase in water storage at Lake Powell of 0.01 to 6.4 feet of water surface elevation, an increase of up to 407,000 acre-feet of storage (an increase of 2.8 percent). At Lake Mead there is a 12 percent probability that the Proposed Action Alternative could result in a temporary decrease in water surface elevation of 0.01 to 4.1 feet, a decrease of up to 413,000 acre-feet of storage (a decrease of 2.9 percent).

There is a 12 percent probability that there could be some minor changes in river flows in the Colorado River between Lake Powell and Lake Mead (through the Grand Canyon). However, changes to equalization releases would be made over multi-month time spans with the resulting flow regimes remaining well within the range of normal operating parameters of Glen Canyon Dam.

The Proposed Action Alternative would have no effect on water supply to the Upper Division States of Colorado, New Mexico, Utah, and Wyoming. There is a very small probability (1 percent) that the Proposed Action Alternative could reduce surplus deliveries to the Lower Division States of Arizona, California, and Nevada. Model simulations showed the Proposed Action Alternative would not increase the frequency or magnitude of future water shortages to the Lower Division States. The Proposed Action Alternative would have no effect on water deliveries to Mexico. The Proposed Action Alternative would have no effect on water rights and water use by Colorado River Indian Tribes. It was determined that the Proposed Action Alternative would have no effect on special status species in the affected environment. The Proposed Action Alternative could result in some short-term impacts to recreation resources at Lake Mead.

1 Introduction and Background

INTRODUCTION

Under certain conditions, the Secretary of the Interior, acting through the Bureau of Reclamation, releases additional water from Lake Powell to equalize storage between Lakes Powell and Mead. This occurs when storage in the Upper Basin exceeds the storage requirements pursuant to Section 602(a) of the Colorado River Basin Project Act of 1968, and when reservoir storage in Lake Powell is greater than Lake Mead. The 602(a) storage requirement is the "trigger" point for these storage equalization releases. When storage levels are above the 602(a) storage requirement, storage equalization releases may be required to equalize water storage in Lakes Powell and Mead.

When storage levels are below the 602(a) storage requirement, or when reservoir storage in Lake Powell is less than Lake Mead, water is conserved in Lake Powell by maintaining an objective to release a minimum of 8.23 million acre-feet. The objective release and the terms for making storage equalization releases are contained in the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Long-Range Operating Criteria).

On January 28, 2003 (68 FR 4230-31), the Secretary of the Interior announced that the Department of the Interior is considering the adoption of a specific interim guideline for making the annual 602(a) storage determination in response to comments received on the Colorado River Interim Surplus Criteria Draft Environmental Impact Statement from Governors' representatives of the seven Colorado River Basin States (Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming). Section 602(a) of the Colorado River Basin Project Act creates a consultative relationship between the Secretary of the Interior and each of the Upper and Lower Colorado River Basin States on 602(a) storage determination issues. This final environmental assessment (EA) analyzes the effects of their recommendation.

BACKGROUND

The Colorado River reservoir system was authorized by Congress to provide water resource benefits to the Southwest and consists of a number of mainstem storage reservoirs. The Colorado River Basin was geographically divided by the 1922 Colorado River Compact (Compact) into the Upper Basin above Lee Ferry, Arizona, and the Lower Basin downstream of this point. Congress has authorized reservoirs that provide roughly 30 million acre-feet of mainstem reservoir storage in each of these basins. In the Upper Basin, the majority of this storage is in Lake Powell located 15 miles upstream of the Compact division point at Lee Ferry.[1] Water is released from Lake Powell through Glen Canyon Dam to the Lower Basin. In the Lower Basin, the majority of this storage is in Lake Mead, the next reservoir below Lake Powell.

[1] "A point in the main stream of the Colorado River one mile below the mouth of the Paria River," 1922 Colorado River Compact, Article II (e).

The operation of the Colorado River reservoir system, including Glen Canyon Dam, is carried out consistent with applicable Federal law and other provisions of the *Law of the River*, a combination of Federal and State statutes, interstate compacts, court decisions and decrees, an international treaty, contracts with the Secretary of the Interior, operating criteria, regulations, and administrative decisions.[2] The cornerstone of the *Law of the River* is the Compact. Article III (d) of the Compact contains a downstream delivery requirement from the Upper Division States of Colorado, New Mexico, Utah, and Wyoming to the Lower Division States of Arizona, California, and Nevada.[3] The Upper Division States also have a requirement to share in the delivery of water to Mexico as specified in Article III (c) of the Compact.[4]

The Colorado River Basin Project Act of 1968 required the Secretary of the Interior to adopt operating criteria for the coordinated long-range operation of Colorado River reservoirs by January 1, 1970. This requirement led to the adoption of the Long-Range Operating Criteria (see Attachment A) which address operation of the Colorado River reservoirs in compliance with requirements set forth in the Compact, Colorado River Storage Project Act, Boulder Canyon Project Act, Colorado River Basin Project Act, the United States and Mexico Water Treaty, and other applicable Federal laws. The purpose of the Long-Range Operating Criteria is to provide for the coordinated long-range operation of the storage reservoirs of the Colorado River Basin. The Long-Range Operating Criteria established the objective to release a minimum of 8.23 million acre-feet from Lake Powell in years when equalization releases are not required or storage is below the 602(a) trigger level.

The Long-Range Operating Criteria are administered consistent with applicable Federal laws, the Mexican Water Treaty, interstate compacts, and decrees relating to the use of the waters of the Colorado River. Article II(4) of the Long-Range Operating Criteria states, "Releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact." Nothing in this final EA or the Proposed Action Alternative modifies this, or any other provision, of the Long-Range Operating Criteria in any manner.

The Colorado River Basin Project Act of 1968 also requires the development of an annual plan of operation. Accordingly, each year, the Secretary of the Interior establishes an Annual Operating Plan for the Colorado River reservoir system. The Annual Operating Plan describes how the Bureau of Reclamation will manage the reservoirs over a 12-month period. In

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[2] See Section 1.3.2 of the Colorado River Interim Surplus Criteria Final Environmental Impact Statement (December 2000) for more information on the *Law of the River*.

[3] Article III (d) of the Compact requires that "the States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October."

[4] Article III (c) states, "If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d)."

compliance with applicable Federal law, the Bureau of Reclamation consults annually with the Colorado River Basin States, Indian tribes, and other interested parties in the development of the Annual Operating Plan. The Annual Operating Plan contains determinations by the Secretary of the Interior regarding the amount of Lower Basin deliveries (surplus, normal, or shortage), and the Upper Basin storage level required by Section 602(a) of the Colorado River Basin Project Act. The Annual Operating Plan also addresses annual deliveries to Mexico pursuant to the 1944 United States Mexico Water Treaty. The determination of Upper Basin Storage, required by Section 602(a), is the focus of this final environmental assessment.

602(a) STORAGE REQUIREMENT DETERMINATION

As discussed in the Introduction, storage equalization releases from Lake Powell are required when water storage levels in the Upper Basin exceed the 602(a) storage requirement in the Colorado River Basin Project Act, and when reservoir storage in Lake Powell is greater than Lake Mead. Conversely, the objective is to maintain a release of a minimum of 8.23 million acre-feet in years when storage levels fall below 602(a) storage requirements, or when reservoir storage in Lake Powell is less than Lake Mead. This 602(a) storage requirement is the "trigger" point for releasing water from Lake Powell to Lake Mead to equalize storage between the two reservoirs as provided by law.

The 602(a) storage requirement is not a fixed volume of water. It changes with time as water use increases. As more of the Colorado River water supply (runoff) is consumed within the Upper Basin States, more storage needs to be reserved to protect the Upper Basin from potential droughts. At some point in the future, when the Upper Basin has developed its full Colorado River water allocation, the entire capacity of Lake Powell will be needed to meet 602(a) storage requirements. At that point, storage equalization releases from Lake Powell would not be made under any circumstance.

From an operational standpoint, Lake Powell (and to a lesser extent other major reservoirs upstream of Lake Powell) provides the water storage to supply the required flows of the Colorado River to the Lower Basin. Without significant water storage in the Upper Basin, the Upper Basin States would have to curtail water use at the worst possible time (during drought years) to meet downstream delivery requirements. Lake Powell, being the most significant water storage facility in the Upper Basin, can thus be seen as an "insurance policy" or a "savings account" to be used against periodic droughts in the Southwest.[5]

The amount or degree of protection is related to the volume of water in storage in Upper Basin reservoirs, primarily Lake Powell. In the Colorado River Basin Project Act, Congress instructed the Secretary of the Interior (in consultation with representatives of the Colorado River Basin

[5] In its simplest form, managing water is much like managing a household budget. Income, savings, and expenses have to balance. Since income and expenses may vary, savings are needed to get through the lean times. In water resources the parallels are supply, storage, and use. These parameters must also balance. The 602(a) storage requirement is the amount of storage (savings) needed to weather the vagaries of water supply (income) and use (expense).

States) to make an annual determination of the quantity of water considered necessary to be in Upper Basin storage to provide this drought protection. This annual determination is made in the Annual Operating Plan. The relevant factors listed in the Long-Range Operating Criteria are used in making the determination. These relevant factors include historic streamflows, the most critical period of record, future Upper Basin depletion estimates, historic reports on hydrologic probabilities, and the necessity to avoid impairment of Upper Basin uses. This determination is important because when projected storage in the Upper Basin mainstem reservoirs is greater than this 602(a) storage requirement, releases from Lake Powell are often made that exceed 8.23 million acre-feet. The purpose of these additional releases is to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell.[6] In years when projected Upper Basin mainstem storage is less than the 602(a) storage requirement, storage equalization releases from Lake Powell are not made, and the objective is to maintain a release of a minimum of 8.23 million acre-feet. This volume of storage equalization releases from Glen Canyon Dam affects storage in both Lakes Powell and Mead.

COLORADO RIVER INTERIM SURPLUS GUIDELINES AND RELATED ACTIONS

On December 7, 1999 (64 FR 68373), the Department of the Interior proposed to develop specific criteria to identify those circumstances under which water available for beneficial consumptive use in the States of Arizona, California, and Nevada (Lower Division States or Lower Basin) could exceed 7.5 million acre-feet. In July 2000, the Bureau of Reclamation issued a draft environmental impact statement (DEIS) on the proposed adoption of specific criteria, applicable for 15 years, under which surplus water conditions would be determined and accordingly surplus water made available for use by the Lower Division States of Arizona, California, and Nevada. During the public comment period on the document, the seven Colorado River Basin States submitted information to the Department of the Interior that contained a proposal for interim surplus criteria and a number of other related issues. This information was published in the Federal Register on August 8, 2000 (65 FR 48531-38). One component of the Colorado River Basin States' proposal is Section V, "Determination of 602(a) Storage in Lake Powell During the Interim Period," and reads as follows:

> During the interim period, 602(a) storage requirements determined in accordance with Article II (1) of the Criteria [Long-Range Operating Criteria] shall utilize a value of not less than 14.85 million acre-feet (elevation 3,630 feet) for Lake Powell (65 FR 48537).

The purpose of this proposal was to have similar objective criteria for the operation of both Lake Powell and Lake Mead. The Governors' representatives believed that their proposal would further the coordinated operation of the two reservoirs. In December 2000, the Bureau of Reclamation issued a final environmental impact statement (FEIS) on the proposed adoption of specific criteria, applicable for 15 years, under which surplus water conditions would be

[6] Consistent with Article II (3) of the Long-Range Operating Criteria and Section 602(a) (3) of the 1968 Colorado River Basin Project Act.

determined and accordingly surplus water made available for use by the Lower Division States of Arizona, California, and Nevada. The preferred alternative in the Colorado River Interim Surplus Criteria FEIS was based in large part on the Colorado River Basin States' proposal, but as noted in the FEIS, the preferred alternative did not contain all of the specific elements of the Basin States' proposal.

On January 16, 2001, the Secretary of the Interior signed the Record of Decision for the Colorado River Interim Surplus Guidelines. The FEIS and the Record of Decision did not consider or implement Section V of the Colorado River Basin States' proposal (Basin States' proposed 602(a) storage level). While the Department of the Interior recognized the seven Governors' desire for objective equalization criteria, this issue was not analyzed in the DEIS and accordingly, the FEIS did not include any analysis of the proposed 602(a) storage requirements.

Representatives of the Colorado River Basin States have continued to express an interest in having the Basin States' proposed 602(a) storage level adopted by the Secretary of the Interior through the year 2016. Adoption of this objective guideline would protect Upper Basin storage against the potential drawdown of Colorado River reservoir storage that could occur due to potential continued surplus deliveries from Lake Mead to the Lower Division States through the year 2016.

PURPOSE AND NEED

The Record of Decision for the Colorado River Interim Surplus Guidelines adopted specific objective elevation levels at Lake Mead at which surplus water (i.e., amounts to satisfy beneficial consumptive use in excess of 7.5 million acre-feet) could be delivered to the Lower Division States from Lake Mead through the year 2016. The purpose of the proposed 602(a) storage guideline is to adopt a similar objective elevation level in Lake Powell during the time period that the Colorado River Interim Surplus Guidelines are in place. The Colorado River Interim Surplus Guidelines are applicable through 2016 and the proposed 602(a) storage guideline is proposed to remain in effect through that same period.

The need for the proposed 602(a) storage guideline arises because of the potential for additional surplus deliveries to the Lower Division States during the period through 2016 to further draw down Lake Powell (through storage equalization releases), thus affecting Upper Basin resources such as water supply, recreation, and power generation. Just as the Colorado River Interim Surplus Guidelines provide a lower limit at Lake Mead for declaration of surplus through the year 2016, the proposed 602(a) storage guideline would provide a lower limit for annual releases of water in excess of the minimum objective release of 8.23 million acre-feet from Lake Powell through the year 2016. The action is therefore needed to provide for coordinated operation of these two reservoirs on the Colorado River.

DOCUMENTS INCORPORATED BY REFERENCE

A considerable amount of environmental information has been obtained and environmental analyses conducted concerning operation of the Colorado River system. Much of this

information is contained in various documents prepared pursuant to procedural requirements of the National Environmental Policy Act and Endangered Species Act. These documents have been previously distributed to interested parties. This final environmental assessment incorporates, by reference, an analysis contained in parts or all of several documents. The documents described below are available for public inspection, by request, at Bureau of Reclamation offices in Salt Lake City, Utah, and Boulder City, Nevada. Many of the documents can be found on the Bureau of Reclamation's web pages at either http://www.usbr.gov/lc/region/lcrivops.html or http://www.usbr.gov/uc/library/.

- Biological Assessment for Proposed Interim Surplus Criteria, Secretarial Implementation Agreements for California Water Plan Components and Conservation Measures, August 30, 2000

- Biological Opinion on Proposed Interim Surplus Criteria, Secretarial Implementation Agreements for California Water Plan Components and Conservation Measures, December 2000

- Biological and Conference Opinion on Lower Colorado River Operations and Maintenance, April 1997

- Biological Assessment on Transboundary Effects for Proposed Interim Surplus Criteria, December 2000

- Colorado River Interim Surplus Criteria FEIS, December 2000

- Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement, October 2003

- Description and Assessment of Operations, Maintenance, and Sensitive Species of the Lower Colorado River (Biological Assessment), August 1996

- Final Biological Opinion, Operation of Glen Canyon Dam as the Modified Low Fluctuating Flow Alternative, December 1994

- Final Programmatic Environmental Assessment for Rulemaking for Offstream Storage of Colorado River Water and Development and Release of Intentionally Created Unused Apportionment in the Lower Division States, October 1999

- Glen Canyon Adaptive Management Work Group Charter, December 8, 1998

- Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions FEIS, October 2002.

- Operation of Glen Canyon Dam FEIS, March 1995

- Proposed Experimental Releases From Glen Canyon Dam and Removal of Non-Native Fish Environmental Assessment, September 2002

- Quality of Water, Colorado River Basin, Progress Report No. 20, January 2001

- Record of Decision on the Operation of Glen Canyon Dam, October 8, 1996

- Record of Decision for the Colorado River Interim Surplus Guidelines, January 16, 2001

2 Description of Alternatives

There are two alternatives considered in this final environmental assessment, the No Action Alternative and the Proposed Action Alternative. These two alternatives differ by the method in which the 602(a) storage requirement is calculated. As discussed in the Introduction, storage equalization releases from Lake Powell are linked to 602(a) storage requirements. Storage equalization releases are not scheduled in years when Upper Basin mainstem storage falls below the 602(a) storage requirement.

NO ACTION ALTERNATIVE

The Bureau of Reclamation has historically utilized a modeling algorithm for calculating 602(a) storage volumes in the Colorado River Simulation System (CRSS) to determine when storage equalization releases from Lake Powell should be made.[7] This algorithm incorporates the relevant factors listed in Article II (1) of the Long-Range Operating Criteria. This algorithm will be referred to in this final environmental assessment as the "602(a) storage algorithm." The 602(a) storage algorithm has been utilized for over 20 years in modeling studies that involve simulation of the Colorado River. The 602(a) storage algorithm is considered in the preparation of each year's Annual Operating Plan.

The 602(a) storage algorithm uses the driest 12-year historic critical period of inflows into Lake Powell (1953-1964) to represent a period of extremely dry future hydrology.[8] Releases from Glen Canyon Dam during this modeled future period are assumed to be 8.23 million acre-feet annually. Evaporation from Upper Basin mainstem storage reservoirs is included in the calculation. Upper Basin uses (depletions) are assumed to increase from current levels according to projections provided by each of the Upper Basin States. Each of the above is a component in an equation that produces the 602(a) storage volume. On a 12-year cumulative basis, the equation adds inflow and subtracts depletions, evaporation, and releases to obtain a 602(a) storage volume. The exact mathematical expression for the 602(a) storage algorithm is included as Attachment B.

Each year the model performs this 12-year mass balance in the Upper Basin to determine the storage volume necessary in the Upper Basin to assure deliveries from Lake Powell to the Lower Basin under the Compact without impairing Upper Basin uses. This approach assumes that the next 12 years have the inflow hydrology of the critical period. Since Upper Basin uses (depletions) have generally increased with time, the storage required under 602(a) in the Upper Basin has also increased with time. With increased uses, more water is needed in storage to assure required deliveries to the Lower Basin without the impairment of Upper Basin uses. Eventually it is expected that later in this century, when the Upper Basin has developed its full

[7] CRSS is a modeling system that simulates operation of the Colorado River reservoir system. Additional information on the CRSS is found in Chapter 3.

[8] Use of a "critical period of record" in determining 602(a) storage requirements is one of the relevant factors described in Section 602(a) of the Colorado River Basin Project Act and Article II (1) of the Long-Range Operating Criteria.

allocation from the Colorado River, the computed 602(a) storage level will approach the entire reservoir capacity of the Upper Basin mainstem storage reservoirs.

Figure 2.1 depicts prospective 602(a) storage as calculated using the 602(a) storage algorithm. The 602(a) storage algorithm represents the baseline condition in this final environmental assessment and is the best representation of the No Action Alternative.

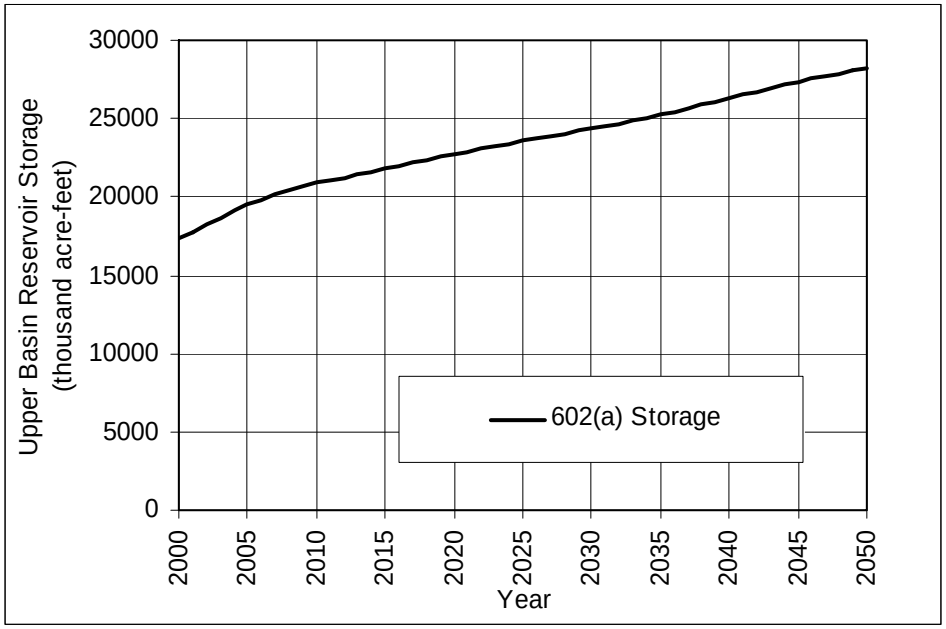

Figure 2.1.—Baseline condition – No Action Alternative.

The 602(a) storage algorithm compares computed 602(a) storage with the sum of the active storage of the four Upper Basin mainstem reservoirs: Flaming Gorge Reservoir, Blue Mesa Reservoir, Navajo Reservoir, and Lake Powell. In years when actual combined storage in these Upper Basin Reservoirs on September 30 is projected to be below the computed 602(a) storage level (the line in Figure 2.1), the objective is to maintain a release of a minimum of 8.23 million acre-feet. Conversely, when actual combined storage exceeds the 602(a) storage level computed by the algorithm, and when storage in Lake Powell is greater than Lake Mead, storage equalization releases are made from Lake Powell to equalize, as nearly as practicable, the storage in Lake Powell with that of Lake Mead. Under the No Action Alternative, storage equalization releases are never made when the combined projected storage of Flaming Gorge Reservoir, Blue Mesa Reservoir, Navajo Reservoir, and Lake Powell is below the 602(a) storage calculation shown in Figure 2.1 on September 30 of any given year.

PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative would adopt the Basin States' recommendation to limit 602(a) storage equalization releases when the storage level in Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30 as an added consideration in the 602(a) determination through the year 2016. Under the Proposed Action Alternative, water year releases from Lake Powell would be made with the objective to release a minimum of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30.

The Proposed Action Alternative analyzed in this final environmental assessment also uses the 602(a) storage algorithm utilized in the No Action Alternative (as depicted in Figure 2.1). The only difference between the Proposed Action Alternative and the No Action Alternative is that the 14.85 million acre-feet (elevation 3,630) requirement is superimposed.

Because the 602(a) storage algorithm is still active in modeling the Proposed Action Alternative, there is not an "on" or "off" switch for limiting storage equalization releases that is dependant solely upon whether Lake Powell is above or below 14.85 million acre-feet (elevation 3,630 feet). Sometimes, the 14.85 million acre-feet (elevation 3,630 feet) requirement controls whether storage equalization releases are restricted and annual releases are limited to 8.23 million acre-feet, and at other times the 602(a) storage algorithm controls this determination.

In the Proposed Action Alternative, in the years 2004 through 2008, the Lake Powell 14.85 million acre-feet (elevation 3,630 feet) requirement tends to be the controlling component in limiting storage equalization releases. Beyond the year 2008, as Upper Basin depletions increase, the 602(a) storage algorithm tends to control when storage equalization releases are limited. Since the 602(a) algorithm considers storage in not only Lake Powell, but upstream reservoirs as well, and because the degree of future increases in Upper Basin depletions is not exactly known, there is no precise year in the future that can be identified when the 602(a) storage algorithm would become the controlling factor.

In modeling the Proposed Action Alternative, this concept is important because there could be times when Lake Powell would have more than 14.85 million acre-feet in storage, but the combined storage in Lake Powell, Flaming Gorge, Blue Mesa, and Navajo Reservoirs is still less than 602(a) storage as computed by the algorithm.[9] Conversely, there could be times in which Lake Powell would have less than 14.85 million acre-feet in storage, but the combined storage of Upper Basin mainstem reservoirs is more than the calculated 602(a) storage as computed by the algorithm.[10]

[9] In this case, storage equalization releases would not be made under either the No Action or Proposed Action Alternatives.

[10] In this case, storage equalization releases would be made under the No Action Alternative, but not under the Proposed Action Alternative.

RELATIONSHIP OF PROPOSED ACTION ALTERNATIVE TO MINIMUM OBJECTIVE RELEASE FROM LAKE POWELL

Under the No Action and Proposed Action Alternatives, the objective to release a minimum of 8.23 million acre-feet at Lake Powell, as specified in the Long-Range Operating Criteria, would be maintained. The proposed Federal action does not modify the Long-Range Operating Criteria in any manner.

3 Affected Environment and Environmental Consequences

This chapter describes the resources that are related to Colorado River reservoir operations and the expected or predicted effects of the Proposed Action and No Action Alternatives on these resources. The affected resources include water, fish and wildlife, endangered and other special status species, cultural resources, recreation, hydropower, air quality, and others. The indicators used for analyzing impacts on these resources are the same as those used in the Colorado River Interim Surplus Criteria FEIS.

INTRODUCTION

The analysis of potential effects for each issue considered is based primarily upon the results of computer modeling based on historic and predicted hydrologic information. Following the identification of conditions important to each issue, the potential effects of various system conditions over the general range of their possible occurrence (as identified by the range of modeling output for various parameters) are identified for each issue. The potential effects of the Proposed Action Alternative are then presented in terms of the incremental differences in probabilities (or projected circumstances associated with a given probability) between the No Action and Proposed Action Alternatives.

This environmental assessment addresses the impacts of the Proposed Action Alternative through the year 2016. In order to determine whether the Proposed Action Alternative would have any effects beyond the year 2016, the analysis and modeling in this document extended through the year 2050.

POTENTIALLY AFFECTED AREA

Adoption of the Proposed Action Alternative could affect the operation of the Colorado River system (i.e., reservoir levels and river flow volumes) as a result of changes in the frequency and volume of storage equalization releases from Lake Powell to Lake Mead. The Colorado River Basin is shown in Figure 3.1.

The operation of reservoirs above Lake Powell is independent of Glen Canyon Dam operations. Because of this, the upstream limit of the potentially affected area is the full pool elevation of Lake Powell.[11] The downstream limit of the potentially affected area within the United States is the Southerly International Boundary between the United States and Mexico.

[11] While calculations of Upper Basin 602(a) storage in the 602(a) storage algorithm account for quantities of water in reservoirs above Lake Powell, operations at these upstream reservoirs are not altered by 602(a) storage considerations.

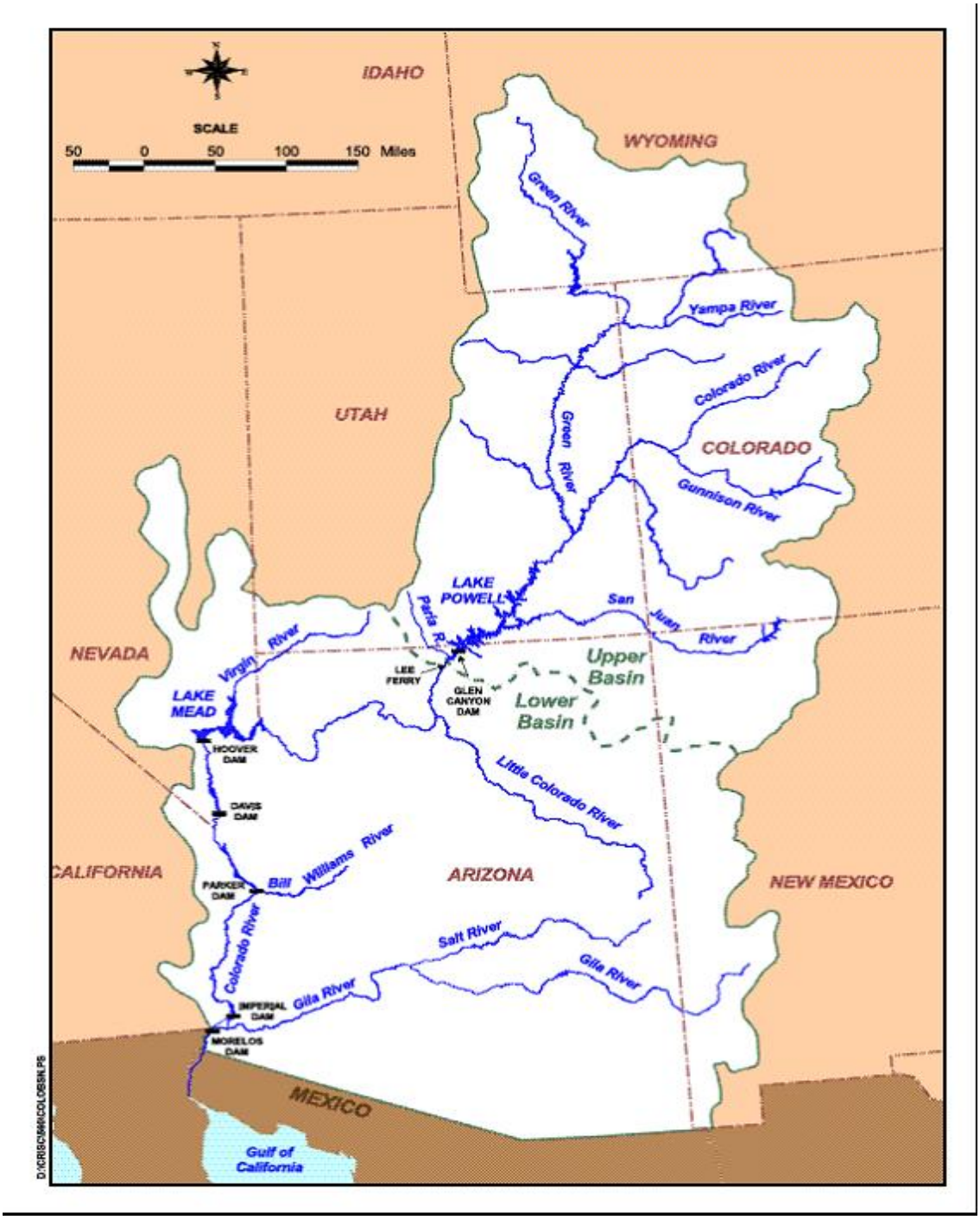

Figure 3.1.—Map of the Colorado River Basin.

The affected environment in the environmental assessment is coincident with the affected environment in the Colorado River Interim Surplus Criteria FEIS (Section 3.2). This environmental assessment addresses the same Colorado River segments that were addressed in the Colorado River Interim Surplus Criteria FEIS. These segments include Lake Powell, the Colorado River from Glen Canyon Dam to Lake Mead, Lake Mead, and the Colorado River from Hoover Dam to the Southerly International Boundary.

RIVER SYSTEM OPERATION

Extensive information on the operation of the Colorado River system, including the operation of Glen Canyon Dam and Hoover Dam, is contained in the Colorado River Interim Surplus Criteria FEIS at Sections 3.3.1.1 and 3.3.1.2. This analysis incorporates, by reference, this information. The reader should refer to this document for detailed information on reservoir operations in the Colorado River Basin.

RIVER SIMULATION MODELING

To determine the potential effects of the Proposed Action Alternative, modeling of the Colorado River system was conducted. Modeling provides projections of potential future Colorado River system conditions (i.e., reservoir surface elevations, river flows, etc.). The modeling results allow a comparison of potential future conditions under the Proposed Action and No Action Alternatives. As such, much of the analyses contained within this final environmental assessment are based upon potential effects of changed flows, water deliveries, and water levels within Colorado River reservoirs.

Section 3.3.3 of the Colorado River Interim Surplus Criteria FEIS describes the modeling approach used to analyze the Colorado River system. The same modeling approach using the CRSS with the RiverWare modeling package and the Indexed Sequential Method has been used in this analysis. The CRSS-RiverWare model includes updated information on water use and hydrology that has been revised since the issuance of the Colorado River Interim Surplus Criteria FEIS. The updated model was used in the Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions FEIS released in October 2002. The updated model reflected the best and most current simulation of the Colorado River system. The model configuration used for the Implementation Agreement Action Alternative in the Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions FEIS was used in this analysis.

The river simulation performed in this analysis uses the Indexed Sequential Method.[12] The use of the Indexed Sequential Method facilitates an evaluation over a broad range of possible future hydrologic conditions, accounting for periods of wet, dry, and average inflow conditions. Each future inflow scenario is generated from the historical natural flow record by "cycling" through that record. For example, the first simulation assumes that the inflows for 2003 through 2050

[12] See Section 3.3.3.5 of the Colorado River Interim Surplus Criteria FEIS for more information on the Indexed Sequential Method.

will be the 1906 through 1953 record; the second simulation assumes that the inflows for 2003 through 2050 will be the 1907 through 1954 record, and so on. As the method progresses, the historical record is assumed to "wrap-around" (i.e., after 1990 the record reverts back to 1906), yielding a possible 85 different inflow scenarios. There is no way to predict future inflow to Colorado River Reservoirs, and subsequently predict with certainty that Colorado River Reservoir conditions will be at specific levels at future dates. The Indexed Sequential Method allows an analysis of a wide range of inflow scenarios ranging from dry to average to wet. The result of the Indexed Sequential Method is a set of 85 separate simulations (referred to as "traces") for each operating criterion that is analyzed. This enables an evaluation of the respective criteria over a broad range of possible future hydrologic conditions using standard statistical techniques. Statistics on the probability of hydrologic events occurring in the future can be generated from model results. Differences between alternatives can also be analyzed.

CRSS model simulations were made from January 2003 through December 2050. Modeling using CRSS was performed to analyze changes to the Colorado River system from Lake Powell to Mexico potentially caused by implementing the Proposed Action Alternative. The modeling assumptions common to all model runs are listed in Section 2.3 of Appendix G of the Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions FEIS.

The 602(a) storage algorithm, explained in Chapter 2, is used to compute 602(a) storage in the CRSS model on a year-by-year basis. In modeling the No Action Alternative, storage equalization releases are never made when the combined storage of Flaming Gorge Reservoir, Blue Mesa Reservoir, Navajo Reservoir, and Lake Powell is below the level computed by the 602(a) storage algorithm for September 30 of any given year. The exact mathematical expression for the 602(a) storage algorithm is included as Attachment B.

To model requirements of the Proposed Action Alternative, the "equalization rule" in CRSS was modified. This modified equalization rule "turns off" or reduces equalization releases when projected end-of-water year Lake Powell storage is less than 14.85 million acre-feet through the year 2016, regardless of what has been computed by the 602(a) storage algorithm. Under this new rule, equalization releases are never made if they would cause Lake Powell storage to end a water year below 14.85 million acre-feet. When Lake Powell storage is above 14.85 million acre-feet, the 602(a) storage algorithm is still in place in the Proposed Action Alternative. The result is that in modeling the Proposed Action Alternative, storage equalization releases are never made if the combined storage of Flaming Gorge Reservoir, Blue Mesa Reservoir, Navajo Reservoir, and Lake Powell is below the quantity computed by the 602(a) storage algorithm, or if Lake Powell storage is below 14.85 million acre-feet on September 30 of any given year.

The CRSS model was run to model the period from January 2003 through December 2050. Initial reservoir conditions used in the model were those forecasted from the Bureau of Reclamation's October 2002 monthly operational model (24-Month Study).

The modeling in this final environmental assessment assumed that the Quantification Settlement Agreement (and its related documents) would be executed, that the water transfers and

exchanges between the California agricultural water agencies and Metropolitan Water District of Southern California would take place, and that all benchmarks contained in Section 5C of the Colorado River Interim Surplus Guidelines would also be met. On October 10, 2003, the Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement was approved by the Secretary of the Interior confirming the model assumption in this regard. While the modeling used in this final environmental assessment was performed before October 10, 2003, the model assumptions are consistent with events that have taken place since, specifically the completion of the Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement. In the modeling, surplus deliveries to the Lower Division States are made consistent with Article XI, Section 2, of the Colorado River Interim Surplus Guidelines.

The Colorado River Interim Surplus Guidelines contain benchmarks which California must meet in order that surplus determinations are made under Article XI, Section 2. If, in the event that these benchmarks are not achieved, surplus determinations will be made using the 70R strategy.[13] Because of this possibility, additional simulation modeling was performed where surplus determinations for use by the Lower Division States of Arizona, California, and Nevada were made using the 70R strategy under both the Proposed Action and No Action Alternatives. This sensitivity analysis was performed to assure that there would not be greater effects caused by the proposed Federal action should the required benchmarks not be met and the 70R strategy be used as the surplus trigger in the period through 2016.

When both the No Action and Proposed Action Alternatives were modeled using the 70R trigger for surplus, differences in model output between the No Action and Proposed Action Alternatives decreased for all resource areas considered in this assessment. Thus, the modeling, in assuming that California meets required benchmarks contained in the Colorado River Interim Surplus Guidelines, assures that the effects of the proposed Federal action will not be understated (even if required benchmarks are not met in the future). A synopsis of modeling results using the 70R strategy is contained in Attachment C.

MODELING RESULTS

This section presents general and specific discussions of the Colorado River system operation modeling results. The following topics are used to address the potentially affected river system components:

- Lake Powell water levels
- River flows between Glen Canyon Dam and Lake Mead
- Lake Mead water levels
- River flows between Hoover Dam and Imperial Dam
- River flows between Imperial Dam and Morelos Dam

[13] The 70R strategy is outlined in Section 2.3.1.2 of the Colorado River Interim Surplus Criteria FEIS.

As noted previously, the potentially affected portion of the Colorado River system extends from Lake Powell to the Southerly International Boundary. Although Lakes Mohave and Havasu are within the potentially affected area, it has been determined that the Proposed Action Alternative would have no effect on the operation of these facilities. The operation of Lakes Mohave and Havasu is pursuant to monthly operating target elevations that are used to manage the storage and release of water and power production at these facilities. Under the respective target elevations, the water level fluctuation is approximately 14 feet for Lake Mohave and 4 feet for Lake Havasu. It is expected that Lakes Mohave and Havasu will continue to be operated under the current respective monthly target elevations.

OVERVIEW OF MODELING RESULTS

Examination of model output for the period through 2016 shows that in 75 of the 85 traces, there was no difference between the No Action and Proposed Action Alternatives. In the other ten traces, some differences to the Colorado River system were observed. In general terms, this outcome can be interpreted as there being only a 12 percent[14] probability that the Proposed Action Alternative will have any effect whatsoever upon the Colorado River system.

Modeling output also shows that there were no differences between the No Action and Proposed Action Alternatives beyond the year 2016 for all 85 traces. Modeling was performed through the year 2050 for analysis of long-term impacts. Because there were no effects after the year 2016, the analysis and effects presented will be limited to the time frame between 2004 and 2016. Effects upon specific resources shall be presented using statistical techniques similar to those used in the Colorado River Interim Surplus Criteria FEIS.

LAKE POWELL WATER LEVELS

The Proposed Action Alternative could have some impact on water surface elevations at Lake Powell[15], during the period through 2016, due to changes in storage equalization releases. Figure 3.2 shows 90th, 50th, and 10th percentile values for Lake Powell end-of-July water surface elevations for the No Action and Proposed Action Alternatives. The 90th and 10th percentile lines bracket the range where 80 percent of the water levels are likely to occur. The lines for the No Action and Proposed Action Alternatives are indistinguishable for the 90th and 10th percentile. For the 50th percentile line, there is only a very slight difference between the No Action and Proposed Action Alternatives.

[14] Derived by dividing the ten traces with differences by the eighty five possible traces.
[15] A complete description of Lake Powell and Glen Canyon Dam can be found in Section 3.3.4.2 of the Colorado River Interim Surplus Criteria FEIS.

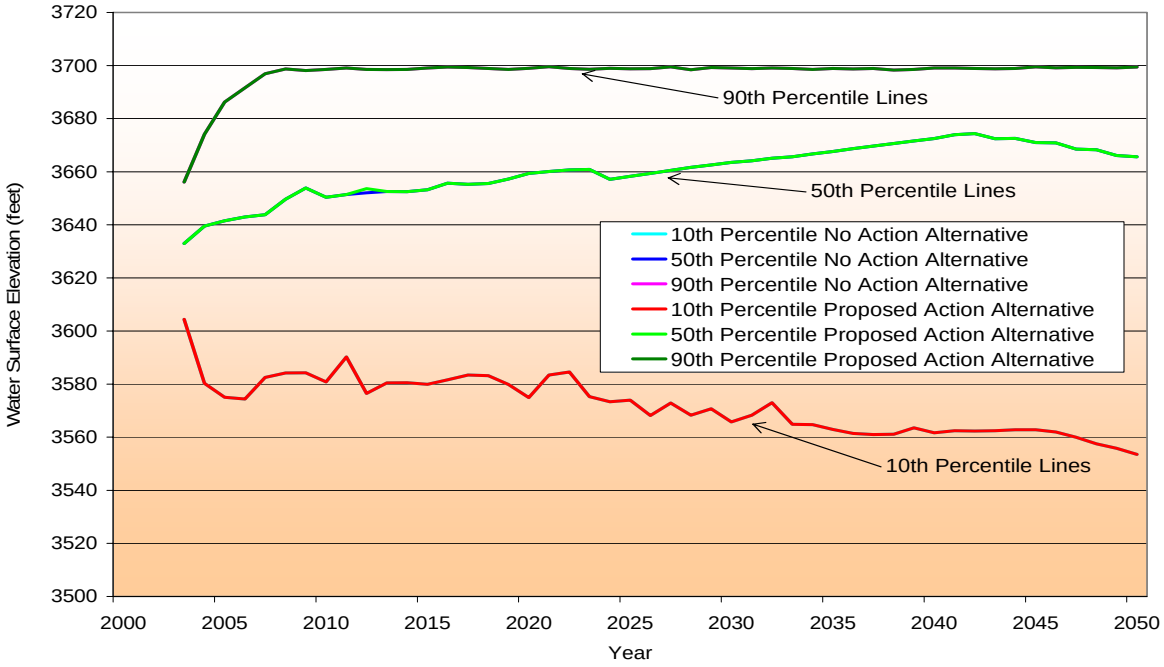

Figure 3.2.—Lake Powell end-of-July water surface elevations for the No Action and Proposed Action Alternatives.

Only by analysis of individual traces can appreciable differences between the No Action and Proposed Action Alternatives be found. In comparing the two alternatives, ten out of 85 traces show differences in storage equalization releases from Lake Powell. This equates to about a 12 percent probability that the Proposed Action Alternative would have any effect on Lake Powell storage. Two traces show impacts that last for approximately 10 years, two traces show impacts that last for approximately a year-and-a-half, and five traces show impacts that last three months or less.

Table 3.1 depicts the greatest magnitude of change for these ten traces for water surface elevation. For Lake Powell, six of the ten traces with change show maximum differences that are less than 1 foot. Two of the traces show maximum changes that are between 1 and 3 feet. Two traces at Lake Powell show a change greater than 3 feet.

Trace (first historic year for trace)	Maximum change (increase) in Lake Powell water surface elevation
12 (1918)	0.2 feet
30 (1936)	1.2 feet
37 (1943)	0.1 feet
49 (1955)	2.1 feet
56 (1962)	3.2 feet
62 (1968)	0.1 feet
68 (1974)	6.4 feet
69 (1975)	0.5 feet
71 (1977)	0.6 feet
81 (1987)	0.01 feet

Table 3.1.—Summary of model traces where changes to water surface elevations at Lake Powell occur

Figure 3.3 depicts Lake Powell water surface elevations for Trace 56[16] (which has 1962 hydrology in the first year) for the No Action and Proposed Action Alternatives. In this trace hydrologic conditions would result in different storage equalization releases, with Lake Powell being slightly higher in elevation for a number of years.

[16] The reader will notice repeated references to Trace 56 throughout this document. Trace 56 is one of the traces that show the most change between the No Action and Proposed Action Alternatives. While it is not likely that the changes seen in Trace 56 will occur, it is a useful example to present possible changes that could occur to equalization releases (and subsequent changes in storage at Lakes Powell and Mead) under the Proposed Action Alternative.

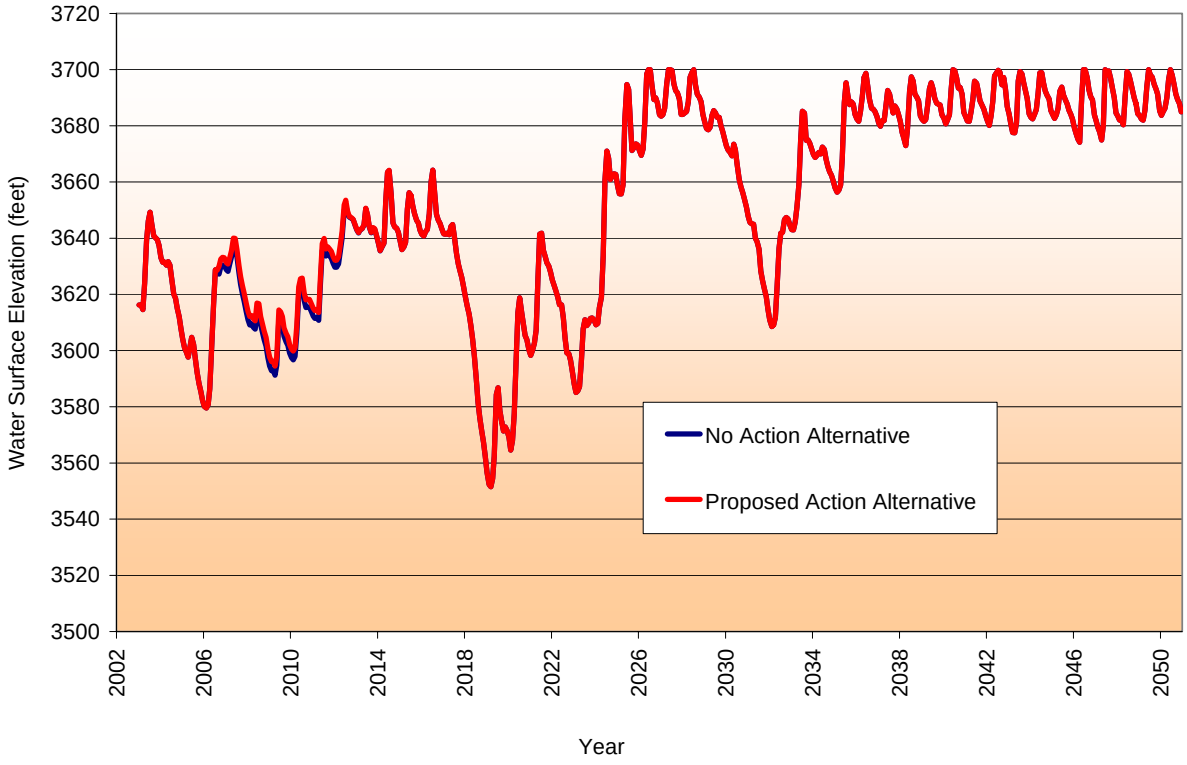

Figure 3.3.—Lake Powell water surface elevations for Trace 56 for the No Action and Proposed Action Alternatives.

Given that 75 out of the 85 model output traces show no difference to Lake Powell water surface elevations between the No Action and Proposed Action Alternatives, it is not likely that the Proposed Action Alternative will have an effect upon Lake Powell. It is possible, however, that under some hydrologic scenarios there could be some effect, with the elevation of Lake Powell being slightly higher under the Proposed Action Alternative than under the No Action Alternative.

RIVER FLOWS BETWEEN GLEN CANYON DAM AND LAKE MEAD

The river flows between Glen Canyon Dam and Lake Mead result from controlled releases from Glen Canyon Dam (Lake Powell) and include gains from tributaries in this reach of the river. The most significant gains from perennial streams include inflow from the Little Colorado River and Paria River. However, inflow from these streams is concentrated over very short periods of time, and on average, make up approximately two percent of the total annual flow in this reach of the river.

Figure 3.4 provides a comparison of the relative frequency of occurrence of annual releases from Lake Powell under the No Action and Proposed Action Alternatives through the year 2016. Releases between 8.23 and 11.5 million acre-feet generally correspond to years where equalization releases are being made from Lake Powell.

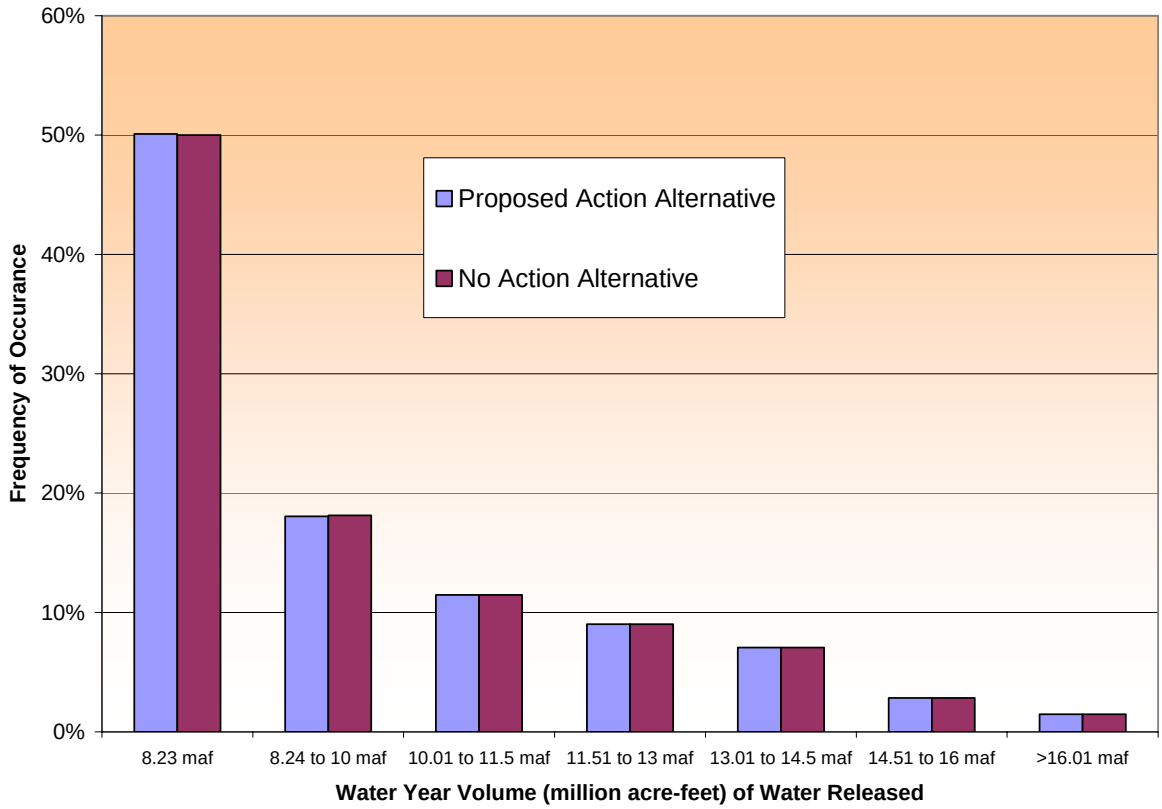

Figure 3.4.—Histogram of Lake Powell water year releases for the No Action and Proposed Action Alternatives for the period 2003-2016.

Figure 3.4 shows that over the course of a period through 2016, there is no change in the combined distribution of release volumes from Lake Powell. However, some differences could occur in specific years. In ten of the model traces, there is some change in storage equalization releases between the Proposed Action and No Action Alternatives. In these traces there is some change to release patterns from Lake Powell. However, analysis of model results shows that these changes would be very small. The probability that a monthly release volume could be modified by more than 1,000 cubic feet per second (cfs) is 0.08 percent (less than 1 in 1000). The probability that a monthly release volume could be modified by more than 2,000 cfs is 0.02 percent (about 1 in 5000). Under normal operations, as required in the Record of Decision on the Operation of Glen Canyon Dam, releases from Lake Powell range from 5,000 cfs to 25,000 cfs. The Proposed Action Alternative would not cause flows to go outside of this normal operating range.

Figures 3.5 and 3.6 illustrate possible changes in releases from Lake Powell that are attributed to the Proposed Action Alternative. Model results from Trace 56 are used as an analogue to depict such possible changes. Figure 3.5 depicts mean monthly releases from Lake Powell in Trace 56 under the No Action and Proposed Action Alternatives. Modifications to equalization releases can be seen in both 2006 and 2007, with slightly more water (330,000 acre-feet) being held in Lake Powell in 2006 under the Proposed Action Alternative than under the No Action Alternative.

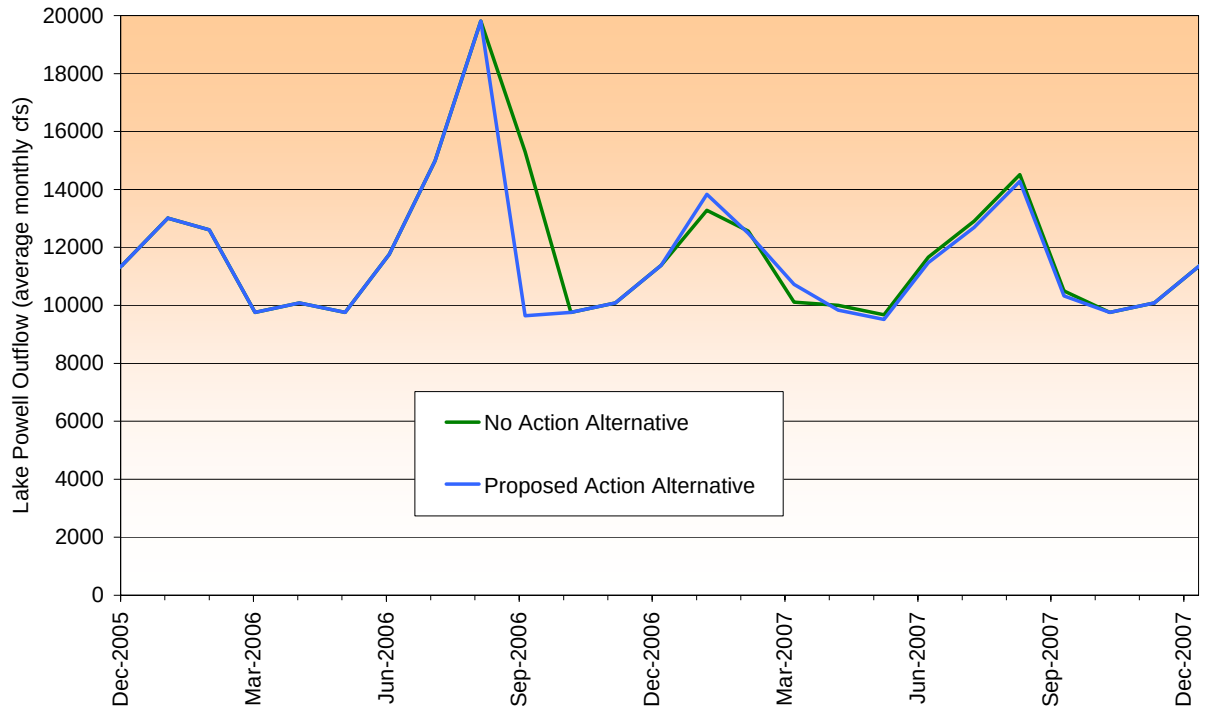

Figure 3.5.—Mean monthly releases from Lake Powell in Trace 56 for the No Action and Proposed Action Alternatives.

As has been previously noted, the Proposed Action Alternative has no effect on reservoir storage in Lakes Powell and Mead beyond the year 2016. In all model traces, equalization releases balance out by the year 2016, resulting in no long-term change to reservoir storage. Figure 3.6 illustrates Trace 56 in the years 2012 to 2014 where equalization releases from Lake Powell are higher under the Proposed Action Alternative than under the No Action Alternative.

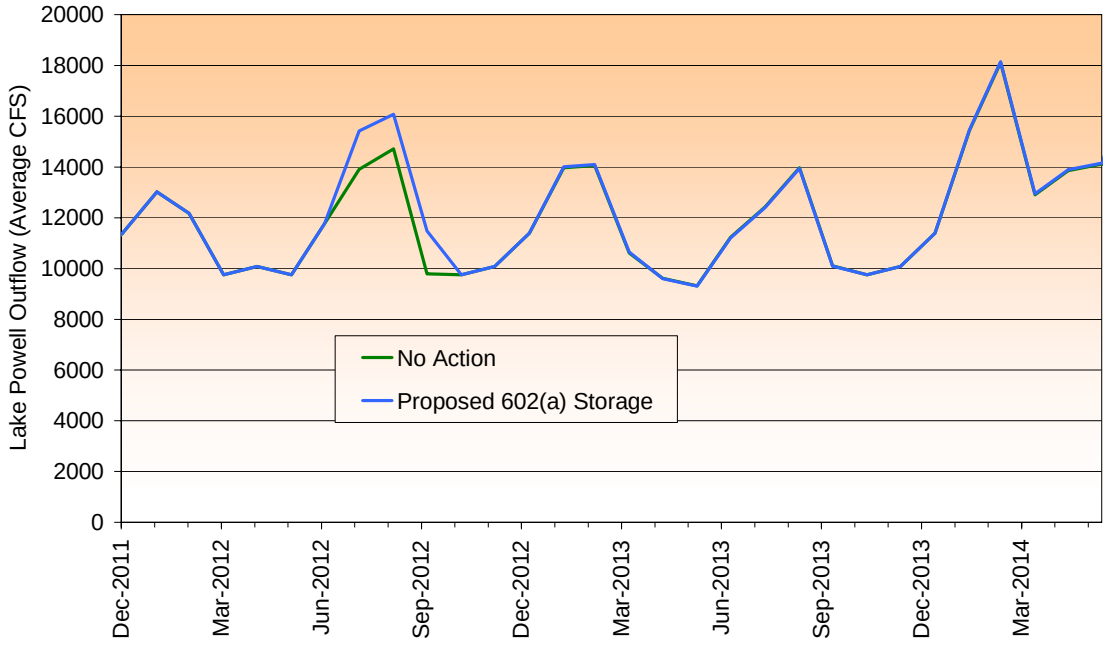

Figure 3.6.—Average monthly releases from Lake Powell in 2012 to 2014 in Trace 56 for the No Action and Proposed Action Alternatives.

Table 3.2 shows water year releases from Lake Powell for Trace 56 depicting how, under this trace, releases are reduced under the Proposed Action Alternative in 2006, but that this withheld water is later released to Lake Mead (in 2012 and 2014).

Water Year	No Action Alternative	Proposed Action Alternative	Percent Change
2004	8,230	8,230	0
2005	8,230	8,230	0
2006	8,950	8,620	-3.7 %
2007	8,230	8,230	0
2008	8,230	8,230	0
2009	8,230	8,230	0
2010	8,230	8,230	0
2011	8,230	8,230	0
2012	8,230	8,520	+3.5 %
2013	8,230	8,230	0
2014	12,410	12,440	+0.2 %
2015	8,230	8,230	0
2016	10,068	10,068	0

Table 3.2.—Water year releases (in thousand acre-feet) from Lake Powell in Trace 56

River simulation modeling shows that there is a 12 percent probability that the Proposed Action Alternative will alter flow patterns between Lakes Powell and Mead. However, changes to flows caused by the Proposed Action Alternative would be of small magnitude, with the resulting flow regimes remaining well within the range of normal operating parameters for Glen Canyon Dam.

LAKE MEAD WATER LEVELS

The Proposed Action Alternative could have some impact on water surface elevations at Lake Mead[17] due to changes in storage equalization releases. Figure 3.7 shows 90th, 50th, and 10th percentile values for Lake Mead end-of-December water surface elevations for the No Action and Proposed Action Alternatives. The 90th and 10th percentile lines bracket the range where 80 percent of the water levels are likely to occur. The lines for the No Action and Proposed Action Alternatives are indistinguishable for the 90th and 50th percentile. For the 10th percentile line there is only a very slight difference between the No Action and Proposed Action Alternatives.

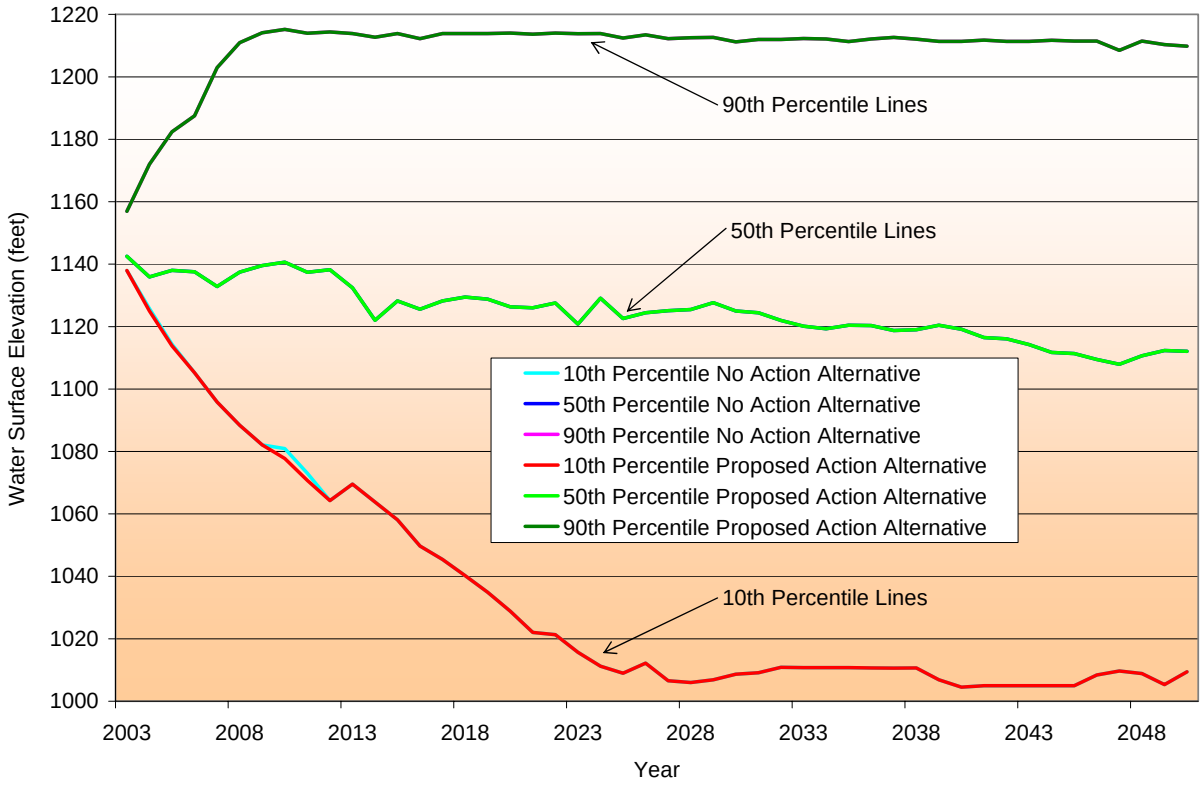

Figure 3.7.—Lake Mead end-of-December water surface elevations for the No Action and Proposed Action Alternatives.

[17] A complete description of Lake Mead and Hoover Dam can be found in Section 3.3.4.4 of the Colorado River Interim Surplus Criteria FEIS.

In the river simulation modeling, in ten out of 85 traces (the same traces where there were changes to Lake Powell) there was a difference in storage and water surface elevation in Lake Mead between the Proposed Action and No Action Alternatives. Table 3.3 depicts the greatest magnitude of change for these ten traces for water surface elevation. In five of the traces where there is an effect, the change is less than 1 foot.

Trace (First Historic Year for Trace)	Maximum Change (decrease) in Lake Mead Water Surface Elevation
12 (1918)	-0.3 feet
30 (1936)	-1.3 feet
37 (1943)	-0.2 feet
49 (1955)	-2.3 feet
56 (1962)	-3.6 feet
62 (1968)	-0.1 feet
68 (1974)	-4.1 feet
69 (1975)	-0.5 feet
71 (1977)	-0.7 feet
81 (1987)	-0.01 feet

Table 3.3.—Summary of model traces where changes to water surface elevations at Lake Mead occur

Figure 3.8 depicts Lake Mead water surface elevations for Trace 56 (which has 1962 hydrology in the first year) for the No Action and Proposed Action Alternatives. In this trace, hydrologic conditions would result in modified storage equalization releases, with Lake Mead being about 3.5 feet lower in elevation for 6 years under the Proposed Action Alternative.

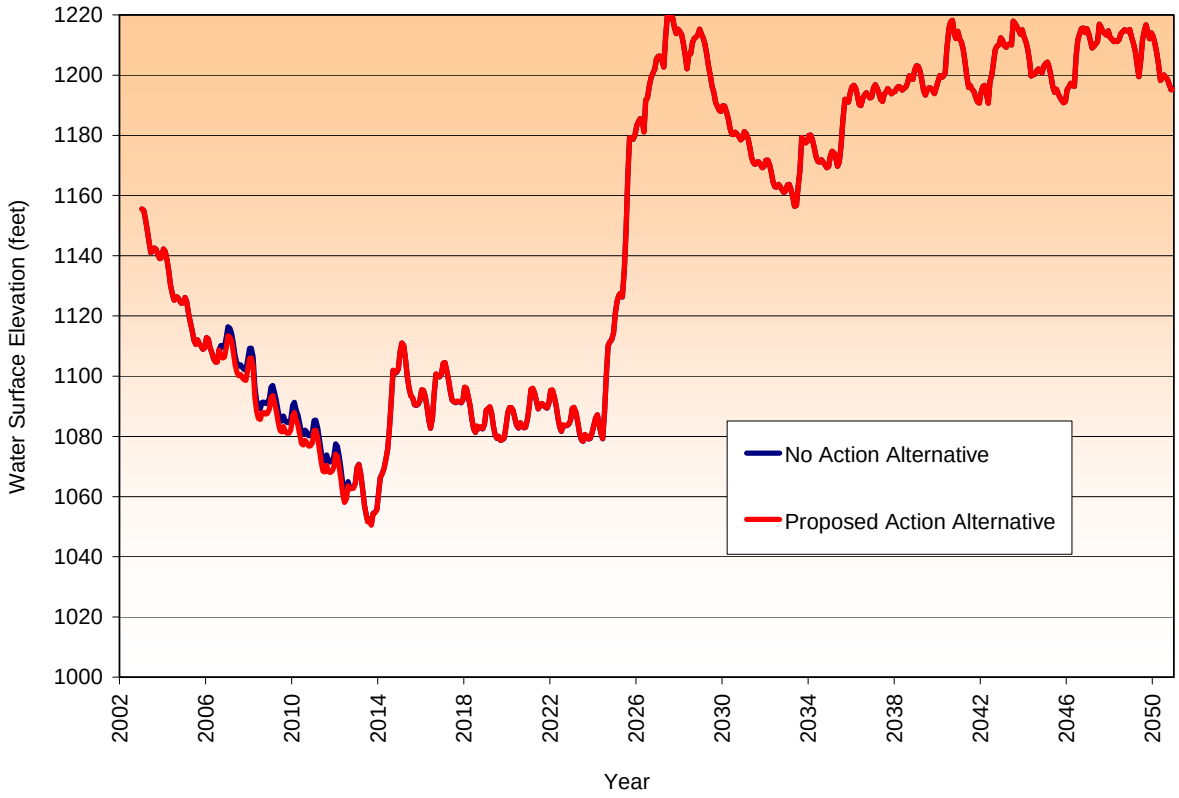

Figure 3.8.—Lake Mead water surface elevations for Trace 56 for the No Action and Proposed Action Alternatives.

Given that 75 out of the 85 model output traces show no difference in Lake Mead water surface elevations between the No Action and Proposed Action Alternatives, it is not likely that the Proposed Action Alternative will have an effect upon Lake Mead. However, it is possible that under some hydrologic scenarios there could be some effect, with the elevation of Lake Mead slightly lower under the Proposed Action Alternative than under the No Action Alternative.

RIVER FLOWS BETWEEN HOOVER DAM AND IMPERIAL DAM

The river flows between Hoover Dam and Imperial Dam are dominated by flow releases from Hoover Dam. Inflows from the Bill Williams River and other intermittent tributaries are infrequent and are usually concentrated into short time periods due to their dependence on localized precipitation. Tributary inflows comprise less than 1 percent of the total annual flow in this reach of the river. Both Lake Mohave and Lake Havasu are operated at constrained water

surface elevations such that the operation of these two reservoirs has limited impact on the flows in the Lower Colorado River Basin.

Modeling of the Proposed Action Alternative shows that in only one of the 85 possible model traces is there a difference between the Proposed Action and No Action Alternatives in flows below Hoover Dam. This occurs in Trace 68. In the third year of simulation (2005) in this trace, Lake Mead begins the year below elevation 1,125 feet under the Proposed Action Alternative and above this threshold under the No Action Alternative. Under the Colorado River Interim Surplus Guidelines, elevation 1,125 at Lake Mead is the trigger line between a "partial domestic surplus" and a "normal" delivery year of 7.5 million acre-feet for the Lower Basin. Because of this, less water is delivered from Lake Mead in this one year (2005) in Trace 68 under the Proposed Action Alternative than under the No Action Alternative. Based on projected surplus water use in the Lower Division States reflecting the October 10, 2003 Colorado River Water Delivery Agreement, surplus deliveries, under a partial domestic surplus in 2005, could be up to 245,000 acre-feet.[18] There is only about a 1 percent probability that this scenario would occur,

The flow below Parker Dam would not be lower under the Proposed Action Alternative as compared with the No Action Alternative. The only difference seen in flows below Parker Dam occurs later in Trace 68, in 2015, where there is an increase in releases of 100,000 acre-feet from Lake Mead as part of flood control releases. The difference in flow below Parker Dam in Trace 68 in 2015 occurred only in one month, June 2015, with 13,900 cfs under the No Action Alternative, and 15,570 cfs under the Proposed Action Alternative. The increased flow would remain within channel capacity.

Modeling of the Proposed Action Alternative shows there is only a 1 percent probability that flows between Hoover and Imperial Dams would change under the Proposed Action Alternative. The amount of change that could occur within this 1 percent would be an increase in flow of 1,670 cfs for one month.

RIVER FLOWS BETWEEN IMPERIAL DAM AND MORELOS DAM

The flows in the Colorado River below Imperial Dam are primarily comprised of the water delivered to Mexico in accordance with the treaty. Mexico's principal diversion is at Morelos Dam which is located approximately 9 miles southwest of Yuma, Arizona. Mexico owns, operates, and maintains Morelos Dam. For additional descriptive information on flows in this reach and deliveries of water from the United States to Mexico, reference Section 3.3.4.5.4 of the Colorado River Interim Surplus Criteria FEIS. The Proposed Action Alternative would not affect the delivery of water to Mexico under the treaty. Deliveries to Mexico are the same in all years for all traces between the Proposed Action and No Action Alternatives.

[18] There is considerable uncertainty associated with the exact volume of water might ultimately be ordered and delivered to the Lower Division States under a partial domestic surplus. In 2004, for instance, a determination of partial domestic surplus has been made, but as of March 2004, Metropolitan Water District of Southern California, which normally utilizes such surplus, has not utilized or requested surplus deliveries in 2004.

The modeling shows one year where there would be a small addition to flood flows (flows below Morales Dam in excess of Mexico's apportionment of water) in Mexico. This addition occurs in Trace 68. In 2005 of this trace, there is a partial domestic surplus under the Proposed Action Alternative and no surplus under the No Action Alternative. The deferral of this partial domestic surplus results in additional water being stored in Lake Mead. In the year 2015, 100,000 acre-feet of this additional water becomes part of a flood control release from Lake Mead in June. This extra water is small in comparison to the volume of the flood control release. The volume of the excess flow in 2015 in Trace 68 is 2,900,000 acre-feet, with the additional water being only 3.4 percent of this total.

RIVER FLOW ISSUES

This section considers the potential effects of the Proposed Action Alternative on three types of releases from Glen Canyon Dam and Hoover Dam. These three releases are beach/habitat-building flows from Glen Canyon Dam, seasonally adjusted steady flows from Glen Canyon Dam, and flood control releases from Hoover Dam.

Beach/Habitat-Building Flows From Glen Canyon Dam

The Proposed Action Alternative was found to have no effect on the frequency at which beach/habitat-building flows are conducted. The frequency of beach/habitat-building flows was 8 percent through the year 2016 under the Proposed Action and No Action Alternatives. Beach/habitat-building flows are described in detail in Section 3.6.2 of the Colorado River Interim Surplus Criteria FEIS.

Seasonally Adjusted Steady Flows From Glen Canyon Dam

During preparation of the Operation of Glen Canyon Dam FEIS, it was hypothesized that steady flows with a seasonal pattern may have a beneficial effect on the potential recovery of special status fish species downstream of Glen Canyon Dam. Accordingly, development of an experimental water release strategy was recommended by the U.S. Fish and Wildlife Service to achieve steady flows when compatible with water supply conditions and the requirements of other resources. The strategy included developing and verifying a yet to be defined program of experimental flows that would include providing high steady flows in the spring and low steady flows in the summer and fall during water years when a volume of approximately 8.23 million acre-feet is released from Glen Canyon Dam. This strategy was contained in the Final Biological Opinion on the Operation of Glen Canyon Dam and recognized in the Record of Decision on the Operation of Glen Canyon Dam.

The effect that the Proposed Action Alternative could have on the frequency of 8.23 million acre-foot release years was studied. Simulation modeling showed that the Proposed Action Alternative would have no effect on the frequency of 8.23 million acre-foot release years from the period 2004 through 2016. The frequency of 8.23 million acre-foot release years was 50 percent under both the Proposed Action and No Action Alternatives.

On April 24, 2002, members of the Glen Canyon Adaptive Management Work Group recommended to the Secretary of the Interior that an experimental flow test be made from Glen Canyon Dam beginning in water year 2003. The recommendation addressed the decline of two key resources in the Grand Canyon: sediment and population viability of endangered humpback chub. Reclamation, the National Park Service, and the United States Geological Survey jointly prepared an EA under the National Environmental Policy Act to document the impacts of these proposed experimental flows. The Proposed Experimental Releases from Glen Canyon Dam and Removal of Non-Native Fish EA was released in September 2002. A Finding of No Significant Impact on the experimental releases was signed by the three agencies on December 6, 2002. The Proposed Action Alternative in this EA would have no effect upon the experimental releases from Glen Canyon Dam. The experimental releases would be able to continue unaltered even if there were some changes in storage equalization releases.

Flood Control Releases From Hoover Dam

The Proposed Action Alternative was found to have negligible effects on flood control releases downstream of Hoover Dam. The frequency at which flood control releases from Hoover Dam were made was the same under the Proposed Action and No Action Alternatives, occurring at a frequency of 12.4 percent. The frequency at which flood control releases exceeded 26,000 cfs from Davis Dam was 3.4 percent under both alternatives. The frequency at which flood control releases exceeded 19,500 cfs from Parker Dam was 4.6 percent under both alternatives. Information on flood control criterion at Hoover Dam and downstream resources affected by flooding below Hoover Dam can be found in Sections 3.3.1.2 and 3.6.4, respectively, of the Colorado River Interim Surplus Criteria FEIS. The only difference in flood control releases occurs in Trace 68, where in the year 2015, there is an increase of 100,000 acre-feet in the month of June. There is only a 1 percent probability that this increase could occur, and the 100,000 acre-feet is small in relationship to the volume of flood control releases (an increase of only 3.4 percent).

WATER SUPPLY

Section 3.4 of the Colorado River Interim Surplus Criteria FEIS contains extensive descriptive information on the use of Colorado River water by Arizona, California, Colorado, New Mexico, Nevada, Utah, Wyoming, and Mexico.

Water supply to the Lower Division States of Arizona, California, and Nevada would not likely be affected by the Proposed Action Alternative. The Proposed Action Alternative would not result in additional surplus deliveries to the Lower Division States of Arizona, California, or Nevada. Simulation modeling shows that in only one year of one trace would there be any effect to water supply in the Lower Basin. This occurs in 2005 of Trace 68 where changes in storage equalization releases from Lake Powell under the Proposed Action Alternative result in Lake Mead beginning the water year below elevation 1,125 feet. Under the No Action Alternative, Lake Mead would be above this threshold. This occurrence would reduce surplus availability under the Proposed Action Alternative. Based on projected surplus water use in the Lower Division States reflecting the October 10, 2003 Colorado River Water Delivery Agreement,

surplus deliveries, under a partial domestic surplus in 2005, could be up to 245,000 acre-feet. Delivery of water to Nevada would be reduced by about 11,000 acre-feet, while the reductions in deliveries to California could be as high as 234,000 acre-feet under this scenario. Arizona's predicted would not likely change. It should be emphasized there was only one year in one trace where the Proposed Action Alternative modified the surplus trigger elevation at Lake Mead. There is only about a 1 percent probability of this scenario occurring, and this would only occur in one year of the time frame through 2016.

In future years as the Upper Basin continues to develop Colorado River Water, the CRSS model predicts that there will be periodic water shortages to the Lower Division States of Arizona, California, and Nevada. While no specific criteria for shortage has been adopted, CRSS utilizes modeling assumptions to deliver main stream Colorado River water for use by the Lower Division States that is less than 7.5 million acre-feet in years when reservoir storage in Lake Mead is low (in general, near or below an elevation of 1,100 feet). See Section 2.4 of Appendix G of the Implementation Agreement, Inadvertent Overrun and Payback Policy, and Related Federal Actions FEIS for a description of how CRSS models shortage. Using CRSS model assumptions for shortage, the proposed Action Alternative was found to have no effect on shortages to the Lower Division States. There was no difference in shortage to the Lower Division States between the Proposed Action and No Action Alternatives.[19] Modeling also showed that the proposed action would not result in changes to water levels at Lake Mead below elevation 1,050, and that there would be no impact to the ability of Southern Nevada Water Authority to utilize their intakes.

The Proposed Action Alternative was found to have no effect on the water supply to the Upper Division States of Colorado, New Mexico, Utah and Wyoming. The Proposed Action Alternative was found to have no effect on the water supply to Mexico.

WATER QUALITY

Section 3.5 of the Colorado River Interim Surplus Criteria FEIS contains an extensive description of the water quality of the Colorado River and mainstream reservoirs.

The Proposed Action Alternative would not cause a reduction in storage at Lake Powell. There would be no degradation to water quality, as measured by total dissolved solids, in Lake Powell or the Colorado River between Lakes Powell and Mead caused by the proposed Federal action.

There is the potential for some minor increases in salinity at Lake Mead. Two areas of concern are salinity as measured by total dissolved solids and water quality at the Southern Nevada Water Authority intakes in the Boulder Basin of Lake Mead.

There is a 12 percent probability that the Proposed Action Alternative could result in a minor reduction to storage at Lake Mead. Simulation modeling shows the greatest reduction in storage

[19] Shortage conditions would be brought about by an extended period of drought in the Colorado River Basin. In periods of drought, Lake Powell releases are the minimum objective release with no equalization releases occurring. Because of this, there is no difference in projected shortages under the Proposed Action and No Action Alternatives.

caused by the Proposed Action Alternative at Lake Mead is a reduction of 413,000 acre-feet (in Trace 68) with a corresponding reduction in storage of 2.9 percent. With potential storage reductions at Lake Mead at this low level, even under the "worst-case" scenario, water quality changes at Lake Mead due to the Proposed Action Alternative would likely be inconsequential.

The Southern Nevada Water Authority has recently completed upgrading its raw water treatment facilities. These facilities will be able to meet any treatment challenges from incremental reductions in storage at Lake Mead attributable to the Proposed Action Alternative.

The Proposed Action Alternative has only a 1 percent probability of impacting flows below Hoover Dam. Due to the small impacts of the Proposed Action Alternative on water storage in Lake Mead, salinity impacts would be negligible in the reaches below Lake Mead.

Numeric criteria for water quality on the Colorado River have been created at three locations in the Lower Basin: below Hoover Dam, below Parker Dam, and below Imperial Dam. A Mexican Water Treaty obligation with Mexico at the Northern International Boundary involves the differential between water arriving there and water arriving at Imperial Dam. The Colorado River Basin Salinity Control Forum reviewed the Water Quality Standards for Salinity in 2002, including numeric criteria and the plan of implementation for salinity control (Plan). The Plan as described in the review enables the numeric criteria to be met through 2016.

AQUATIC RESOURCES

Section 3.7 of the Colorado River Interim Surplus Criteria FEIS contains descriptive information on aquatic resources at Lake Powell and Lake Mead and the Colorado River between Lakes Powell and Mead.

The Proposed Action Alternative was determined to have no effect on aquatic resources between Lakes Powell and Mead and on aquatic resources below Lake Mead. The water surface elevation of Lakes Mojave and Havasu (below Lake Mead) would not be changed under the Proposed Action Alternative. Any changes to flows between Lakes Powell and Mead and to flows below Lake Mead would be at levels so low that there would be no detectible effects to aquatic resources in those regions.

Under the Proposed Action Alternative there is a 12 percent probability that minor increases in the water surface elevation of Lake Powell (1 to 6 feet), with corresponding minor decreases in the water surface elevation of Lake Mead (1 to 4 feet), could occur. Lakes Powell and Mead consist primarily of deep, clear open-water habitats with a cold hypolimnion that is consistently maintained due to thermal and chemical properties. Habitat changes that result from fluctuating lake levels have favored introduced species tolerant of conditions and temperatures found in the lakes. These species are able to reproduce in the lakes and are not expected to be affected by fluctuating lake levels.

Lake Powell and Lake Mead will continue to be subjected to varying inflows and fluctuating lake elevations, primarily due to Colorado River Basin hydrologic conditions. The predicted

range of fluctuation at Lake Powell is expected to be 117 feet through the year 2016 under both the No Action and Proposed Action Alternatives. At Lake Mead the predicted range of fluctuation in this period is 84 feet, with this range being identical in both the No Action and Proposed Action Alternatives. It is within this large range of fluctuation, that occur under normal operations, that there could be some difference between the Proposed Action and No Action Alternatives. The incremental change in water surface elevations that could be caused by the Proposed Action Alternative is within the normal operational range of fluctuations. The Proposed Action Alternative would not result in measurable changes to lake habitat.

SPECIAL STATUS SPECIES

Special status species considered in this environmental assessment are coincident with those considered in the Colorado River Interim Surplus Criteria FEIS (Section 3.8) and the Proposed Experimental Releases from Glen Canyon Dam and Removal of Non-Native Fish Environmental Assessment (pages 36-43).

Potential effects of the Proposed Action Alternative on flows and on the river reach between Lakes Powell and Mead were determined to be so minor that there would be no effects to special status species. River simulation modeling showed that there is a 12 percent probability that there could be some change to equalization releases caused by the Proposed Action Alternative through the year 2016. Changes in flow, if they occur, would be of small magnitude, with resulting flow regimes remaining well within the range of the operating parameters established in the Record of Decision on the Operation of Glen Canyon Dam. Under the Proposed Action Alternative, physical changes to the river environment would be minimal and there would be no measurable changes to critical habitats of special status species, including endangered humpback chub, in the river reach between Lakes Powell and Mead.

Changes to flows and the river environment from Lake Mead to Mexico, potentially caused by the Proposed Action Alternative, were also determined to be so minor that there would be no effects to special status species. River simulation modeling showed that there is a 1 percent probability that there could be some change to flows below Lake Mead caused by the Proposed Action Alternative. Changes to flows below Lake Mead, if they did occur at all, would be of a small magnitude as described previously in this document (River Flows Between Hoover Dam and Imperial Dam). Physical changes to the river environment would be minimal and there would be no effects to special status species or their critical habitat.

No potential effects to special status species caused by changes in the water surface elevation in Lake Mead have been identified. There is a 12 percent probability that the Proposed Action Alternative could result in minor changes in storage and water surface elevations at Lake Mead through the year 2016. The water surface elevation at Lake Mead is continually changing under both the No Action and Proposed Action Alternatives. Potential changes to the water surface elevation at Lake Mead, if they were to occur due to the Proposed Action Alternative, would be relatively small. The greatest change in modeling between the Proposed Action and No Action Alternatives occurred in Trace 68 where there was a decrease in the Lake Mead water surface elevation of 4.1 feet. There is only a 1 percent probability that this change would occur. Under

the Proposed Action Alternative, there would not be effects to the endangered razorback sucker in Lake Mead or to southwestern willow flycatcher which inhabit areas surrounding the lake.

It was determined that the Proposed Action Alternative would have no effect on special status species in the affected environment (Lake Powell to the Southerly International Boundary).

RECREATION

The Colorado River, Lake Powell, and Lake Mead provide water based recreation opportunities that are of local, regional, and national significance, as well as international interest. Colorado River and mainstream reservoir recreation is described in detail in Section 3.9 of the Colorado River Interim Surplus Criteria FEIS.

Colorado River Recreation

The Proposed Action Alternative would likely have no effects, or very minimal effects, upon river flows below Glen Canyon Dam, or on river flows from Hoover Dam to the Southerly International Boundary. There would be no measurable impacts to recreation caused by the Proposed Action Alternative on river recreation, which includes whitewater boating and sport fishing.

Recreation at Lake Powell

Under the Proposed Action Alternative, there is a 12 percent probability of small periodic increases in water surface elevation from 2004 through 2016. Under the Proposed Action Alternative, the water surface elevation of Lake Powell would be no lower than it would be under the No Action Alternative. Recreation resources at Lake Powell include reservoir marinas, boat launching, shoreline access, boating and navigation, sport fishing, and recreation facility operational costs. Under the Proposed Action Alternative, there would be no negative effect on recreation at Lake Powell.

Recreation at Lake Mead

Under the Proposed Action Alternative, there is a 12 percent probability of small periodic decreases in the water surface elevation from 2004 through 2016. Opposite to Lake Powell, the elevation of Lake Mead could be lower under the Proposed Action Alternative than under the No Action Alternative. Recreation resources at Lake Mead include reservoir marinas, boat launching, shoreline access, boating and navigation, sport fishing, and recreation facility operational costs.

Because water storage at Lake Mead could be slightly lower for a period of a few years under the Proposed Action Alternative, there could be some impacts to recreation at Lake Mead. The largest possible change at Lake Mead occurs in Trace 68 in November 2004 when the elevation of Lake Mead would be reduced from 1,127.8 feet under the No Action Alternative to 1,123.7 feet under the Proposed Action Alternative (a reduction of 4.1 feet). This reduction would cause

a 1.8 percent decrease in the surface area of Lake Mead, incrementally reducing the available area for recreation activities on the lake.

The Proposed Action Alternative could result in some incremental impacts to marinas on Lake Mead. Because the water surface elevation at Lake Mead is continually changing, boat launching facilities at marinas must also be moved and adjusted to accommodate changes in lake elevations. Historically, on average, the fluctuation in the water surface elevation at Lake Mead is about 13 feet per year. As noted in the section of this document on Aquatic Resources, there would be no change to the overall range of fluctuations at Lake Mead caused by the Proposed Action Alternative.

The National Park Service estimates the cost of moving boat docks and ancillary facilities at Lake Mead marinas to be 5 to 6 million dollars for a 20-foot reduction in the water surface elevation. Using this rate, the average increase in operating costs to marinas on Lake Mead caused by the Proposed Action Alternative would be $28,000 to $33,000 per year. There is a 12 percent probability that Lake Mead elevations could change and operating costs at marinas could increase. In the worst case model trace, the maximum increase in operating costs over the period 2004 to 2016 would be about one million dollars. There is a 1 percent probability of this occurring.

A comprehensive description of recreation resources associated with Lake Mead and Lake Powell is contained in Section 3.9 of the Colorado River Interim Surplus Criteria FEIS.

Recreation at Lake Mohave and Lake Havasu

The operation of Lakes Mohave and Havasu is pursuant to monthly operating target elevations that are used to manage the storage and release of water and power production at these facilities. There would be no effect to recreation at Lake Mohave and Lake Havasu.

HYDROPOWER

Descriptions of hydropower and energy resources in the affected area are contained in Section 3.10 of the Colorado River Interim Surplus Criteria FEIS.

The Proposed Action Alternative has potential impacts on energy production at Glen Canyon and Hoover Dams and on pumping costs for various water intakes on Lakes Powell and Mead. Under the Proposed Action Alternative, the negative impacts on hydropower generation would be temporarily withheld water releases from Glen Canyon Dam and temporarily decreased water surface elevations at Lake Mead. The water that would be temporarily held at Glen Canyon Dam would be released later, causing the elevation of Lake Powell to be slightly higher, which would in turn produce more energy. The impact on the average annual power production at Glen Canyon Dam from 2004 to 2016 would be an increase of 243 megawatt-hours, or 0.005 percent of the annual average of 4,095 gigawatt-hours. The impact on the average annual power production at Hoover Dam from 2004 to 2016 would be a decrease of 265 megawatt-hours, or 0.006 percent of the annual average of 4,197 gigawatt-hours.

The pumping costs for the City of Page, Arizona, and the Navajo Generating Station have the potential to decrease slightly due to water being held longer in Lake Powell. The pumping costs for the Southern Nevada Water System intakes at Lake Mead have the potential to increase incrementally. According to a letter from the Southern Nevada Water Authority, referenced in the Colorado River Interim Surplus Criteria FEIS, a rate of $28,000 per foot per year of increased pumping costs may be applied to their intakes. Using this rate, the average increase in pumping costs caused by the Proposed Action Alternative would be $1,246 per year. There is a 12 percent probability that Lake Mead elevations could change and pumping costs could increase. In the worst case model trace, the increase in annual pumping costs would be about $100,000 from 2004 to 2016. There is a 1 percent probability of this occurring.

AIR QUALITY

Descriptive information on air quality in the affected area is contained in Section 3.11 of the Colorado River Interim Surplus Criteria FEIS.

The Proposed Action Alternative would not involve new construction or physical activities that would result in air emissions within the area of potential effect considered in this final environmental assessment. Air quality effects are limited to changes in fugitive dust emissions that could result from changes in exposed reservoir shoreline as a result of potential changes in Lake Mead and Lake Powell water surface elevations. Fugitive dust emissions, such as those from exposed reservoir shorelines, can contribute to PM_{10} concentrations. To the extent that exposed shoreline is characterized by relatively fine or light soils, fugitive dust emissions can result. However, given the apparent nature of the reservoir shorelines (more gravel surface than soil) and the relatively low average winds in the reservoir areas, soil materials from exposed shoreline areas do not appear to result in significant fugitive dust emissions.

The water surface of Lake Powell would be no lower under the Proposed Action Alternative than under the No Action Alternative, and there would be no increase in fugitive dust caused by the Proposed Action Alternative.

At Lake Mead, there is an 88 percent probability that the Proposed Action Alternative would cause no change to exposed reservoir shoreline. Under the worst case model trace (1 percent probability of occurring) there would be an increase of exposed shoreline at Lake Mead of 1,779 acres, an increase of 3.1 percent when compared to the No Action Alternative. The additional exposed shoreline, if it were to occur, would not be expected to cause an air quality concern in the surrounding area.

VISUAL RESOURCES

Descriptive information on visual resources in the affected area is contained in Section 3.12 of the Colorado River Interim Surplus Criteria FEIS.

Lake Powell and Lake Mead fluctuate on annual cycles and multi-year cycles through periods of wet and dry hydrology. Figures 3.3 and 3.8 illustrate these fluctuations. Water surface fluctuations are observed under both the No Action and Proposed Action Alternatives. There is a 12 percent probability that the Proposed Action Alternative would result in changes to water surface elevations at both Lakes Powell and Mead. If changes occur, they would be small in relationship to the range of fluctuations seen under varying multi-year hydrologic cycles. Visual consequences under the Proposed Action Alternative would involve the same scenic changes that currently take place under the No Action Alternative.

CULTURAL RESOURCES

Descriptive information on cultural resources in the affected area is contained in Section 3.13 of the Colorado River Interim Surplus Criteria FEIS.

Cultural resources include historic buildings and structures, archaeological sites, traditional cultural properties, sacred sites, and linear features such as roads and trails, etc. Historic properties are the subset of cultural resources that are eligible for listing on the National Register of Historic Places. Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their actions on historic properties and to allow the Advisory Council on Historic Preservation an opportunity to comment. Executive Order 13007 requires consultation with Indian tribes about sacred sites. The Bureau of Reclamation has initiated consultation with concerned Indian tribes, State Historic Preservation Officers, Tribal Historic Preservation Officers, and other interested parties regarding the interim 602(a) storage guideline; however, the process of cultural resource compliance and consultation is not yet complete.

For the interim 602(a) storage guideline, as well as several recent Bureau of Reclamation undertakings including the Colorado River Interim Surplus Guidelines, the Bureau of Reclamation (with the assistance of the National Park Service and Indian tribes) has begun the process of identifying and evaluating historic properties within the area of potential effects of on-going Colorado River system operations. To evaluate the National Register eligibility of documented cultural resources within the operational zones of the reservoirs, the Bureau of Reclamation will be extrapolating from inundation studies conducted by the National Park Service and U.S. Army Corps of Engineers (Dunn, 1996; Lenihan, et al. 1981; Ware, 1989). These studies concluded that cultural resources located within the deep-water zone of reservoirs are least susceptible to impacts of inundation and reservoir operations, while cultural resources within the operational zones of reservoirs are subject to adverse impacts from wave action and the alternating effects of wetting and drying related to fluctuating pool levels. Cultural resources immediately above full pools have generally been disturbed and damaged by recreation and visitation. Based on these studies, most historic properties within reservoir and river system areas of potential effect have lost their integrity and eligibility for the National Register of Historic Places.

In addition to these general studies of the effects of inundation on cultural resources, historic properties within the operational zones of Lakes Powell (Rayl, et al. 1981), Mead, and Mohave

(Miller, 2002) have been relocated and evaluated for their current National Register eligibility. The conclusions of these diving studies and shoreline evaluations are that while certain property types (such as rock art) might still be present, the majority of cultural resources within Lakes Powell, Mead, and Mohave are no longer historic properties eligible for the National Register of Historic Places.

The Bureau of Reclamation is still in the process of compiling data regarding the location and character of cultural resources (and historic properties) within the area of potential effects of the Proposed Action Alternative and the Colorado River Interim Surplus Guidelines. It will take some time to thoroughly evaluate eligibility and effect in consultation with all interested parties, including State and Tribal Historic Preservation Officers, the Advisory Council on Historic Preservation, Indian tribes, the National Park Service, and the public interested in historic preservation. However, given that the predicted changes in reservoir elevations and river flows that might result from implementation of the Proposed Action Alternative are well within the normal parameters for river and reservoir operations, and in the absence of any negative effects that might occur to resources of cultural importance to tribes or other communities were the guidelines to be implemented, the Bureau of Reclamation believes there will be no effect on cultural resources as a result of this undertaking.

INDIAN TRUST ASSETS

Descriptive information on Indian Trust Assets in the affected area is contained in Section 3.14 of the Colorado River Interim Surplus Criteria FEIS.

Indian Trust Assets are legal assets associated with rights or property held in trust by the United States for the benefit of Federally-recognized Indian tribes or individuals. The United States, as trustee, is responsible for protecting and maintaining rights reserved by, or granted to, Indian tribes or individuals by treaties, statutes, and executive orders. All Federal bureaus and agencies share a duty to act responsibly to protect and maintain Indian Trust Assets. The Bureau of Reclamation's policy, which satisfies the requirement of the Department of the Interior's Departmental Manual at 512 DM 2, is to protect Indian Trust Assets from adverse impacts resulting from its programs and activities whenever possible. The Bureau of Reclamation, in cooperation with tribe(s) potentially impacted by a given project, must inventory and evaluate assets, and then mitigate or compensate for adverse impacts to the assets.

The effect of the Proposed Action Alternative on tribal water rights and water use was evaluated for the following tribes:

Northern Ute Tribe	Utah
Jicarilla Apache Tribe	New Mexico
Navajo Nation	Arizona, New Mexico, and Utah
Southern Ute Indian Tribe	Colorado
Ute Mountain Ute Tribe	Colorado and New Mexico
Fort Mojave Indian Tribe	Arizona, California, and Nevada
Chemehuevi Tribe	California
Colorado River Indian Tribes	Arizona and California
Quechan Indian Tribe	Arizona and California
Cocopah Indian Tribe	Arizona

The Proposed Action Alternative could shift minor amounts of stored water from Lake Mead to Lake Powell during the period through 2016, as has been noted in previous sections of this document. The Proposed Action Alternative would not alter the quantity or priority of tribal entitlements. The Colorado River tribes have the highest priority water rights on the Colorado River. The Proposed Action Alternative does not make any additional water available for delivery and use to any entity as compared with current conditions.

The Colorado River tribes listed above have a significant amount of undeveloped water rights. The Bureau of Reclamation does not believe that the Proposed Action Alternative would have any effect on tribal water or result in any disincentives for tribal water development.

ENVIRONMENTAL JUSTICE

The Proposed Action does not involve facility construction, population relocation, hazardous waste, property takings, or substantial economic impacts. Neither of the two alternatives analyzed in this document would have an adverse environmental effect on minority and low income populations as defined by environmental justice policies and directives. The only adverse effects on human health are indirect, i.e., insect stings and insect-vectored disease which are known to occur in the Colorado River floodplain and will continue to occur no matter what alternative is selected. In short, there are no environmental justice implications from the Proposed Action Alternative.

CUMULATIVE IMPACTS

Cumulative impacts to the environment result from incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions. The proposed Federal action considered in this document is an interim action, in effect through the year 2016.

Cumulative impacts of the Proposed Action Alternative were analyzed in relationship to the Operation of Glen Canyon Dam FEIS. This FEIS and subsequent Record of Decision modified power operations at Glen Canyon Dam and established beach/habitat-building flows and beach/habitat maintenance flows as restorative measures for environmental resources in the Colorado River below Lake Powell. Annual volumes of water released from Glen Canyon Dam

were not modified by the Glen Canyon Dam FEIS and there would be no cumulative effects caused by the Proposed Action Alternative in this environmental assessment in combination with the actions taken in the Glen Canyon Dam FEIS.

There are numerous projects in the Lower Colorado River, whose effects coincide with the affected area in this environmental assessment and the Interim Surplus Guidelines. These projects include the Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement, the All-American Canal Lining, Coachella Canal Lining, Rule for Offstream Storage, Lower Colorado River Multi-Species Conservation Program, and the Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions FEIS. Descriptions of these projects (with the exception of Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement) can be found in the Executive Summary and Section 4.2 of the Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions FEIS. The cumulative impact analysis contained in the Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions FEIS, discussed the cumulative impacts of these projects listed above in combination with the actions of Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions.

The greatest effect of these actions is a change in the point of diversion of water. The Implementation Agreement and Colorado River Water Delivery Agreement results in less flow between Parker Dam and Imperial Dam as water transfers from California agriculture to California municipal use results in less water being delivered to Imperial Dam for subsequent delivery through the All-American Canal. The Coachella Canal Lining, All-American Canal Lining, and Rule for Offstream Storage also result in a change of diversion with potential decreases in flows below Parker Dam. With one exception, simulation modeling in this environmental assessment resulted in no change to flows in the Colorado River below Parker Dam under the proposed Action Alternative, compared to the No Action Alternative. For one hydrologic scenario (one trace), an increase in flows from 13,900 cfs under the No Action Alternative to 15,570 cfs under the Proposed Action Alternative was observed for one month (in June 2015). There is a one percent probability of this occurring. This occurred during a flood control release from Lake Mead and is discussed in the section of the EA on “River Flows between Hoover Dam and Imperial Dam.” Because the effects to flows below Parker Dam are negligible, there would be no cumulative impacts to this river segment.

There is a small probability (1 percent) that the Proposed Action Alternative could result in a decrease in flows from Lake Mead to Lake Havasu, with the mechanism being that the level of Lake Mead under the Proposed Action Alternative could be below the 1125 foot elevation threshold where there would be no Lower Basin surplus. The Offstream Storage Rule could result in some additional reductions in flow between Lake Mead and Lake Havasu. Development of an intentionally created unused apportionment (ICUA) by Nevada would cause Arizona to reduce its water order by the amount requested by Nevada, thereby reducing flows between Lake Mead and Lake Havasu.

The proposed Federal action in this environmental assessment is related to the Colorado River Interim Surplus Guidelines in that the Proposed Action Alternative is based on the same information (submitted by the Colorado River Basin States) upon which the preferred alternative for the Colorado River Interim Surplus Criteria FEIS was based. The Proposed Action Alternative could result in a minor cumulative impact to Lake Mead when considered with the Interim Surplus Guidelines. It was shown in the Interim Surplus Guidelines FEIS that under most probable conditions (50^{th} percentile) the preferred alternative (Basin States Alternative) was likely to result in a decrease of 19 feet in the water surface elevation at Lake Mead (Section 3.3.4.4.4 of the Interim Surplus Guidelines FEIS) in the year 2016. The Proposed Action Alternative in this environmental assessment, however, will not result in any change in the water surface elevation at Lake Mead under most probable conditions.

It is only under the 10^{th} percentile that the Proposed Action Alternative would result in a change to Lake Mead storage. Under the 10^{th} percentile, the Basin States Alternative in the Colorado River Interim Surplus Criteria FEIS showed a decrease in the water surface elevation at Lake Mead of 11 feet in the year 2016. Under the Proposed Action Alternative, a reduction of 3 feet in the year 2010 could be expected in the 10^{th} percentile probability curve (see Figure 3.7). This would be a minor potential cumulative impact which would have a 10 percent probability of occurring. Such a cumulative impact would be temporary in that simulation modeling of the Colorado River system demonstrates that by the year 2016 there would be no differences in the Colorado River system between the No Action and Proposed Action Alternatives.[20]

Cumulative impacts of the Proposed Action Alternative were also assessed in combination with the Experimental Releases from Glen Canyon Dam and Removal of Non-Native Fish. A Finding of No Significant Impact (FONSI) on this action was signed by the Bureau of Reclamation, the National Park Service, and the United States Geological Survey on December 6, 2002. The experimental releases do not alter annual releases volumes from Glen Canyon Dam and there would be no cumulative effects caused the by the Proposed Action Alternative in combination with the experimental flows.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments are decisions affecting renewable resources such as soils, wetlands, and waterfowl habitat. Such decisions are considered irreversible when their implementation would affect a resource that has deteriorated to a point where renewal could occur only over a long period of time, at great expense, or cause the resource to be destroyed or removed.

None of the resources assessed in this final environmental assessment would experience deterioration to the extent that the resource would be destroyed or removed as a result of implementing either the Proposed Action or No Action Alternatives. The Colorado River system may also refill at some time in the future, due to high inflows, resulting in full reservoirs. There would be no construction of facilities needed to facilitate the Proposed Action Alternative.

[20] Cumulative analysis contained in Appendix G of the Implementation Agreement, Inadvertent Overrun and Payback Policy and Related Federal Actions FEIS provides additional technical information on cumulative effects.

Irretrievable commitment of natural resources means the loss of production or use of resources as a result of a decision. It represents opportunities foregone for the period of time that a resource cannot be used. All of the resources assessed in this document would continue to be available for production under the Proposed Action or No Action Alternatives.

IMPAIRMENT TO NATIONAL PARK SERVICE RESOURCES

Based upon evaluation of the impacts discussed in Chapter 3 of this document, no significant impairment to the resources of Grand Canyon National Park, Glen Canyon National Recreation Area, or Lake Mead National Recreation Area would occur as a result of the Proposed Action Alternative.

4 Consultation and Coordination

PUBLIC INVOLVEMENT

The proposed Federal action in this final environmental assessment was discussed publicly at meetings of the Colorado River Management Work Group in 2001, 2002, and 2003. Each year, in developing the Colorado River Annual Operating Plan for the subsequent year, the Bureau of Reclamation consults with representatives of the Governors of the seven Colorado River Basin States, the Upper Colorado River Commission, Native American tribes, appropriate Federal agencies, representatives of academic and scientific communities, environmental organizations, the recreation industry, water delivery contractors, contractors for the purchase of Federal power, others interested in Colorado River operations, and the general public through the Colorado River Management Work Group.

The proposed Federal action was also discussed publicly at meetings of the Glen Canyon Dam Adaptive Management Work Group in 2002 and 2003. The Glen Canyon Dam Adaptive Management Work Group is a Federal Advisory Committee which facilitates public involvement in decision making related to the operation of Glen Canyon Dam.

In January 2003, a formal presentation on 602(a) storage requirements was made to the Glen Canyon Dam Adaptive Management Work Group in Phoenix, Arizona. The presentation gave background information on 602(a) storage requirements, described the proposed Federal action analyzed in this final environmental assessment, and discussed the Bureau of Reclamation's intention to study the effects of the proposed Federal action through a National Environmental Policy Act process. The same presentation was given to the Colorado River Management Work Group in June 2003, in Las Vegas, Nevada.

FISH AND WILDLIFE COORDINATION

In accordance with the Fish and Wildlife Coordination Act of 1934, as amended, the U.S. Fish and Wildlife Service and Bureau of Reclamation discussed potential impacts of the proposed action on several occasions during the development of this environmental assessment. The U.S. Fish and Wildlife Service and the Bureau of Reclamation are in agreement that there are no undisclosed effects likely to occur on species covered by the Fish and Wildlife Coordination Act and that no additional actions by the Bureau of Reclamation are necessary to address known or suspected effects.

CULTURAL RESOURES

The process of consultation over cultural resources is in progress. No adverse effects are anticipated.

DISTRIBUTION LIST

Federal Agencies

Corps of Engineers
Los Angeles District, Upland, California
Department of Energy
Contracts Management Division, Las Vegas, Nevada
Western Area Power Administration, Desert Southwest Region, Phoenix, Arizona; Golden, Colorado; Lakewood, Colorado; Montrose, Colorado
Western Area Power Administration, Power Marketing Research Management, Phoenix, Arizona; Salt Lake City, Utah
Department of the Interior
Bureau of Indian Affairs, Branch of Rights Protection, Albuquerque, New Mexico; Branch of Water Resources, Phoenix, Arizona; Colorado River Agency, Parker, Arizona; Coolidge, Arizona; Pacific Region Office, Sacramento, California; Parker, Arizona; Phoenix, Arizona; Southern California Office, Riverside, California; Yuma, Arizona
Bureau of Land Management, Denver, Colorado; Lakewood, Colorado; Salt Lake City, Utah
Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada; Lower Colorado Region, Native American Affairs Office, Phoenix, Arizona; Office of the Commissioner, Washington, D. C.; Reclamation Service Center, Denver, Colorado; Upper Colorado Region, Native American Affairs Office, Salt Lake City, Utah; Upper Colorado Region, Salt Lake City, Utah
Office of Environmental Affairs, San Francisco, California
Office of the Field Solicitor, Phoenix, Arizona
Office of the Solicitor, Washington, D.C.
U. S. Fish and Wildlife Service, Phoenix, Arizona; Arizona Ecological Services Office, Phoenix, Arizona; Region 2, Phoenix, Arizona; Denver, Colorado; Southwestern Region, Albuquerque, New Mexico; Salt Lake City, Utah
International Boundary and Water Commission, El Paso, Texas; Yuma, Arizona; Mexico Section, Calexico, California
National Biological Service, Fort Collins, Colorado
National Park Service, Colorado Plateau System Support Office, Denver, Colorado; Dinosaur National Park, Dinosaur, Colorado; Fort Collins, Colorado; Grand Canyon, Arizona; Lake Mead National Recreation Area, Boulder City, Nevada; Page Arizona
U.S. Geological Survey, Boulder, Colorado; Flagstaff, Arizona; Tucson, Arizona
Department of Justice
Office of the Attorney General, Window Rock, Arizona
Environmental Protection Agency
Region VIII, Denver, Colorado; Region IX, San Francisco, California

State Agencies

Arizona Department of Water Resources, Phoenix, Arizona
Arizona Game and Fish Department, Environmental Compliance, Phoenix, Arizona

Arizona Game and Fish Department, Phoenix, Arizona
Arizona Game and Fish Department, Wildlife Management, Phoenix, Arizona
Colorado Office of the Attorney General, Denver, Colorado
Colorado River Board of California, Glendale, California
Colorado River Commission of Nevada, Las Vegas, Nevada
Colorado River Coordinator, Utah State Office, Salt Lake City, Utah
Colorado Water Commission Board, Denver, Colorado
Colorado Water Conservation Board, Denver, Colorado
Nevada Department of Wildlife, Las Vegas, Nevada
New Mexico Interstate Stream Commission, Santa Fe, New Mexico
State of New Mexico, Interstate Stream Commission, Santa Fe, New Mexico
State of Wyoming, State Engineers Office, Cheyenne, Wyoming
State Water Resource Control Board, Division of Water Rights, Sacramento, California
Utah Attorney Generals Office, Salt Lake City, Utah
Utah Division of Water Resources, Salt Lake City, Utah
Wyoming Attorney General, Water and Natural Resources Division, Cheyenne, Wyoming

Indian Tribes

Agua Caliente Band of Mission Indians, Palm Springs, California
Ak Chin Indian Community, Maricopa, Arizona
Chemehuevi Indian Tribe, Chemehuevi Valley, California
Chemehuevi Tribe, Havasu Lake, California
Cocopah Tribe, Yuma, Arizona
Colorado River Indian Tribes, Parker, Arizona
Fort Mohave Tribe, Needles, California
Gila River Indian Community, Sacaton, Arizona
Havasupai Tribal Council, Supai, Arizona
Hopi Tribe, Kykotsmovi, Arizona
Hualapai Tribe, Peach Springs, Arizona
Jicarilla Apache Tribe, Dulce, New Mexico
Kaibab Paiute Tribal Council, Fredonia, Arizona
Mohave Apache Community Council, Fountain Hills, Arizona
Navajo Nation, Window Rock, Arizona
Northern Ute Tribe, Uintah and Ouray Reservation, Ft. Duchesne, Utah
Paiute Indian Tribe of Utah, Cedar City, Utah
Pascua Yaqui Tribe, Tucson, Arizona
Quechan Indian Tribe, Yuma, Arizona
Salt River Pima Maricopa Indian Community Council, Scottsdale, Arizona
San Carlos Tribal Council, San Carlos, Arizona
San Juan Southern Paiute Tribe, Tuba City, Arizona
Shoshone and Arapaho Tribes, Fort Washakie, Wyoming
Southern Ute Indian Tribe, Ignacio, Colorado
Tohono Oodham Nation, Sells, Arizona
Tonto Apache Tribal Council, Payson, Arizona

Torres-Martinez Desert Cahuilla Tribal Council, Thermal, California
Ute Business Committee, Ft. Duchesne, Utah
Ute Mountain Ute Tribe, Towaoc, Colorado
Yavapai Apache Nation, Camp Verde, Arizona
Yavapai Prescott Indian Tribe, Prescott, Arizona
Zuni Pueblo, Zuni, New Mexico

Interested Organizations and Individuals

Agri-Business Council of Arizona, Inc., Phoenix, Arizona
AHA MACAV Power Service for Fort Mohave Indian Tribe, Mohave Valley, Arizona
American Water Resources, Inc., Colorado Springs, Colorado
Arizona Flycasters/Trout Unlimited, Mesa, Arizona
Arizona Municipal Power Users Association, Phoenix, Arizona
Arizona People for the USA, Huachuca City, Arizona
Arizona Power Authority, Phoenix, Arizona
Arizona Power Pooling Association, City of Mesa Electric Utility, Mesa, Arizona
Azusa Light and Water Department, Azusa, California
Cadiz, Inc., Santa Monica, California
California Coop Fishery Research Unit, Humbolt State University, Arcata, California
Canyoneers Inc., Flagstaff, Arizona
Central Arizona Water Conservation District, Phoenix, Arizona
Central Utah Water Conservancy District, Orem, Utah
City of Anaheim, Anaheim, California
City of Banning, Banning, California
City of Boulder City, Boulder City, Nevada
City of Bountiful, Bountiful, Utah
City of Burbank, Burbank, California
City of Colton Utility Department, Colton, California
City of Glendale, Glendale, California
City of Henderson and Southern Nevada Water Authority, San Francisco, California
City of Needles, Needles, California
City of Pasadena, Pasadena, California
City of Riverside, Riverside, California
City of Vernon, Vernon, California
Coachella Valley Water District, Coachella, California
Colorado River Energy Distributors Association, Tempe, Arizona
Colorado River Management, Phoenix, Arizona
Colorado River Task Force, Sierra Club, Crested Butte, Colorado
Colorado River Water Conservation District, Glenwood Springs, Colorado
Colorado Water Conservation Board, Denver, Colorado
Defenders of Wildlife, Washington, D.C.
Denver Water Department, Denver, Colorado
Department of Water and Power, City of Los Angeles, Los Angeles, California
Desert Flycasters, Chandler, Arizona

Duke Energy, Salt Lake City, Utah
Electrical Districts Nos. 1 and 3, Maricopa, Arizona
Environmental Defense Fund, Boulder, Colorado
Environmental Law Foundation, Oakland, California
Friends of Arizona Rivers, Phoenix, Arizona
Friends of the River, Sacramento, California
Glen Canyon Action Network, Moab, Utah
Glen Canyon Institute, Flagstaff, Arizona
Grand Canyon River Guides, Flagstaff, Arizona
Grand Canyon Trust, Flagstaff, Arizona
Hopi Cultural Preservation Center, Flagstaff, Arizona
Imperial Irrigation District, Imperial, California
Keller-Bliesner Engineering, Logan, Utah
Lake Havasu City, Lake Havasu City, Arizona
Land and Water Fund of the Rockies, Boulder, Colorado
Las Vegas Sun Newspaper, Las Vegas, Nevada
Las Vegas Valley Water District, Las Vegas, Nevada
Los Angeles Department of Water and Power, Los Angeles, California
Maricopa Water District, Waddell, Arizona
Metropolitan Water District of Southern California, Los Angeles, California
MSIDD-CAIDD, Maricopa, Arizona
Murray City Power, Murray, Utah
National Wildlife Federation, Vienna, Virginia
Natural Resource Consulting Engineers, Fort Collins, Colorado
Natural Resources Defense Council, Los Angeles, California
Navigant Consulting, Inc., Boulder City, Colorado
Northern Las Vegas and Southern Nevada Water Authority, North Las Vegas, Nevada
Northwest Regional Office, American Rivers, Seattle, Washington
Pacific Institute for Studies in Development, Environment and Security, Oakland, California
Pacific Institute, Oakland, California
Salt River Project, Phoenix, Arizona
San Diego County Water Authority, San Diego, California
Shields Entomology, Brawley, California
Sierra Club, Colorado River Task Force, Salt Lake City, Utah
Sierra Club, Oakland, California
Sonoran Institute, Tucson, Arizona
Southern California Edison Company, Rosemead, California
Southern Nevada Water Authority
Southwest Center for Biological Diversity, Santa Ysabel, California; Tucson, Arizona
Southwest Rivers, Flagstaff, Arizona
Southwest Water Conservation District, Durango, Colorado
The Mary Orton Company, Phoenix, Arizona
The Nature Conservancy Arizona Chapter, Tucson, Arizona
The Southern Nevada Water Authority, Las Vegas, Nevada
Tohono Oodham Utility Authority, Sells, Arizona

Tohono Oodham Water Projects Office, Tucson, Arizona
Tonopah Irrigation District, Tonopah, Arizona
Town of Fredonia, Fredonia, Arizona
Town of Thatcher, Thatcher, Arizona
Town of Wickenburg, Wickenburg, Arizona
Tri-State Generation and Transmission Association, Inc., Denver, Colorado
UAMPS, Salt Lake City, Utah
Unit B Irrigation and Drainage District, Somerton, Arizona
Upper Colorado River Commission, Salt Lake City, Utah
Water Education Foundation, Sacramento, California
Wellton-Mohawk Irrigation and Drainage District, Wellton, Arizona
Western Municipal Water District, Riverside, California
Yuma County Water Users Association, Yuma, Arizona
Yuma Irrigation District, Yuma, Arizona
Yuma Mesa Irrigation and Drainage District, Yuma, Arizona

A copy of the distribution list is available upon request.

LIST OF PREPARERS

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ATTACHMENT A

Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537)

These Operating Criteria are promulgated in compliance with Section 602 of Public Law 90-537. They are to control the coordinated long-range operation of the storage reservoirs in the Colorado River Basin constructed under the authority of the Colorado River Storage Project Act (hereinafter "Upper Basin Storage Reservoirs") and the Boulder Canyon Project Act (Lake Mead). The Operating Criteria will be administered consistent with applicable Federal laws, the Mexican Water Treaty, interstate compacts, and decrees relating to the use of the waters of the Colorado River.

The Secretary of the Interior (hereinafter the "Secretary") may modify the Operating Criteria from time to time in accordance with Section 602(b) of P.L. 90-537. The Secretary will sponsor a formal review of the Operating Criteria at least every 5 years, with participation by State representatives as each Governor may designate and such other parties and agencies as the Secretary may deem appropriate.

I. Annual Report

(1) On January 1, 1972, and on January 1 of each year thereafter, the Secretary shall transmit to the Congress and to the Governors of the Colorado River Basin States a report describing the actual operation under the adopted criteria for the preceding compact water year and the projected plan of operation for the current year.

(2) The plan of operation shall include such detailed rules and quantities as may be necessary and consistent with the criteria contained herein, and shall reflect appropriate consideration of the uses of the reservoirs for all purposes, including flood control, river regulation, beneficial consumptive uses, power production, water quality control, recreation, enhancement of fish and wildlife, and other environmental factors. The projected plan of operation may be revised to reflect the current hydrologic conditions, and the Congress and the Governors of the Colorado River Basin States shall be advised of any changes by June of each year.

II. Operation of Upper Basin Reservoirs

(1) The annual plan of operation shall include a determination by the Secretary of the quantity of water considered necessary as of September 30 of that year to be in storage as required by Section 602(a) of P.L. 90-537 (hereinafter "602(a) storage"). The quantity of 602(a) storage shall be determined by the Secretary after consideration of all applicable laws and relevant factors, including, but not limited to, the following:

(a) Historic streamflows;

(b) The most critical period of record;

(c) Probabilities of water supply;

(d) Estimated future depletions in the upper basin, including the effects of recurrence of critical periods of water supply;

(e) The "Report of the Committee on Probabilities and Test Studies to the Task Force on Operating Criteria for the Colorado River," dated October 30, 1969, and such additional studies as the Secretary deems necessary;

(f) The necessity to assure that upper basin consumptive uses not be impaired because of failure to store sufficient water to assure deliveries under Section 602(a)(1) and (2) of P.L. 90-537.

(2) If, in the plan of operation, either:

(a) the Upper Basin Storage Reservoirs active storage forecast for September 30 of the current year is less than the quantity of 602(a) storage determined by the Secretary under Article II (1) hereof, for that date; or

(b) the Lake Powell active storage forecast for that date is less than the Lake Mead active storage forecast for that date:

the objective shall be to maintain a minimum release of water from Lake Powell of 8.23 million acre-feet for that year. However, for the years ending September 30, 1971 and 1972, the release may be greater than 8.23 million acre-feet if necessary to deliver 75,000,000 acre-feet at Lee Ferry for the 10-year period ending September 30, 1972.

(3) If, in the plan of operation, the Upper Basin Storage Reservoirs active storage forecast for September 30 of the current water year is greater than the quantity of 602(a) storage determination for that date, water shall be released annually from Lake Powell at a rate greater than 8.23 million acre-feet per year to the extent necessary to accomplish any or all of the following objectives:

(a) to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in Article III (e) of the Colorado River Compact, but no such releases shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead,

(b) to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and

(c) to avoid anticipated spills from Lake Powell.

(4) In the application of Article II (3)(b) herein, the annual release will be made to the extent that it can be passed through Glen Canyon Powerplant when operated at the available capability of the powerplant. Any water thus retained in Lake Powell to avoid bypass of water at the Glen Canyon Powerplant will be released through the Glen Canyon Powerplant as soon as practicable to equalize the active storage in Lake Powell and Lake Mead.

(5) Releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact.

III. Operation of Lake Mead

(1) Water released from Lake Powell, plus the tributary inflows between Lake Powell and Lake Mead, shall be regulated in Lake Mead and either pumped from Lake Mead or released to the Colorado River to meet requirements as follows:

(a) Mexican Treaty obligations;

(b) Reasonable consumptive use requirements of mainstream users in the Lower Basin;
(c) Net river losses;
(d) Net reservoir losses;
(e) Regulatory wastes.

(2) Until such time as mainstream water is delivered by means of the Central Arizona Project, the consumptive use requirements of Article III (1)(b) of these Operating Criteria will be met.

(3) After commencement of delivery of mainstream water by means of the Central Arizona Project, the consumptive use requirements of Article III (1)(b) of these Operating Criteria will be met to the following extent:

(a) Normal: The annual pumping and release from Lake Mead will be sufficient to satisfy 7,500,000 acre-feet of annual consumptive use in accordance with the decree in *Arizona v. California*, 376 U.S. 340 (1964).

(b) Surplus: The Secretary shall determine from time to time when water in quantities greater than "Normal" is available for either pumping or release from Lake Mead pursuant to Article II (b)(2) of the decree in *Arizona v. California* after consideration of all relevant factors, including, but not limited to, the following:

(i) the requirements stated in Article III (1) of these Operating Criteria;
(ii) requests for water by holders of water delivery contracts with the United States, and of other rights recognized in the decree in *Arizona v. California*;
(iii) actual and forecast quantities of active storage in Lake Mead and the Upper Basin Storage Reservoirs; and
(iv) estimated net inflow to Lake Mead.

(c) Shortage: The Secretary shall determine from time to time when insufficient mainstream water is available to satisfy annual consumptive use requirements of 7,500,000 acre-feet after consideration of all relevant factors, including, but not limited to, the following:

(i) the requirements stated in Article III (1) of these Operating Criteria;
(ii) actual and forecast quantities of active storage in Lake Mead;
(iii) estimate of net inflow to Lake Mead for the current year;
(iv) historic streamflows, including the most critical period of record;
(v) priorities set forth in Article II (A) of the decree in *Arizona v. California*; and
(vi) the purposes stated in Article I (2) of these Operating Criteria.

The shortage provisions of Article II (B)(3) of the decree in *Arizona v. California* shall thereupon become effective and consumptive uses from the mainstream shall be restricted to the extent determined by the Secretary to be required by Section 301(b) of Public Law 90-537.

IV. Definitions

(1) In addition to the definitions in Section 606 of P.L. 90-537, the following shall also apply:

(a) “Spills,” as used in Article II (3)(c) herein, means water released from Lake Powell which cannot be utilized for project purposes, including, but not limited to, the generation of power and energy.
(b) “Surplus,” as used in Article III (3)(b) herein, is water which can be used to meet consumptive use demands in the three Lower Division States in excess of 7,500,000 acre-feet annually. The term “surplus” as used in these Operating Criteria is not to be construed as applied to, being interpretive of, or in any manner having reference to the term “surplus” in the Colorado River Compact.
(c) “Net inflow to Lake Mead,” as used in Article III (3)(b)(iv) and (c)(iii) herein, represents the annual inflow to Lake Mead in excess of losses from Lake Mead.
(d) “Available capability,” used in Article II (4) herein, means that portion of the total capacity of the powerplant that is physically available for generation.

ATTACHMENT B

Mathematical Expression of the 602(a) Storage Algorithm

The current implementation of the 602(a) storage requirement in RiverWare duplicates the original CRSS calculation. It computes the storage necessary in the Upper Basin to meet the minimum objective release and Upper Basin depletions over the next "n" years, assuming the inflow over that period would follow that seen in the most "critical period on record." The critical period in the Colorado River Basin occurred in 1953-1964, a length of 12 years. Inflows from these years are used in the calculation of 602(a) storage.

At the beginning of each calendar year, a value for 602(a) storage is computed by the following formula:

$$602(a) = \{(UBDepletion + UBEvap) * (1 - percentShort/ 100) + minObjRel - criticalPeriodInflow\}* 12 + minPowerPoolStorage$$

Where:

- 602(a) = the 602(a) storage requirement
- UBDepletion = the average over the next 12 years of the Upper Basin scheduled depletions
- UBEvap = the average annual evaporation loss in the Upper Basin: currently set to 560 thousand acre-feet (taf)
- percentShort = the percent shortage that will be applied to Upper Basin depletions during the critical period (currently set to zero)
- minObjRel = the minimum objective release to the Lower Basin (currently set to 8.23 million acre-feet)
- criticalPeriodInflow = average annual natural inflow into the Upper Basin during the critical period (1953-1964) (currently set to 12.18 million acre-feet**)**
- minPowerPoolStorage = the amount of minimum power pool to be preserved in Upper Basin reservoirs (currently set to 5.179 million acre-feet)

Example Calculation

If on September 30, 2004:

Storage at Flaming Gorge Reservoir	3,366 taf	6030.5 feet
Storage at Navajo Reservoir	872 taf	6015.6 feet
Storage at Blue Mesa Reservoir	680 taf	7503.0 feet
Storage at Lake Powell	14,630 taf	3628.0 feet
Projected average annual Upper Basin depletion 2005-2016	4,581 taf	

Calculated 602(a) Storage using the algorithm would be:

602(a) = {(4,581 taf + 560 taf) * (1 – 0 taf/ 100) + 8,230 taf
– 12,180 taf}* 12 + 5,179 taf

= 19,471 taf

Combined Upper Basin Storage = 3,366 taf + 872 taf + 680 taf + 14,630 taf

= 19,548 taf

In this example, Upper Basin Storage is greater than the storage calculated by the 602(a) algorithm. In the No Action Alternative, equalization releases would have been made, while under the Proposed Action Alternative, equalization releases would not have been made as Lake Powell is below 14,850 taf (elevation 3,630 feet).

ATTACHMENT C

Sensitivity Analysis With Surplus Delivered Under the 70R Strategy

In the Colorado River Interim Surplus Guidelines the 70R strategy was designated for use in certain situations. Because the Quantification Settlement Agreement was not executed by December 31, 2002, calendar year 2003 was declared a "normal" year under the 70R strategy. The use of the 70R strategy has an effect on the results of the analysis of the impacts of the Proposed Action Alternative.

The Colorado River Simulation System/RiverWare model that was used for the main analysis was altered to analyze the status of the system if surplus water in the Lower Basin was made available only under the 70R strategy. The modification entailed removing the full domestic and partial domestic surplus portion of the Colorado River Interim Surplus Guidelines and extending the 70R strategy to cover 2003-2016 as well as 2017-2050.

An analysis of the No Action and Proposed Action Alternatives was made using the 70R strategy for surplus determinations for use by the Lower Division States of Arizona, California, and Nevada. The results of the analysis were compared with the model runs used in this environmental assessment (which determines Lower Basin surplus under the Colorado River Interim Surplus Guidelines assuming California has met all required actions). A comparison of these two sets of model runs is shown below:

Area	Magnitude of Change Under Interim Surplus Guidelines	Magnitude of Change Under the 70R Strategy for Surplus
Any Impact	12% (10 traces)	8% (7 traces)
Maximum Change in Lake Powell Pool Elevation	6.39 feet	3.18 feet
Maximum Change in Lake Mead Pool Elevation	4.12 feet	3.54 feet
Lower Basin Water Supply	1% Probability of No Partial Domestic Surplus	No Impact
Water Supply to Mexico	No Impact	No Impact

As described in the table above, use of the 70R strategy for Lower Basin surplus declarations results in less impacts to the Colorado River system. If the system is operated with the 70R

strategy, impacts from the Proposed Action Alternative will be less than those described by the analysis presented in the main body of this document.

ATTACHMENT D

Comment Letters and Responses

This section contains copies of the comment letters received by the Bureau of Reclamation (Reclamation) for the Adoption of an Interim 602(a) Storage Guideline Draft Environmental Assessment (EA). Also included are Reclamation's responses to the specific issues raised in the comment letters.

Each comment letter has been subdivided into specific issues for which Reclamation has prepared a response. Individual issues are indicated with vertical lines marked in the left margin of each letter, with sequential numbering that indicates a reference number for each issue. Responses to each issue are numbered accordingly and are presented to the right of each letter.

Comment Letters and Responses

Table of Contents

ORIGINAL

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

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Mr. Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Dear Mr. Ryan:

This responds to the United States Bureau of Reclamation Regional Director Rick L. Gold's September 30, 2003 memorandum to interested parties regarding the availability of a draft environmental assessment for adoption of an interim 602(a) storage guideline for management of the Colorado River. The subject guideline will assist the Secretary of Interior in making a determination of the quantity of water considered necessary as of September 30 of each year, as required by Article II (1) of the 1970 Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs pursuant to the Colorado River Basin Project Act of September 30, 1968. This determination is important because the 602(a) storage requirement is the "trigger" point for making storage equalization releases from Lake Powell to Lake Mead. The proposed 602(a) storage guideline would remain in effect through calendar year 2016.

The United States Section, International Boundary and Water Commission (USIBWC), has reviewed the subject draft EA. According to the draft EA, the Proposed Action Alternative is not expected to impact upon treaty deliveries to Mexico. The USIBWC concurs in the USBR's finding and supports the Proposed Action Alternative to adopt the Basin States' recommendation to limit 602(a) storage equalization releases when the storage level in Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30 as an added consideration in the 602(a) determination through the year 2016. Under the Proposed Action Alternative, water year releases from Lake Powell would be the minimum objective release of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30.

1

Sincerely,

Douglas Echlin
Acting Chief
Environmental Management Division

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

1: Comment noted.

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RESOURCES

Michael O. Leavitt, Governor
Robert L. Morgan, Executive Director
D. Larry Anderson, Division Director

1594 West North Temple, Suite 310
PO Box 146201
Salt Lake City, UT 84114-6201
801-538-7230
801-538-7279 (Fax)

October 24, 2003

Tom Ryan
U.S. Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street, Room 6107
Salt Lake City, Utah 84138-1147

Mr. Ryan

On behalf of the state of Utah and as the Governor's representative for Colorado River issues, I thank the Bureau for the opportunity to review and comment on the Environmental Assessment (EA) for Adoption of an Interim 602(a) Storage Guideline. Based on the draft EA, the Bureau has a good understanding of the reasons behind the inclusion of the upper basin states 602(a) Lake Powell storage requirement in the original Basin State Interim Surplus Guidelines proposal. Utah strongly supports the adoption of the proposed interim 602(a) storage

1 guidelines, that not less than 14.85 MAF of storage (elevation 3630 feet) be used as the 602(a) storage level at Lake Powell through the term of the Interim Surplus Guidelines.

1: Comment noted.

Based on the analysis of the EA regarding the impact of this guideline, it is evident that there will be very minimal if any impacts on the environment or water supply. An important benefit for Utah and the Four Corners region will be the support to the recreation industry around Lake Powell. While variations in water levels

2 anticipated under the new guideline are insignificant to water supply, the opportunity of maintaining higher water levels in Lake Powell will positively impact the public's perception of the availability of recreation in the region. This public perception is of great importance to maintaining the economic engine of recreation in Southeastern Utah around Lake Powell.

2: Comment noted.

As part of the review, Utah was troubled by the assumption that the minimum annual release is assumed to be 8.23 MAF. While the Long Range Operating Criteria call for ". . . the objective shall be to maintain a minimum release of water from Lake Powell of 8.23 million acre-feet *for that year* . . ." (Long Range Operating Criteria

3 II2(b) emphasis added). This statement from the Operating Criteria, is not interpreted by Utah or any of the Upper Basin States as requiring the annual release from Lake Powell to be 8.23 MAF. The determination of the yearly release from Lake Powell is part of the Annual Operating Plan development and is done on a yearly basis and may in fact be less than 8.23 MAF and still be in compliance with the Colorado River Compact which is the governing "Law of the River".

3: Glen Canyon Dam is operated according to the Long-Range Operating Criteria as discussed in the EA. Neither the Proposed Action Alternative nor the EA modifies the existing Long-Range Operating Criteria in any manner. The EA does not address any potential disparities between the Long-Range Operating Criteria and the Colorado River Compact. Concerns over the content of the Long-Range Operating Criteria, and specific concerns over the relationship between the Colorado River Compact and the Long-Range Operating Criteria, are most appropriately addressed through the Long-Range Operating Criteria review process.

There is a subtle but significant difference between a "required minimum annual release" and an objective

4 for a minimum release. Utah urges the Bureau of Reclamation to distinguish this difference in the Final EA and acknowledge that releases from Lake Powell may be less than 8.23 MAF in any one year and still be in compliance with the Compact.

4: Reclamation has modified the language throughout the EA to make it consistent with the Long-Range Operating Criteria, so as to reflect that the minimum release of water from Lake Powell of 8.23 million acre-feet is an objective.

Thank You,

D. Larry Anderson P.E.
Director

CC: Colorado River Basin States Representatives
Robert Morgan, Utah DNR Executive Director
Wayne Cook, Upper Colorado River Commission

Providing customer service for Water Resources planning, development and conservation

COMMENT LETTER

RESPONSES

ORIGINAL

a 102903-3

NEW MEXICO INTERSTATE STREAM COMMISSION

BATAAN MEMORIAL BUILDING, ROOM 101
STATE CAPITOL
POST OFFICE BOX 25102
SANTA FE, NEW MEXICO 87504-5102
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OCT OVERNIGHT

PJ-1310
GF
3722792
UC3384
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October 28, 2003

Mr. Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Dear Mr. Ryan:

This office has reviewed the September 2002 Draft Environmental Assessment (EA) for Adoption of an Interim 602(a) Storage Guideline and submits the following comments.

1 Due to the continuing decline in stored water in both Lake Powell and Lake Mead, implementation of the Storage Guideline is crucial. We strongly urge the Bureau of Reclamation to adopt the 602(a) Storage Guideline as proposed regarding adoption of not less than 14.85 million acre-feet (maf) as the 602(a) storage level at Lake Powell through the year 2016.

2 We do have concern about the EA interpretation of certain language of the Criteria for Long-Range Operation of Colorado River Reservoirs (Operating Criteria). Throughout the document there is language that states or suggests that a minimum annual release of 8.23 maf will be made from Lake Powell. The analysis of the EA apparently is based on the assumption that not less than 8.23 maf will be released from Lake Powell in any one year. This office, as well as the other Upper Division States and the Upper Colorado River Commission, have previously gone on record as disagreeing with an interpretation that the Operating Criteria state or suggest such a minimum annual release quantity. Such a minimum release amount would not be consistent with provisions of the Colorado River Compact and the Upper Colorado River Basin Compact. We reiterate that the Operating Criteria do not and cannot be interpreted to dictate such a minimum annual release amount. To do so would be contrary to the law.

3 The Operating Criteria cannot override provisions of the Compacts. The Operating Criteria are subject to the Compacts. The Compact obligation of the Upper Division States under Article III(d) of the Colorado River Compact is to not deplete the flow of the river at Lee Ferry below a ten-year running average of 7.5 maf per year.

NOTICE IF YOU DETACH ENCLOSURES PLEASE INSERT CODE NO.______

1: Comment noted.

2: See response to Comment 2-4.

3: See response to Comment 2-3 and Comment 9-9.

4 We appreciate your consideration of the concern stated herein. We request that the Bureau of Reclamation revise the language in the final EA and the Record of Decision to reflect our position that the release from Lake Powell may be less than 8.23 maf in any one year.

Thank you for the opportunity to review the EA and provide comments.

Sincerely,

for Philip B. Mutz
Upper Colorado River Commissioner

Jrb/Colorado/commentoneare602astoragef06

4: See response to Comment 2.4.

The Metropolitan Water District of Southern California's Comments on the
U.S. Bureau of Reclamation's September 2003
"Adoption of an Interim 602(a) Storage Guideline Draft Environmental Assessment"

1. Revise "Lower Basin" to "Lower Division states" to more precisely specify the geographic area, which can receive surplus water under the Interim Surplus Guidelines, which were the subject of the draft environmental impact statement discussed in this sentence. (Page iv, paragraph 3, line 3; page 4, paragraph 2[1], line 6; page 4, paragraph 3, line 5; Attachment C, paragraph 2, line 2)

1: Per your comment the EA has been modified.

2. Revise "Upper Basin uses (depletions) have continually increased" to "Upper Basin uses (depletions) have generally increased". This is as Upper Colorado River Basin estimated use declined from 4.046 million acre-feet in 1989 to 3.8042 million acre-feet in 1990 according to the U.S. Bureau of Reclamation's (Reclamation) "Colorado River Consumptive Uses and Losses Report, 1986-1990", the latest report in this series available at http://www.usbr.gov/uc/envprog/environment/dwnloads.html#crsulr. (Page 7, last line)

2: Per your comment the EA has been modified.

3. Revise "surplus determinations in the Lower Basin are now being made using the 70R strategy[13] and will continue to be made under 70R until California completes required actions" to "surplus determinations in the Lower Division states were being made using the 70R strategy[13] until October 10, 2003 when California completed all required actions". This is to update the Environmental Assessment to account for events, which have taken place since publication of this draft document. (Page 14, paragraph 5, lines 3 and 4)

3: The EA has been modified to reflect the events (specifically the Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement) that have taken place since the publication of the draft EA.

4. Revise "affect" to "effect" for grammatical purposes. (Page 16, paragraph 1, line 5)

4: Per your comment the EA has been modified.

5. Revise "Proposed Alternative Alternatives" to "Proposed Action Alternatives" to be consistent in the description of this alternative throughout the document. (Page 18, paragraph 1, line 2)

5: Per your comment the EA has been modified.

6. In Figure 3.4, the seven pairs of bars on the bar chart's x-axis are labeled "8.23 maf", "8.23 to 10 maf", "10 to 11.5 maf", etc. This labeling implies for example that a Lake Powell water year release of 8.23 maf could be shown as part of either the 8.23-maf bar or the 8.23 to 10-maf bar. To avoid this implication, revise the labels on the x-axis from "8.23 to 10 maf" to 8.24 to 10 maf"; from "10 to 11.5 maf" to "10.01 to 11.5 maf" etc. (Page 20)

6: Per your comment the EA has been modified.

7. Please explain why Reclamation has chosen to show the 90th, 50th, and 10th percentile values for Lake Mead end-of-December water surface elevations in Figure 3.7, as Figure 3.2 shows these values for Lake Powell end-of-July water surface elevations. (Page 23, paragraph 2, line 3)

7: Reclamation analyzed and displayed water surface elevations for end-of-July for Lake Powell and end-of-December for Lake Mead in the Draft EA and has done so in the Final EA as well. This is consistent with the Colorado River Interim Surplus Criteria Final Environmental Impact Statement. End of year values are of highest concern at Lake Mead, primarily because the surplus thresholds as identified in the FEIS and Interim Surplus Guidelines Record of Decision use end of year water surface elevations at Lake Mead. End-of-July water surface elevations are of primary concern at Lake Powell because this is the time of year when the reservoir typically reaches its annual peak.

[1] In specifying the locations of text quoted in these comments, the first partial paragraph on a page is considered to be paragraph 1.

8	8. Revise "reviewed the Salinity Control Program in 2002. The program as reviewed enables the criteria" to "reviewed the Water Quality Standards for Salinity in 2002, including the numeric criteria and the plan of implementation for salinity control (Plan). The Plan as described in the Review enables the numeric criteria". This more precisely describes the activities, which the Colorado River Basin Salinity Control Forum took in 2002. (Page 30, paragraph 4, lines 5 and 6)	8: Per your comment the EA has been modified.
9	9. Revise "Guidelines in that that the Proposed Action Alternative" to "Guidelines in that the Proposed Action Alternative" for grammatical purposes. (Page 37, paragraph 4, line 2)	9: Per your comment the EA has been modified.
10	10. Revise "The Proposed Action Alternative in this environmental assessment; however," to "The Proposed Action Alternative in this environmental assessment, however" for grammatical purposes. (Page 37, paragraph 4, line 10)	10: Per your comment the EA has been modified.
11	11. Revise "affects" to "effects" for grammatical purposes. (Page 39, paragraph 4, lines 4 and 6)	11: Per your comment the EA has been modified.
12	12. Revise the heading "State and Local Agencies" to "State Agencies" as it appears that all of the agencies listed under this heading are State agencies. (Page 40)	12: Per your comment the EA has been modified.
13	13. Revise "The modification entailed removing the surplus portion" to "The modification entailed removing the Full Domestic and Partial Domestic surplus portion" to more precisely define the methodology used. (Attachment C, paragraph 2, line 3)	13: Per your comment the EA has been modified.

JPM

10/30/03

MWD Comments on DEA for Adoption of an Interim 602(a) Storage Guideline.com

IRRIGATION & ELECTRICAL DISTRICTS ASSOCIATION OF ARIZONA

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R GALE PEARCE
PRESIDENT

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VICE-PRESIDENT

CHARLES W. SLOCUM
SECRETARY-TREASURER

ROBERT S. LYNCH
ASSISTANT SECRETARY-TREASURER

E-MAILED ONLY

October 30, 2003

Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Re: Draft Environmental Assessment for an Interim 602(a) Storage Guideline for Management of the Colorado River

Dear Mr. Ryan:

We have reviewed the draft EA on this subject and have previously commented at various meetings held by the Bureau of Reclamation on the concept of an elevation/storage floor at Lake Powell for equalization releases. We understand that temporary alterations of release criteria for Lake Mead are contemplated by the Quantification Settlement Agreement and the Interim Surplus Guidelines for the Colorado River. These changes might, under certain hydrologic circumstances, cause the equalization criteria of the Long-Range Operating Criteria to dictate equalization flows that would otherwise not occur without the temporary operations of Lake Mead under the QSA.

1

We wish to make two observations and comments on the draft EA. First, the draft EA is totally silent as to why the particular parameters are being proposed for the trigger storage/elevation levels in Lake Powell that would obviate further equalization releases. The draft EA explains the mechanics for measuring and the concept for the interim criterion being proposed but not why the numbers were selected. It has come to our attention that the specific volume number and its associated elevation were picked to avoid adverse economic impacts to recreation facilities at Lake Powell. That lack of adverse impact is briefly documented on page 32 of the draft EA. While we have no objection to that being the reason, we wish to point out that

2

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1: Comment noted.

2: Reclamation believes that this observation is consistent with the considerations of the seven Colorado River Basin States. When formulating the proposal, recreation was an important consideration in the development of the 14.85 million acre-feet (elevation 3,630 feet) 602(a) storage threshold proposed by the Colorado River Basin States. Protection of Upper Basin water supply and power generation are also important components of the guideline. Water supply, power generation, and recreation are all mentioned in the EA under the Purpose and Need.

the recreation facilities at Lake Powell are commercial operations. Certainly they are valuable commercial operations but nevertheless commercial.

That is often the characterization given to the generation of hydropower at Glen Canyon Dam as well. Thus, in the future, you will understand that our members will expect sensitivity to their commercial interests in that power equivalent to that you are demonstrating in favoring the recreation interests at Lake Powell. We believe that the setting of these elevation and storage parameters is an important precedent in balancing water supply, power generation and other needs of the region with environmental concerns. We look forward to working with you further on this activity and the natural outgrowth of this precedent that we anticipate.

2 Cont'd

Second, we do not understand why there is no proposal that the interim criteria proposed here would be suspended if the operation of the QSA is suspended. Certainly, over the next 15 years, there are a myriad of things that can go wrong with implementation of the QSA. The hammer that the Secretary of the Interior has is that the suspension of the criteria carries with it a water delivery penalty of some magnitude. However, if the drought continues, additional water under the QSA may end up being problematic. Additionally, at the end of the 15-year period, the amounts of additional water available decrease and the motivation to continue compliance with the QSA likewise decreases. We understand the problems that could be created by trying to deal with short-term suspensions and suspending these criteria within a single water year. But, in our view, the need for this additional 602(a) criterion is nonexistent in any given water year in which the QSA is suspended. Thus, at least if a QSA suspension continues over a calendar year, these criteria should likewise be inoperative through the following 9 months of the water year.

3

Thank you for the opportunity to comment on this important proposal.

Sincerely,

/s/

Robert S. Lynch
Counsel and Assistant
Secretary/Treasurer

RSL:psr
cc: IEDA Members

3: Reclamation does not expect the Colorado River Water Delivery Agreement to be suspended as suggested in your comment. The Colorado River Water Delivery Agreement of 2003 (the Quantification Settlement Agreement for purposes of Section 5(B) of the Interim Surplus Guidelines) will remain in effect at least through December 31, 2037. It is possible that benchmarks, as outlined in Section 5C of the Colorado River Interim Surplus Guidelines Record of Decision, could result in the suspension of Sections 2(B)(1) and 2(B)(2) of the Interim Surplus Guidelines through the year 2016, and for surplus to instead be based upon the 70R Strategy. However, reinstatement is possible on a yearly basis (through the year 2016) if California achieves the identified relevant benchmarks. Because of this, Reclamation believes that the 602(a) storage guideline should remain in place, on a continuous basis, through the year 2016.

10/29/03 15:41 FAX 818 543 4685 COLORADO RIVER BOARD 002

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STATE OF CALIFORNIA - THE RESOURCES AGENCY GRAY DAVIS, Governor
COLORADO RIVER BOARD OF CALIFORNIA
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DATE	Initial	To
		4138

Mr. Tom Ryan
U.S. Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Dear Mr. Ryan:

The purpose of this letter is to provide the Bureau of Reclamation (Reclamation) with the comments of the Colorado River Board of California (Board) on the draft environmental assessment (EA) associated with the adoption of an Interim 602(a) Storage Guideline. These comments are in response to a notice published in the *Federal Register* on September 30, 2003 (68 FR 189, 56317-18).

1 First, the Board believes that the draft EA has appropriately identified and analyzed the potential impacts associated with implementation of the interim 602(a) storage guideline. The Board supports Reclamation's determination that any potential impacts are not likely to be significant. Second, the Board recommends that Reclamation update the final EA to reflect the State of California's execution 2 of a Final Quantification Settlement Agreement (QSA). The QSA is described in the fourth full paragraph on page 14 of the draft EA.

3 In conclusion, the Board fully supports implementation of the interim 602(a) storage guidelines through 2016, pursuant to the position articulated in the Seven Basin States letter to Reclamation, as published in the *Federal Register* (65 FR 48531-38) on August 8, 2000.

The Board appreciates the opportunity to provide comments on the draft EA. Please feel free to contact me at (818) 543-4676 if you have any questions or require additional information.

Sincerely,

for Gerald R. Zimmerman
Executive Director

1: Comment noted.

2: See response to Comment 4-3.

3: Comment noted.

ARIZONA DEPARTMENT OF WATER RESOURCES
500 North Third Street, Phoenix, Arizona 85004
Telephone 602 417-2442
Fax 602 417-2401

October 30, 2003

JANET NAPOLITANO
Governor

HERB GUENTHER
Director

Mr. Tom Ryan
United States Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Re: Comments on "Adoption of an Interim 602(a) Storage Guideline – Draft Environmental Assessment, September 2003

Dear Mr. Ryan:

The Arizona Department of Water Resources is submitting the following comments on the subject report for your consideration.

1 | Page 9 – fourth and fifth paragraphs – It would be helpful to include graph which illustrates the discussion in these two paragraphs, similar to what shown at the Annual Operating Plan meetings held in June and in August, 2003.

2 | Page 14, fourth paragraph – The California Agencies signed the Quantification Settlement Agreement on October 16, 2003. This needs to be mentioned in the final assessment.

3 | Page 16, first paragraph – It would be helpful to show that the 12 percent probability (and any other pertinent probabilities) was derived by dividing the 10 traces, which show operational differences in the Colorado River system, by the 85 traces.

4 | Page 23, Table 3.2 – In the "Percent Change", the use of the parenthesis appears to be used incorrectly. The percent change value for 2006 should be in parenthesis because the amount of release decreased (parenthesis are used to denote a negative value). The percent change values for 2012 and 2012 are greater, so they should not have parentheses. To avoid confusion, it would be easier to display the values with "+" or "-".

5 | Attachment B – It would be useful to have a sample calculation that shows how the 602(a) trigger is determined and then used.

If you have any questions regarding these comments, please feel free to contact me.

Sincerely,

Thomas G. Carr
Manager, Colorado River Management Section
Arizona Department of Water Resources

1: The graph presented at the Annual Operating Plan consultation meeting in June, 2003 attempts to depict both the Action and No Action Alternatives in one graphic. This graph was found to be confusing to some reviewers of the Draft EA in that the relationship of the two lines (one representing the No Action Alternative and the other the Action Alternative) was not clear. After some deliberation, Reclamation decided not to use this graph because of its potential to cause confusion.

2: See response to Comment 4-3.

3: Per your comment the EA has been modified.

4: Per your comment the EA has been modified.

5: Per your comment the EA has been modified.

ORIGINAL

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October 30, 2003

Sent Via E-Mail and First Class Mail

Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138

Re: Quechan Indian Tribe's Comments On Draft Environmental Assessment For Interim 602(A) Storage Guideline For Colorado River

Dear Mr. Ryan:

We are submitting these comments on behalf of the Quechan Indian Tribe with regard to the Bureau of Reclamation's draft environmental assessment for interim 602(a) storage guideline for Colorado River. The Bureau's environmental assessment has not responded to the specific questions that the Tribe asked in its previous comments dated March 3, 2003, which are attached and incorporated hereto. 1

The Bureau has erred by issuing an environmental assessment before it completes compiling data on the location, character, and effects on cultural resources. The Bureau has no basis to predict that its guidelines will have no effect on cultural resources. EA at 35. 2

Additionally, the cumulative impacts analysis is insufficient. EA at 37. This "analysis," which is less than one page, does not mention the myriad of projects that will also reduce the quantity and quality of Colorado River water near the Fort Yuma Reservation. 3

Thank you for taking these comments under consideration.

Sincerely yours,

MORISSET, SCHLOSSER, JOZWIAK & McGAW

Mason D. Morisset

Mason D. Morisset
Attorneys for Quechan Indian Tribe

Enclosure
cc: Mike Jackson Sr., President
Keeny Escalanti Sr., Vice President
Pauline Jose, Acting Chairperson, Quechan Cultural Committee

T:\WPDOCS\02670\09751\CORRESP\2003\Ryan102803_L01.doc
slh 10/28/03

NOTICE IF YOU DETACH ENCLOSURES PLEASE INSERT CODE NO _____

1: Reclamation, in considering the implementation of the 602(a) storage guideline (Proposed Action Alternative), evaluated what level of National Environmental Policy Act compliance was appropriate. In the spring of 2003, an EA was selected because Reclamation's initial assessment of the anticipated impacts attributable to the Proposed Action Alternative was found not likely to be significant. Pursuant to the Council of Environmental Quality's regulations implementing NEPA, an EA can serve to provide analysis for determining whether to prepare an environmental impact statement [40 C.F.R. § 1508.9(a)(1)]. Preparation of an EA in this context is appropriate.

The analysis of the Proposed Action Alternative shows that there would be no reduction in flow below Parker Dam. This is stated in the section "River Flows between Hoover Dam and Imperial Dam." There is a very small probability (about 1 percent) that the Proposed Action Alternative could result in a small increase in a flood control release from Hoover Dam that would increase river flows below Parker Dam. The analysis shows that there is a 1 percent probability that flows near the Fort Yuma Reservation could increase from 13,900 cubic feet per second under the No Action Alternative, to 15,570 cubic feet per second under the Proposed Action Alternative in one calendar month. This increase is well within routine operational ranges.

The Quechan Tribe's senior water right would not be affected by the Proposed Action Alternative. The guideline does not allocate any additional Colorado River water. The Proposed Action Alternative would not have any effect on tribal water rights and allocations as stated in the section on Indian Trust Assets. Additionally, the guideline would not result in additional surplus deliveries to the Lower Division States of Arizona, California, or Nevada as outlined in the section on Water Supply.

As stated in the Water Quality section of the EA, salinity impacts below Hoover Dam would be negligible.

Because flow would not be reduced below Parker Dam, the Proposed Action Alternative would have no effect on groundwater. Electrical supply to the Fort Yuma Reservation would not be affected by the Proposed Action Alternative. There would be no impacts on agricultural uses by the Quechan Tribe.

As flows below Parker Dam would be nearly identical under the Proposed Action and No Action Alternatives, the Reclamation does not foresee an impact to the Quechan Tribe's cultural resources.

2: Reclamation asked the State Historic Preservation Officers (SHPO) and Tribal Historic Preservation Officers (THPO) to agree that it was acceptable to defer its Section 106 activities for the Adoption of an Interim 602(a) Storage Guideline to the broader identification, evaluation, and consultation process committed to in the Interim Surplus Guidelines Record of Decision. Due to the large area of potential effects considered in the surplus compliance process and the overlap with the 602(a) area of potential effects, the SHPOs and one THPO have concurred with this request for deferral. It should be noted in the response to this comment that Reclamation's cultural resource management staff have been and are continuing to work to compile all the requisite data on identification, eligibility, and effect, but that our expectation, based on the data currently available, is that there will be no historic properties remaining in the area of potential effect of reservoir operations.

3: Per your comment the Cumulative Impacts section of the EA has been expanded to include projects that affect the Lower Colorado River and the Fort Yuma Reservation.

ORIGINAL

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March 10, 2003

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Mr. Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, UT 84138

Re: Interim 602(a) Storage Guideline for Management of the Colorado River

Dear Mr. Ryan:

We are submitting these comments on behalf of the Quechan Indian Tribe ("Tribe"), in response to the Bureau's published Federal Register notice: Intent to Solicit Public Comments on the Adoption of an Interim 602(a) Storage Guideline for Management of the Colorado River and to Initiate a [NEPA] Process, 68 Fed. Reg. 4230-31 (Jan. 28, 2003). We trust that the Bureau will either prepare an environmental impact statement ("EIS"), or a thorough, readable supplement to the existing EIS.

The Tribe has a direct and substantial interest in development of the guideline. The Tribe's Fort Yuma Reservation is located in southwestern Arizona and southern California near Yuma, Arizona. The Tribe possesses present perfected rights from the mainstem of the Colorado River pursuant to the Decree and supplemental Decrees (1979 and 1984). The amounts, priority dates, and state where the rights are perfected are as follows:

4

Amount (AFY)	Acreage	Priority Date	State
51,616	7,743	Jan. 9, 1884	California

This water is diverted at Imperial Dam through the Yuma Project Reservation Division - Indian Unit. A Supreme Court decision issued on June 19, 2000 allows the Tribe to proceed with litigation to claim rights to an additional 9,000 acres of irrigable lands. Proving this claim would increase the water rights for the reservation. The priority date would also be 1884. The matter is currently being litigated.

The Tribe asks that the NEPA document address the following specific comments:

4: See response to Comment 8-1.

1. Impact on Water Flow and the Quechan Tribe's Senior Water Rights. How will implementation of the guideline directly and indirectly affect the Quechan Tribe's perfected and unperfected water rights? Will there be reduced flows from implementation of the guideline, as well as from the guideline in conjunction with the many other projects affecting the lower Colorado River?

The Tribe is also concerned that the Operating Criteria and its implementation not inappropriately facilitate, validate or permanently secure use by others of Colorado River water that the Tribe is not beneficially using. As you know, the Tribe does not have to beneficially use all of its reserved water. BOR should therefore not designate water as "surplus" to the extent that such designation makes the water available for others. The Tribe requests that BOR review its Operating Criteria with that in mind, and make any necessary modifications. Will implementation of the guideline alone, or with the other projects affecting the lower Colorado River, facilitate others' use of surplus water, which is the Tribe's unused entitlements? Specifically, we point the BOR to Council on Environmental Quality's guidance entitled, *Considering Cumulative Effects Under the National Environmental Policy Act* (Jan. 1997), which describes components of a meaningful cumulative effects review.

4 Cont'd

2. Impact on Water Salinity. Will implementation of the guideline cause a salinity rise in the stretch surrounding Imperial Dam? If so, will the increased salinity impact the quality of water taken by the Tribe? What is the cumulative salinity increase of implementation of the guideline when considered with the many projects affecting the lower Colorado River?

3. Impact on Ground water. Will implementation of the guideline cause a reduction in ground water, or in ground water levels, underlying the Fort Yuma Reservation? Will there be a cumulative reduction in or lowering of ground water underlying the Fort Yuma Reservation due to implementation of the guideline and the many projects affecting the lower Colorado River?

4. Impact on Electricity Supply. Will the Fort Yuma Reservation experience a reduced electricity supply due to (1) implementation of the guideline, or (2) the cumulative impact of implementation of the guideline and the other projects affecting the lower Colorado River? Will there be a sufficient supply to accommodate the Tribe's future plans for development?

5. Impact on Agricultural Uses. How exactly will the Tribe's and its members' agricultural uses be affected (1) by implementation of the guideline, or (2) by this and the many projects affecting the lower Colorado River?

6. Impact on Cultural Resources. Will cultural resources affiliated with the Quechan Tribe be affected by implementation of the guideline?

4 Cont'd

7. Other Issues. The Tribe asks that BOR consider whether the following events mandate modification, particularly in light of the BOR's trust responsibilities to Indian tribes and their members: (1) present and future plans for tribal water marketing and banking; (2) Arizona's and Nevada's full use of their allotments; and (3) over-allocation of the Colorado River. Please note that the Tribe has proposed a Tribal Accounting Pool (TAP) in Lake Mead to allow undeveloped tribal watership to be tracked by an in-reservoir accounting system.

Sincerely yours,

MORISSET, SCHLOSSER, HOMER, JOZWIAK & McGAW

Mason D. Morisset

MDM:SIH:pt

cc: Mike Jackson Sr., Chairman, Quechan Indian Tribe

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pat 03/10/03

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STATE OF COLORADO

Colorado Water Conservation Board
Department of Natural Resources
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Denver, Colorado 80203
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October 28, 2003

Mr. Tom Ryan
US Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138

Reference: Draft EA - Adoption of an Interim 602(a) Storage

Dear Mr. Ryan:

Thank you for the opportunity to provide comments on this important Colorado River matter. The Colorado Water Conservation Board is an agency of the State of Colorado. Its mission is to promote the protection, conservation, and development of Colorado's water resources in order to secure the greatest utilization of those resources for the benefit of present and future inhabitants of the state and to minimize the risk of flood damage and related economic loss. One of the major objectives within this mission is the protection of Colorado's interstate compact allocations, including those on the Colorado River.

By way of background, on December 4, 1998 the states of Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming provided California with proposed principles for negotiation of interim surplus operating criteria for the Lower Colorado River and Lake Powell. Subsequently, this proposal was refined and published in the Federal Register on August 8, 2000. In December 2000 Reclamation issued a Final Environmental Impact Statement on the adoption of specific criteria under which surplus water conditions would be determined in the Lower Basin. On January 16, 2001 the Secretary signed the Record of Decision Implementing the Colorado River Interim Surplus Guidelines through 2016.

1 In the December 4, 1998 letter setting forth the State's policy considerations, one of the considerations was that the impacts of any interim criteria on the Upper Basin be minimized by measures such as the establishment of interim 602(a) storage criteria or other mutually acceptable measures. It was suggested that this concern be addressed by defining 602(a) storage

NOTICE IF YOU DETACH

1: Comment noted.

1 Cont'd

under the interim criteria such that any risk of shortage during the time in which the Interim Surplus Guidelines were in effect remained with California and was not transferred to the other Basin States. This subsequently was translated into the language contained in Section V of the Colorado River Basin States proposal, which was as follows:

During the Interim Period, 602(a) storage requirements determined in accordance with article II(1) of the Criteria [Long-Range Operating Criteria] shall utilize a value of not less than 14.85 maf (elevation 3,630 feet) for Lake Powell.

2

Representatives of the Upper Colorado River Basin States have continually expressed support for the adoption of this criteria by the Secretary to operate hand-in-hand with the Colorado River Interim Surplus Guidelines adopted for the Lower Basin through 2016 as outlined in the draft EA. Furthermore, since this proposal was part of the State's proposal for interim guidelines we would not expect it to run any longer than the period during which the interim guidelines are in place, or through 2016.

2: Comment noted.

Our comments on the draft EA are as follows:

3

In general, we concur with the findings in the draft EA and believe that potential impacts from implementing the proposed 602(a) Storage Guidelines are minimal, but provide the Upper Basin an added measure of protection in drier years. We do however have one concern with the draft EA and that is with the language associated with the "minimum objective release."

3: Comment noted.

4

At the time of the adoption of the Operating Criteria, the State of Colorado made objection to certain provisions of the Operating Criteria. Specifically, the State of Colorado joined the Upper Colorado River Commission and the Upper Division States in protesting the minimum release objective of 8.23 maf of water per year from Lake Powell and in not waiving objections to other parts of the Operating Criteria. In fact, the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537)" stated specifically at Article II(5), "that releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact." See also, §§601(a) and 603(a) of the Colorado River Basin Project Act (CRBPA).

4: See response to Comment 2-3.

5

The State of Colorado continues to object to the portrayal of the minimum release objective of 8.23 maf/year as some type of requirement and to other aspects of the Operating Criteria. This amount is only a release objective, and it is the position of the State of Colorado that less than 8.23 maf may be released in any given year if circumstances warrant, and without a change in the Operating Criteria. Section 602(b) of the CRBPA provides that the Operating Criteria proposed can be modified in order to achieve the purposes specified in subsection 602(a) of that Act. Those purposes are "to comply with and carry out the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty". Therefore, irrespective of the minimum release objective specified in the Operating Criteria, the amount of water released from Lake Powell is ultimately controlled by the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty. As a

5: See response to Comment 2-4.

5 Cont'd result, an amount less than the minimum release objective may be released from Lake Powell, in order to avoid impairment or potential impairment of the beneficial consumptive use of water in any Upper Division State, if the States of the Upper Division are in compliance with the Colorado River Compact.

6 The primary purpose of Section 602 of the CRBPA is to assure that the States of the Upper Division may develop their full entitlement to the water of the Colorado River System pursuant to the Colorado River Compact, and that annual consumptive uses in the Upper Division will not be impaired or potentially impaired because of the failure to store sufficient water to make deliveries pursuant to the Mexican Water Treaty (if any deficiency exists and is chargeable to the Upper Basin) and the Colorado River Compact. However, since the States of the Upper Division have not yet developed their full entitlement to the waters of the Colorado River System available pursuant to the Colorado River Compact, and there has not yet been an

7 impairment of annual consumptive uses in any Upper Division State as a result of operations pursuant to the existing Operating Criteria, it is appropriate for Reclamation at this time to assume in the EA that they likely will not release less than 8.23 maf from Lake Powell annually through 2016. However, we do request that the EA clarify that the Basin States do not fully concur with the Long-Range Operating Criteria, or Reclamation's interpretation in the draft EA, and that neither the Long-Range Operating Criteria nor this EA will prejudice any positions in

8 this respect. This could be accomplished through use of a disclaimer similar to that used for the AOP. In addition, we suggest that language in the EA be modified as indicated in our detailed comments attached hereto.

In closing, we wish to be clear that we support the adoption of these interim 602(a) storage guidelines, but also wish to protect long-standing positions with respect to the Long-Range Operating Criteria in the process. We wish to thank Reclamation for considering our comments on this important matter. Please contact us if you have any questions regarding our comments.

Sincerely,

Dan McAuliffe
Deputy Director

Attachment

Cc:
CWCB Members
Seven Colorado River Basin State Representatives
Scott Balcomb
Wayne Cook
Jim Lochhead
Colorado River Policy Advisory Group
Randy Seaholm

6: Comment noted.

7: Reclamation concurs. Releases from Lake Powell in the Colorado River Simulation System computer modeling used in the analysis are consistent with the objective to maintain an annual release of a minimum of 8.23 million acre-feet.

8: See response to Comment 2-3.

Attachment
Comments on Draft EA
Adoption of an Interim 602(a) Storage Guideline
(Proposed deletions in strikethrough, additions underlined)

9	Page iv, 1st Para	…pursuant to the Colorado River Basin Project Act of September 30, 1968. The Long-Range Operating Criteria are subject to the terms of the Colorado River Compact and the 'Law of the River.' Any ultimate determinations of the obligations of the Upper Basin, if any, with respect to any deficiency in deliveries under the Mexican Treaty and the obligations of the Upper Basin under Article III(d) of the Colorado River Compact will control the amount released from Lake Powell. Pursuant to these determinations, releases from Lake Powell in any one-year could be more or less than 8.23 maf without change to the Long Range Operating Criteria. This EA is not intended to be a definitive interpretation on any of these documents nor to prejudice the position of any State with respect to the 'Law of the River.' This EA should be read in its entirety with that understanding.
10	Page iv, 2nd Para	"In Years w ~~When~~ projected storage in the Upper Basin is less than 602(a) storage, such storage equalization releases from Lake Powell are not made and the Secretary maintains an objective to ~~annual~~ release of ~~water from Lake Powell is limited to the~~ a minimum ~~annual release~~ of 8.23 million acre-feet as specified in the Long-Range Operating Criteria."
11	Page 1	"When storage levels are below the 602(a) storage requirement, or when reservoir storage in Lake Powell is less than Lake Mead, water is conserved in Lake Powell by maintaining an objective to ~~releasing only the minimum objective~~ release a minimum of 8.23 million acre-feet. The ~~minimum~~ objective release ~~requirement~~ and the terms for making storage equalization releases are contained in the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Long-Range Operating Criteria). The Long-Range Operating Criteria are subject to the terms of the Colorado River Compact and the 'Law of the River.' Any ultimate determinations of the obligations of the Upper Basin, if any, with respect to any deficiency in deliveries under the Mexican Treaty and the obligations of the Upper Basin under Article III(d) of the Colorado River Compact will control the amount released from Lake Powell. Pursuant to these determinations, releases from Lake Powell in any one-year could be more or less than 8.23 maf without change to the Long-Range Operating Criteria. This EA is not intended to be a definitive interpretation on any of these documents nor to prejudice the position of any State with respect to the 'Law of the River.' This EA should be read in its entirety with that understanding."
12	Page 2	"The Long-Range Operating Criteria established the minimum objective to ~~annual~~ release a minimum of 8.23 million acre-feet from Lake Powell in years when equalization releases are not required or storage is below 602(a) levels. ~~This minimum objective release assures that the Upper Division States' downstream delivery requirements are met on an annual basis.~~
13	Page 3	"Conversely, the Secretary maintains an objective ~~releases are constrained to the minimum annual~~ to release a minimum of 8.23 million acre-feet in years when ~~if~~ storage

9: Reclamation acknowledges that the Long-Range Operating Criteria are subject to the terms of the Colorado River Compact. The first paragraph of the Long-Range Operating Criteria states, "The Operating Criteria will be administered consistent with applicable Federal laws, the Mexican Water Treaty, interstate compacts, and decrees relating to the use of waters of the Colorado River." Article II(5) states, "Releases from Lake Powell pursuant to these criteria shall not prejudice the position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact." A paragraph has been added on page 2 of the EA containing this information. Also see response to Comments 2-3 and 2-4.

10: Per your comment the EA has been modified. The majority of your proposed change has been used with the exception that "the objective is to maintain a release of a minimum of 8.23 million acre-feet" has been used instead of your suggestion "the Secretary maintains an objective to release a minimum of 8.23 million acre-feet." Also see response to Comment 2-4.

11: The EA has been modified to reflect your suggested edits for the first two sentences in your comment. See response to Comment 9-9 with respect to the second portion of the comment and the language you request to add to the EA.

12: Per your comment the EA has been modified.

13: See response to Comment 9-10.

13 Cont'd		levels fall below 602(a) storage requirements, or when reservoir storage in Lake Powell is less than Lake Mead. The 602(a) storage requirement is the "trigger point" for releasing ~~additional~~ water ~~(water in excess of 8.23 million acre-feet)~~ from Lake Powell to Lake Mead to equalize storage between the two reservoirs as provided by law."	
14	Page 3	"~~Since the Long-Range Operating Criteria requires minimum deliveries of 8.23 million acre-feet, even during extended periods of drought,~~ Lake Powell (and to a lesser extent other major reservoirs upstream of Lake Powell) provides the water storage to supply the required flows of the Colorado River to the Lower Basin."	14: Per your comment the EA has been modified.
15	Page 3	"~~If water storage is above the 602(a) storage requirement, the Upper Basin can afford to release extra water downstream that is above the minimum required release of 8.23 million acre-feet per year.~~"	15: Per your comment the EA has been modified.
16	Page 4	"…releases from Lake Powell are often made that exceed ~~the minimum annual release requirement of~~ 8.23 million acre-feet."	16: Per your comment the EA has been modified.
17	Page 4	"In years w ~~W~~hen the projected Upper Basin mainstem storage is less than the 602(a) storage requirement, storage equalization releases from Lake Powell are not made, and Secretary maintains an objective to ~~the annual~~ release ~~of water from Lake Powell is limited to~~ a minimum of 8.23 million acre-feet of water from Lake Powell."	17: See response to Comment 9-10.
18	Page 5	"~~Just as the Colorado River Interim Surplus Guidelines provide a lower limit at Lake Mead for declaration of surplus through the year 2016, the proposed 602(a) storage guideline would provide a lower limit for annual releases of water in excess of 8.23 million acre-feet from Lake Powell through the year 2016.~~"	18: Your proposal is to remove a sentence from the Purpose and Need section of the EA. This statement is an important component of the Purpose and Need and needs to remain in the document. The reference to releases of 8.23 million acre-feet has been modified to state, "Just as the Colorado River Interim Surplus Guidelines provide a lower limit at Lake Mead for declaration of surplus through the year 2016, the proposed 602(a) storage guideline would provide a lower limit for annual releases of water in excess of the minimum objective release of 8.23 million acre-feet from Lake Powell through the year 2016."
19	Page 7	"As discussed in the Introduction, storage equalization releases from Lake Powell ~~(releases in excess of 8.23 million acre-feet)~~ are linked to 602(a) storage requirements."	19: Per your comment the EA has been modified.
20	Page 8	"In years w ~~W~~hen actual combined storage in these Upper Basin reservoirs at the end of any given water year (September 30) is projected to be below the computed 602(a) storage level (the line in figure 2.1), the Secretary maintains an objective to release a ~~water year releases from Glen Canyon Dam are restricted to the~~ minimum ~~objective release~~ of 8.23 million acre-feet."	20: See response to Comment 9-10.
21	iv, Page 9	"Under the Proposed Action Alternative, water year releases from Lake Powell would be made under the ~~minimum~~ objective of a minimum of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 4,630) on September 30."	21: Per your comment the EA has been modified. The majority of your proposed change has been used with the exception that "would be made with the objective" has been used instead of your suggestion "would be made under the objective."
22	Page 10	"Under the No Action and Proposed Action Alternatives, the ~~minimum~~ objective to release ~~of~~ a minimum 8.23 million acre-feet at Lake Powell would ~~continue to be met~~ be maintained. The proposed federal action does not modify the ~~minimum objective release in the~~ Long-Range Operating Criteria."	22: The EA has been modified to reflect your suggested edits in the first sentence of your comment. The second sentence has been revised to more precisely state, "The proposed federal action does not modify the Long-Range Operating Criteria in any manner."

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Brownstein | Hyatt | Farber

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DATE	Initial	To
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October 24, 2003

James S. Lochhead
Attorney-at-Law
T 970 945.5302
F 970.384 2360
jlochhead@bhfs.com

Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street, Room 6107
Salt Lake City, UT 84138-1147

Dear Tom.

I am writing on behalf of the Colorado River Water Conservation District, Denver Water Department, City of Grand Junction, Northern Colorado Water Conservancy District, Southeastern Colorado Water Conservancy District, and Southwestern Water Conservation District, with regard to the Draft Environmental Assessment for the Adoption of an Interim 602(a) Storage Guideline. These agencies are major users of water in the Colorado River Basin in Colorado, and have exercised the responsibility under Colorado law and through water rights owned by them to protect Colorado's right under the law of the river to fully use its Compact entitlement.

1 In general, these agencies support the adoption of the 602(a) Storage Guideline as proposed, as it relates to the adoption of not less than 14.85 million acre-feet (MAF) as the 602(a) storage level at Lake Powell through 2016. This issue is of immediate significance, as under average hydrology storage in Lake Powell is projected to fall below this amount. Lake Powell is the "savings account" that assures the Upper Basin it will meet its obligation under the Colorado River Compact to not deplete the flow of the River at Lee Ferry below 75 MAF every ten years, and storage levels must be maintained so as not to deplete this account.

1: Comment noted.

2 However, there are significant errors in the Draft EA, which should be corrected in the final EA and any record of decision. We object to any implication that an annual minimum release of 8.23 MAF is required under law, and to any inclusion of such a requirement in the Proposed Action Alternative. References to a minimum release requirement in the draft EA are not only misleading and inaccurate, but also unnecessary to the analysis or to the proposed 602(a) storage level.

2: See response to Comment 2-4.

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2 Cont'd

: numerous locations in the draft EA, reference is made to a release of 8.23 MAF, ; the minimum amount that may be released from Lake Powell in any one year.[1] ddditionally, the analysis in the EA is premised on the assumption that not less than .23 MAF will be released from Lake Powell in any one year.[2]

Any implication that there is an obligation to release not less than 8.23 MAF is contrary to law.

3

The Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs ("Long-Range Operating Criteria") were authorized pursuant to § 602 of the 1968 Colorado River Basin Project Act to "comply with and carry out the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty." The Long-Range Operating Criteria provide that if the amount of storage in the Upper Basin is forecast to be less than 602 (a) storage, or if the storage forecast for Lake Powell is less than Lake Mead, the Secretary will have the "objective" to maintain a minimum release of 8.23 MAF in the upcoming year.[3] This amount was ostensibly arrived at by taking the average annual Upper Basin Compact delivery requirement of 7.5 MAF, subtracting tributary inflows below Glen Canyon Dam and above Lee Ferry (about 20,000 acre feet), and adding one-half of the United States' delivery obligations under the 1944 Mexican Treaty (750,000 acre feet).

4

This calculation is obviously a matter of convenience pending greater development in the Upper Basin, and has no basis in the law, for two reasons. First, the only obligation of the Upper Division States under Article III (d) of the Colorado River Compact is assure that the flow of the River at Lee Ferry is not depleted below 75 MAF every ten years on a running average. This obligation imposes no burden or limitation on the Upper Basin to make any minimum delivery in any one year (except possibly at the end of a ten-year sequence). The Long-Range Operating Criteria cannot override the Compact. Instead, the Long-Range Operating Criteria are subject to the Compact.[4] Second, the Upper Division States disagree that they

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[1] *See, e.g.*, the attachment to this letter, which notes several erroneous references to a requirement of a minimum release of 8.23 MAF, and which proposes changes to correct these errors.

[2] *See, e.g.*, EA at pp iv-v and 9: ("Under the Proposed Action Alternative, water year releases from Lake Powell would be the minimum objective release of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630 feet) on September 30.")

[3] Operating Criteria, Article II (2). This minimum release objective appears only in the Long Range Operating Criteria. It is not provided for in the authorizing legislation in §602 of the 1968 Colorado River Basin Project Act.

[4] In fact, the introduction to the Long-Range Operating Criteria states, "The Operating Criteria will be administered consistent with applicable Federal laws, the Mexican Water Treaty, interstate compacts, and decrees relating to the use of the waters of the Colorado River." Additionally, Article II (5) of the Criteria states that the Criteria "shall not prejudice the

3: Comment noted.

4: See response to Comment 2-3 and Comment 9-9.

4 Cont'd | have any obligation to contribute half of the Mexican Treaty delivery, under any circumstance. Therefore, the Upper Division states have objected to any assertion by the Secretary that there is any actual annual minimum amount that must be released from Lake Powell.[5]

5 | The draft EA portrays the 8.23 MAF release objective as a minimum requirement. This ignores the word "objective" as contained in the Long-Range Operating Criteria.[6] The 8.23 MAF release objective must be overridden by the terms of the Compact and the ultimate determination of the Upper Basin's obligations, if any, under the Mexican Treaty. It may well be, in order to preserve the ability of the Upper Basin to meet it's ten-year obligation to the Lower Basin under the Compact, that in certain years releases of water from Lake Powell may be less than 8.23 MAF, or less than 7.5 MAF. Again, the only legal limitation is 75 MAF in any ten-year period. This position is consistent with the position previously taken by Upper Basin States.[7]

The EA and record of decision must correct these inaccuracies, and acknowledge that although the 8.23 MAF is an annual release objective, actual releases may be less depending upon Compact requirements and an ultimate determination of the Upper Basin's obligation to contribute to the Mexican delivery obligation.

For purposes of the EA, it is appropriate for the Bureau of Reclamation to assume that it will not release less than 8.23 MAF from Lake Powell annually between now and 2016.

6 | The analysis in the EA is based on the modeling assumption that releases through 2016 will not be less than 8.23 MAF.[8] We do not object to this assumption in the modeling, as it is likely that between now and 2016, such annual releases will not jeopardize the ability of the Upper Basin to meet its ten-year obligation to the Lower Basin to not deplete the flow of the Colorado River at Lee Ferry below 75 MAF. Nor

position of either the upper or lower basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact."

[5] Resolution of the Upper Colorado River Commission, February 27, 1971. Letter from Gerald R. Zimmerman, Executive Director of the Upper Colorado River Commission to Donald Paul Hodel, Secretary of the Interior, January 16, 1986. Additionally, §602 (a) (1) of the 1968 Colorado River Basin Project Act provides for releases from Lake Powell to supply one-half of any deficiency in Mexican Treaty deliveries only "if any such deficiency exists and is chargeable to the States of the Upper Division."

[6] The word "objective" is synonymous with "goal" or "purpose." It does not imply a requirement.

[7] *See, e.g.*, Letter from James S. Lochhead, Executive Director of the Colorado Department of Natural Resources to Bruce Moore, Upper Colorado Region, Bureau of Reclamation, December 31, 1996, regarding the proposed 5-year review of the Long Range Operating Criteria.

[8] *See*, EA at pp 7,8,9.

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5: See response to Comment 2-3 and Comment 2-4.

6: See response to Comment 2-4 and Comment 9-7.

6 Cont'd do we anticipate that the Mexican Treaty question will be at issue before that time. However, we do object strongly to any implication that this amount is an annual requirement, that releases cannot be less that this amount, or that such amount implies any obligation on the part of the Upper Basin to contribute to United States' delivery obligations to Mexico.

7 If drought conditions persist in the Upper Basin between now and 2016, it is possible that releases of less than 8.23 MAF may be required in order to maintain the Upper Basin's security that its ability to develop its Compact entitlement will not be impaired. Therefore, although it is appropriate for the Bureau of Reclamation to assume for purposes of the EA that it will not release less than 8.23 MAF from Lake Powell in any one year, the EA and the record of decision must acknowledge that

8 actual releases could be less than 8.23 in any year between now and 2016, although such a scenario is unlikely and not anticipated.

We appreciate your consideration of these concerns. We look forward to the Bureau's correction of these matters in the EA and the record of decision. If you have any questions as to our position or suggested changes to the draft EA, please do not hesitate to contact me.

Sincerely yours,

James S. Lochhead

Cc: Colorado River Water Coalition
Bennett Raley
Scott Balcomb
Wayne Cook

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7: See response to Comment 9-7.

8: See response to Comment 2-4.

Attachment
Examples of Erroneous References to Minimum Release
With Suggested Revisions
(Proposed deletions in strikethrough, additions underlined)

	Page	Statement
9	iv	"…pursuant to the Colorado River Basin Project Act of September 30, 1968. The Long-Range Operating Criteria are subject to the terms of the Colorado River Compact and the 'Law of the River.' Any ultimate determinations of the obligations of the Upper Basin, if any, with respect to any deficiency in deliveries under the Mexican Treaty and the obligation of the Upper Basin under Article III (d) of the Colorado River Compact will control the amount of water released from Lake Powell. Pursuant to these determinations, releases from Lake Powell in any one year could be more or less than 8.23 million acre-feet, without a change in the Long-Range Operating Criteria. This EA is not intended to be a definitive interpretation on any of those documents or to prejudice the position of any State with respect to the 'Law of the River.' This EA should be read in its entirety with that understanding.
10	iv	"In years w ~~When~~ projected storage in the Upper Basin is less than 602(a) storage, such storage equalization releases from Lake Powell are not made and the Secretary maintains an objective to ~~annual~~ release ~~of water from Lake Powell is limited to the~~ a minimum ~~annual release~~ of 8.23 million acre-feet as specified in the Long-Range Operating Criteria."
11	1	"When storage levels are below the 602(a) storage requirement, or when reservoir storage in Lake Powell is less than Lake Mead, water is conserved in Lake Powell by maintaining an objective to ~~releasing only the minimum objective~~ release a minimum of 8.23 million acre-feet. The ~~minimum~~ objective release ~~requirement~~ and the terms for making storage equalization releases are contained in the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Long-Range Operating Criteria). The Long-Range Operating Criteria are subject to the terms of the Colorado River Compact and the 'Law of the River.' Any ultimate determinations of the obligations of the Upper Basin, if any, with respect to any deficiency in deliveries under the Mexican Treaty and the obligation of the Upper Basin under Article III (d) of the Colorado River Compact will control the amount of water released from Lake Powell. Pursuant to these determinations, releases from Lake Powell in any one year could be more or less than 8.23 million acre-feet, without a change in the Long-Range Operating Criteria. This EA is not intended to be a definitive interpretation on any of those documents or to prejudice the position of any State with respect to the 'Law of the River.' This EA should be read in its entirety with that understanding."
12	2	"The Long-Range Operating Criteria established the ~~minimum~~ objective to ~~annual~~ release a minimum of 8.23 million acre-feet from Lake Powell in years when equilization releases are not required or storage is below 602 (a) levels. ~~This minimum objective release assures that the Upper Division States' downstream delivery requirements are met on an annual basis.~~"

9: See response to Comment 9-9.

10: See response to Comment 9-10.

11: See response to Comment 9-9 and Comment 9-11.

12: Per your comment the EA has been modified.

	Page	Statement
13	3	"Conversely, the Secretary maintains an objective ~~releases are constrained to the minimum annual~~ to release a minimum of 8.23 million acre-feet in years when ~~if~~ storage levels fall below 602(a) storage requirements, or when reservoir storage in Lake Powell is less than Lake Mead. The 602 (a) storage requirement is the "trigger point" for releasing ~~additional~~ water ~~(water in excess of 8.23 million acre-feet)~~ from Lake Powell to Lake Mead to equalize storage between the two reservoirs as provided by law."
14	3	"~~Since the Long-Range Operating Criteria requires minimum deliveries of 8.23 million acre-feet, even during extended periods of drought,~~ Lake Powell (and to a lesser extent other major reservoirs upstream of Lake Powell) provides the water storage to supply the required flows of the Colorado River to the Lower Basin."
15	3 (fn. 5)	"~~If water storage is above the 602(a) storage requirement, the Upper Basin can afford to release extra water downstream that is above the minimum required release of 8.23 million acre-feet per year~~."
16	4	"…releases from Lake Powell are often made that exceed ~~the minimum annual release requirement of~~ 8.23 million acre-feet."
17	4	"In years w ~~W~~hen the projected Upper Basin mainstem storage is less than the 602(a) storage requirement, storage equalization releases from Lake Powell are not made, and Secretary maintains an objective to ~~the annual~~ release ~~of water from Lake Powell is limited to~~ a minimum of 8.23 million acre-feet of water from Lake Powell."
18	5	"~~Just as the Colorado River Interim Surplus Guidelines provide a lower limit at Lake Mead for declaration of surplus through the year 2016, the proposed 602(a) storage guideline would provide a lower limit for annual releases of water in excess of 8.23 million acre-feet from Lake Powell through the year 2016~~."
19	7	"As discussed in the Introduction, storage equalization releases from Lake Powell ~~(releases in excess of 8.23 million acre-feet)~~ are linked to 602(a) storage requirements."
20	8	"In years w ~~W~~hen actual combined storage in these Upper Basin reservoirs at the end of any given water year (September 30) is projected to be below the computed 602(a) storage level (the line in figure 2.1), the Secretary maintains an objective to release a ~~water year releases from Glen Canyon Dam are restricted to the~~ minimum ~~objective release~~ of 8.23 million acre-feet."
21	iv, 9	"Under the Proposed Action Alternative, water year releases from Lake Powell would be made under the ~~minimum~~ objective of a minimum of 8.23 million acre-feet when Lake Powell is projected to be below 14.85 million acre-feet (elevation 3,630) on September 30."

13: See response to Comment 9-10.

14: Per your comment the EA has been modified.

15: Per your comment the EA has been modified.

16: Per your comment the EA has been modified.

17: See response to Comment 9-10.

18: See response to Comment 9-18.

19: Per your comment the EA has been modified.

20: See response to Comment 9-10.

21: See response to Comment 9-21.

2

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Page	Statement
10	"Under the No Action and Proposed Action Alternatives, the ~~minimum~~ objective to release ~~of~~ a minimum 8.23 million acre-feet at Lake Powell would ~~continue to be met~~ be maintained, subject to the Colorado River Compact and any ultimate determination of the obligations of the Upper Basin, if any, with respect to any deficiency in deliveries under the Mexican Water Treaty, which may require releases of a lesser amount. The proposed federal action does not modify the ~~minimum objective release in the~~ Long-Range Operating Criteria."

22: See response to Comment 9-9 and Comment 9-22.

3

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UPPER COLORADO
RIVER COMMISSION
355 South 400 East • Salt Lake City • Utah 84111 • 801-531-1150 • FAX 801-531-9705

October 30, 2003

- BY FAX AND U. S. MAIL -

U. S. Bureau of Reclamation
Upper Colorado Regional Office
ATTENTION: Tom Ryan
125 South State Street, Room 6107
Salt Lake City, Utah 84138-1147

Dear Mr. Ryan:

The Upper Colorado River Commission has reviewed the September 2003 draft Environmental Assessment (EA) for Adoption of an Interim 602(a) Storage Guideline and provides the following comments and suggestions.

1 We appreciate Reclamation's understanding of the critical nature of this Storage Guideline's implementation as Lakes Powell and Mead are declining due to extended drought in the Colorado River Basin. The Commission strongly encourages adoption of the 602(a) Storage Guideline as proposed as it relates to the adoption of not less than 14.85 million acre-feet (maf) as the 602(a) storage level at Lake Powell through 2016.

1: Comment noted.

2 Our review does cause us to be concerned about perhaps unintended differences of interpretation of the language of the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" (Operating Criteria). At numerous locations throughout the document discussing annual releases, we conclude the language suggests that a minimum annual release of 8.23 maf would be made. The Commission and its Upper Division States do not agree with this interpretation of the language of the Operating Criteria. We believe that such a minimum release would be inconsistent with provisions of the Colorado River Compact and the Upper Colorado River Basin Compact (Upper Basin Compact).

2: See response to Comment 2-4.

3 On several previous occasions, Reclamation and the Commission have discussed this critical interpretation and resolution of this dilemma. On the occasion of approval of the 1983 draft "Hydrologic Determination– Water Availability From Navajo Reservoir," the Commission's resolution contained the following: "The Commission does not endorse the projections of depletion. . . or the study assumptions set forth. . . ." These assumptions utilized a minimum release of 8.23 maf. The "Hydrologic Determination 1987--Water Availability from Navajo and the Upper Colorado River Basin for Use in New Mexico" contains a Commission disclaimer reiterated in the Commission's October 1987 Resolution: "and while it specifically disagrees

3: Comment noted.

3 Cont'd with the assumption of a minimum Upper Basin delivery of 8.23 maf annually at Lee Ferry, ..." In December 1996, then Colorado Commissioner and also Executive Director of the Colorado Department of Natural Resources James S. Lochhead provided comments on the ongoing five-year review of the Operating Criteria. The extensive text of his letter covered the following points:

(1) The States and the Commission objected to certain provisions of the Operating Criteria at its time of adoption.

(2) Protested the minimum release objective of 8.23 maf of water per year from Lake Powell.

(3) The 8.23 maf is only a release objective.

(4) Less than 8.23 maf could be released in one year if circumstances warrant, and without a change in the Operating Criteria.

4

(5) The Purpose of 602(a) is to "comply with and carry out the provisions of the Colorado River Compact, ..."

(6) Article II(5) of the Operating Criteria provides that the Operating Criteria "shall not prejudice the position of either the Upper or Lower Basin interests with respect to required deliveries at Lee Ferry pursuant to the Colorado River Compact."

(7) Irrespective of the minimum release objective specified in the Operating Criteria, the amount of water released from Lake Powell is ultimately controlled by the Colorado River Compact, the Upper Basin Compact and the Mexican Treaty.

5 We urge Reclamation to acknowledge, in the Final EA for adoption of an interim 602(a) Storage Guideline, the position of the Upper Colorado River Commission and the Upper Division States that releases from Lake Powell may be less than 8.23 maf in any one year in order to comply with the above-stated "Law of the River."

Very truly yours,

Jane Bird

for Wayne E. Cook
Executive Director

4: See response to Comment 2-3, Comment 2-4, and Comment 9-9.

5: See response to Comment 2-4.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

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UC 3384
4356

October 24, 2003

Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138

Subject: Interim 602(a) Storage Guideline for Mangagement of the Colorado River Draft Environmental Assessment (Draft EA)

Dear Mr. Ryan:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (DEA) for an Interim 602(a) Storage Guideline for Management of the Colorado River. Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

1 The potential impacts from the proposed guidelines include costs of moving boat launching facilities and marinas, impacts to energy production at Glen Canyon Dam and Hoover Dam, a potential increase to exposed shoreline at Lake Mead, potential for salinity increases at Lake Mead, and changes in the operation of the Colorado River system. EPA advocates operation of the Colorado River system in a way which will provide flexibility to accommodate future shifts in water policy and assure a long-term, sustainable balance between available water supplies, ecosystem health (e.g., in-stream beneficial uses), and water contract commitments.

1: Comment noted.

2 EPA commented on the Draft and Final Environmental Impact Statements (EISs) for the Colorado River Interim Surplus Criteria (CRISC). As noted in our comments on the CRISC Final EIS, we remain concerned with the potential impacts of changing water levels on contaminant dissolution and the probability of more frequent water shortages to other users of Lower Colorado River water. Because this issue is important, EPA is committed to working with the Bureau of Reclamation to address impacts resulting from lowered diffusion of contaminants such as perchlorate in Lake Mead.

2: Comment noted.

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We appreciate the opportunity to review this DEA. Please send a copy of the Final EA to this office at the same time it is officially released to the public. If you have any questions, please call Summer Allen, of my staff, at (415)972-3847 or allen.summer@epa.gov.

Sincerely,

Lisa B. Hanf, Manager
Federal Activities Office

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR 602 (a) STORAGE GUIDELINES, OCTOBER 24, 2003

Perchlorate

As noted in the Colorado River Interim Surplus Guidelines Final EIS, we remain concerned with the potential impacts of interim surplus criteria on perchlorate concentrations and distribution within Lake Mead and below Hoover Dam. The DEA states that there is a potential for storage reduction at Lake Mead. This could reduce dilution effects and potentially change contaminant movement within Las Vegas Bay and near the Southern Nevada Water Authority (SNWA) drinking water intakes. In particular, perchlorate is of concern because of its potential adverse health effects.

EPA considers perchlorate to be a water contaminant and is in the process of developing information that would support a specific regulatory level. As of January 2001, perchlorate is
3 included in EPA's nationwide "Unregulated Contaminant Monitoring Requirement" for public water supplies, with a method detection level of 4 parts per billion (ppb). Nearly every sample of Colorado River water from Las Vegas Wash to the Mexican border has exceeded 4 ppb for the last three years. During periods of destratification in Lake Mead, perchlorate levels in Southern Nevada Water Authority's intake exceed 11 ppb, including reports of 16 ppb in 1998 and 24 ppb in 2000.

Recommendation:

EPA has a vested interest in the perchlorate remediation program and in assuring the monitoring program has an adequate level of quality assurance. Please contact Kevin Mayer, Region 9 EPA, Northern California Cleanup Section, Superfund Division at: Mayer.Kevin@epa.gov, regarding the proposed monitoring program and perchlorate remediation program.

3: Reclamation shares your concern related to perchlorate concentrations in Lake Mead and the need for an adequate monitoring program. The Proposed Action Alternative will not have an effect on the influx of groundwater into Lake Mead contaminated with perchlorate. A perchlorate interception system is now in place which, through the use of wells, extracts contaminated groundwater.

Water Supply

The modeling in the DEA assumes that the Quantification Settlement Agreement (QSA) is executed. However, this Agreement has been the source of much debate. We remain concerned regarding the probability of more frequent and higher magnitude water shortages to other users of Lower Colorado River water and effects of the Proposed Action on the ability of Southern Nevada
4 Water Authority's ability to utilize their intakes at all times.

Recommendation:

Additional information should be included in the Final EA regarding proposed reparation and/or forbearance agreements and a commitment should be made to develop mitigation measures for potential increased water supply shortages. Information should be included regarding the potential effects of the Proposed Action on the ability of Southern Nevada Water Authority to utilize their intakes. In addition, updated information regarding the status or substantial changes to the QSA should be included in the Final EA.

4: Modeling of the Proposed Action Alternative and the No Action Alternative showed that there would be no increase in water shortages caused by the proposed action. Simulation modeling also showed that there would be no effect to Lake Mead water levels below elevation 1,050 feet and that Southern Nevada Water Authority's ability to utilize their intakes would not be limited (although there could be some minor increased pumping costs as discussed in the section of the EA). A paragraph in the section of the EA on Water Supply has been added to address your concern. Also see the response to Comment 4-3 related to the execution of the Colorado River Water Delivery Agreement (Quantification Settlement Agreement).

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR 602 (a) STORAGE GUIDELINES, OCTOBER 24, 2003

Aquatic and Wildlife Resources

The DEA refers to Section 3.7 of the Colorado River Interim Surplus Criteria (CRISC) Final EIS for information on aquatic resources and related conservation measures as proposed by the Bureau of Reclamation. The DEA determines that the fluctuating lake levels would not influence aquatic resources. However, potential increases in water surface elevation of Lake Powell and decreases in Lake Mead might favor species more tolerant of these varied conditions and temperatures. The EA also states there are no undisclosed effects on species covered by the Fish and Wildlife Coordination Act of 1934. 5

Recommendation:

The Final EA should fully evaluate impacts on habitat changes and species adaptability. Any impacts to special status species such as the endangered razorback sucker and the endangered southwestern willow flycatcher should be disclosed and avoided. U.S. Fish and Wildlife Service's agreement on the project's effects to these species should be documented in the Final EA. Compliance with conservation measures as described in the CRISC Record of Decision should be assured in the Final EA.

2

5: The Proposed Action Alternative will have no measurable effects on aquatic resources. While it is possible that there could be some short-term changes in the elevation of Lake Powell and Lake Mead, the total range of fluctuation at these two reservoirs will not change as a result of the Proposed Action Alternative when compared to the No Action Alternative. Lake Powell and Lake Mead are constantly fluctuating in response to hydrology in the Colorado River Basin. The most probable range of fluctuation at Lake Powell through the year 2016 is 117 feet and at Lake Mead is 84 feet under both the Proposed Action and No Action Alternatives. It is within this range of fluctuation, that occur under normal operations, that there could be some difference between the Proposed Action and No Action Alternatives. Because of this, the draft EA concludes that there will not be measurable effects on aquatic resources. The Aquatic Resources section of the EA has been modified to better convey this information.

Reclamation has made a determination of "no effect" to endangered species in the potentially affected area. It is the policy of the United States Fish and Wildlife Service not to provide concurrence letters for such a "no effect" determination. The Fish and Wildlife Service provided comments on the draft EA and stated that the additional 12 percent probability of declines in Lake Mead elevations resulting from the proposed action for 602(a) storage is not a significant change requiring revisiting the conservation measures included by Reclamation in the Interim Surplus Guidelines Record of Decision (see Comment 13-4). Reclamation remains committed to the conservation measures included in the Interim Surplus Guidelines.

United States Department of the Interior
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:
AESO/SE

October 17, 2003

Memorandum

To: Regional Director, Upper Colorado Region, Bureau of Reclamation, Denver, Colorado
(Attn: Tom Ryan)

From: Field Supervisor

Subject: Draft Environmental Assessment for Adoption of an Interim 602(a) Storage Guideline

We appreciate receiving notice of the availability of the draft Environmental Assessment (EA) for the Adoption of an Interim 602(a) Storage Guideline for equalization releases between Lake Powell and Lake Mead during the 16-year period covered by the Interim Surplus Guidelines. We have reviewed the draft EA and have the following comments for your consideration.

1 We are familiar with the CRSS-River Ware modeling simulations used in this draft EA and in previous documents concerning the Interim Surplus Guidelines and other Colorado River issues. We suggest that the first paragraph under "Overview of Modeling Results" be moved to between the second and third paragraphs of "River Simulation Modeling" as it explains how the modeling is accomplished. We also suggest that an additional paragraph be included in "River Simulation Modeling" that explains more clearly to the reader that the traces are not in any way predictive of a potential future condition, but represent a possible series of futures bases on inflows and inflow patterns from the recent past. Effects to elevations of Lake Powell and Lake Mead from the actual series of wet or dry years through 2016 may be very different from those shown in the model runs. While we understand the need and applicability of these models in evaluation of effects, we believe some additional explanation for the reader is appropriate.

1: Per your comment the EA has been modified.

2 Please include reference to Attachment B when describing the existing 602(a) algorithm in Chapter 2 and under "River Simulation Modeling."

2: Per your comment the EA has been modified.

3 The inclusion of information concerning the effects of the 70R surplus strategy in concert with the proposed action is very appropriate for this draft EA, given that at the time of its preparation the Quantification Settlement Agreement had not been approved by California. With the QSA now shortly to be in effect, and with it, the Interim Surplus Guidelines, we suggest that the information on the 70R surplus strategy be retained in the final EA, perhaps in an attachment, for reference in the future.

3: Comment Noted. Attachment C has been included in the final EA.

Concerning effects to biological resources in Lake Mead, the effects of the proposed action are additional to the effects of implementing the Interim Surplus Guidelines for the next 16 years.

4 Those effects were addressed in a biological opinion issued to Bureau of Reclamation's Lower Colorado River in 2001. As with the proposed action, the effects of the Interim Surplus Guidelines were described using the CRSS-River Ware modeling. Conservation measures included by USBR-LC in the Interim Surplus Guidelines proposed action were based on the types of effects described by the modeling traces. The additional 12% probability of declines in Lake Mead elevations resulting from the proposed action for 602(a) is not a significant change requiring revisiting of those conservation measures.

4: Comment Noted. Reclamation remains committed to the conservation measures in the Interim Surplus Guidelines Record of Decision.

5 In the section "Special Status Species" the last sentence in the fourth paragraph is in error. Lake Mead is designated as critical habitat for the razorback sucker (*Xyrauchen texanus*). There is no designated critical habitat for the southwestern willow flycatcher (*Empidonax traillii extimus*) at Lake Mead.

5: Per your comment the EA has been modified.

Thank you for the opportunity to review this draft EA. If there are any questions concerning these comments, please contact Lesley Fitzpatrick (x236) or Tom Gatz (x240).

Steven L. Spangle

cc: John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Director, Region 6, Fish and Wildlife Service, Denver, CO
Regional Director, Lower Colorado Region, Bureau of Reclamation, Boulder City, NV

W:\Lesley Fitzpatrick\602a draft EA comments wpd:cgg

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Department of Energy
Western Area Power Administration
P.O. Box 11606
Salt Lake City, UT 84147-0606

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Mr. Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, UT 84138-1147

Dear Mr Ryan:

Following are comments by the Western Area Power Administration's Colorado River Storage Project Management Center to the draft Environmental Assessment (EA) titled "Adoption of an Interim 602(a) Storage Guideline."

In the "Overview of Modeling Results" section on page 15 of the draft EA, Reclamation describes the use of the Indexed Sequential Method in performing the river modeling used as a basis for the analysis reported on in the EA. The method uses 85 historical traces, corresponding to Colorado River runoff over the years 1906 through 1990.

Although the 85 traces cover "a broad range of possible future hydrologic conditions," they exclude information from more recent years such as 2002 and 2003 - years that have produced hydroelectric generation and Glen Canyon lake elevations lower than any year since all the CRSP powerplants became operational. Including the years since 1990 in the river model, especially the low water years of 2002 and 2003, has the potential to alter the range of possible future hydrologic conditions and change the probability of a measurable difference between the proposed alternative and the no-action alternative.

1 As the remainder of the environmental impact assessment in the EA depends on the statistical analysis of the modeling results, it is very important to be sure that the modeling covers as wide a range of future conditions as possible. Although Western believes that the addition of 13 years of historical record are unlikely to change the conclusions of Reclamation's EA, we recommend that Reclamation consider expanding the 85 historical traces with more recent hydrologic information.

Thank you for the opportunity to comment on the draft EA.

Sincerely,

Sam Loftin
General Engineer

1: The Colorado River Simulation Model uses natural flow in model input. Reclamation's natural flow database extends from 1906 to 1990. Work is being completed to extend this natural flow database through 1995. Draft natural data has been developed for 1991 through 1995, and it is expected that this data will be finalized in the spring of 2004. Reclamation is also planning to extend the natural flow data set through the year 2000 in the year 2004. The development of natural flow data requires that consumptive uses and losses statistics in the Colorado River Basin be completed. Generally there are several years lag time before such data is available. Because of this, we are unable to utilize data to include the last 13 years as you request. Historical data in the natural flow data set, however, serves to mimic such dry periods as we recently experienced. For example, the four year period of 1953 through 1956 has approximately the same natural flow at Lees Ferry, Arizona, as does the period 2000 through 2003.

ORIGINAL

State Engineer's Office

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PATRICK T. TYRRELL
STATE ENGINEER

IN 603-1

October 31, 2003

Sent Via E-Mail with Hard Copy to Follow Via U.S. Postal Service

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Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138-1147

Dear Tom:

This letter is sent in response to Regional Director Gold's September 30th Memorandum advising of the availability of the Draft Environmental Assessment (Draft EA) for *Adoption of an Interim 602(a) Storage Guideline"* dated September 2003. That Memorandum also advised of the publication of a notice of availability and of the solicitation of comments from interested parties on the Draft EA in the September 30th edition of the Federal Register.

1 On behalf of the State of Wyoming and as Wyoming's Commissioner to the Upper Colorado River Commission and the Governor's Representative for Colorado River Matters, I am writing to express our support for the adoption of the 602(a) Storage Guideline (hereafter "interim 602(a) guideline"), that will explicitly direct that the 602(a) storage level at Lake Powell will be determined to be not less than 14.85 million acre-feet of storage (elevation 3630) during the Interim Period ending in 2016.

1: Comment noted.

2 Our review of the analyses contained in the Draft EA indicates that the imposition of this Guideline will have minimal impacts on any relevant resource, including water supply and the environment. Those familiar with the ongoing development of California's Colorado River Water Use Plan and the Colorado River Interim Surplus Guidelines will recall the genesis of the interim 602(a) guideline as being with the Upper Basin States as a means to minimize the impacts, if any, of the interim surplus guidelines that were then being proposed. The seven Colorado River Basin States jointly proposed this 602(a) guideline as part and parcel of the interim surplus guidelines, which were implemented through the Secretary of the Interior's signing of the *Record of Decision Implementing the Colorado River Interim Surplus Guidelines Through 2016* on January 16, 2001. We therefore are pleased that this interim 602(a) guideline is now proceeding towards implementation.

2: Comment noted.

As articulated in the Colorado Water Conservation Board's October 28, 2003 letter, Mr. D. Larry Anderson's October 24th letter on behalf of the State of Utah, and the letter you recently received from the Upper Colorado River Commission commenting on this interim 602(a)

Surface Water (307) 777-7354 | Ground Water (307) 777-6163 | Interstate Streams (307) 777-6150 | Board of Control (307) 777-6178

guideline, Reclamation's draft EA fails to appropriately characterize the minimum annual objective release amount specified in the 1970 *Coordinated Long Range Operating Criteria for Colorado River Reservoir System*. Wyoming is very concerned that the Bureau of Reclamation has failed to acknowledge that Reclamation and the Upper Division States and the Upper Colorado River Commission have "agreed to disagree" on many, many occasions with regard to the force and effect, if any, of the "minimum annual objective release" language found in the Coordinated Long Range Operating Criteria. There is an extensive "paper trail" dating back to 1970 on this matter. Reclamation's failure to acknowledge the Upper Division States and Upper Colorado River Commission position and therefore include in the draft EA analyses of alternative operations of the reservoir system that respect our long-standing position on this important matter is disheartening and troubling. 3

We trust that Reclamation will correct this shortcoming in the Final EA and address this long-standing interpretation difference in the Record of Decision in a manner that acknowledges and protects our long-standing position with regard to the minimum annual objective release amount.

Please contact this office if we may answer any questions. Thank you, again, for your efforts in moving the interim 602(a) guideline towards promulgation.

With best regards,

for Patrick T. Tyrrell
Wyoming State Engineer

cc: Governor Dave Freudenthal, Seven Colorado River Basin State Representatives, Upper Colorado River Commission, Alternate Wyoming Commissioners, Interstate Streams Engineer

3: See response to Comment 2-3 and Comment 2-4.

United States Department of the Interior

NATIONAL PARK SERVICE
Colorado River Coordinator Office
324 South State Street, Suite 200
Salt Lake City, Utah 84145

IN REPLY REFER TO.

November 4, 2003

To: Tom Ryan, Bureau of Reclamation, Salt Lake City

From: Arturo Henderson, NPS Colorado River Coordinator, Salt Lake City

Subject: NPS comments on draft EA "Adoption of an interim 602(a) storage guideline"

The subject document has been reviewed by the National Park Service. The NPS is not opposed to the proposal as drafted and agrees with the BOR determination of impairment to NPS resources within Grand Canyon National Park, Glen Canyon National Recreation Area, and Lake Mead National Recreation Area made at the conclusion of the draft document. We provide the following comments to facilitate completion of the final EA and ultimate implementation of the proposal:

1. **Additional alternatives** - Given the purpose and need for the action stated in the EA (i.e., to establish a specific level on which to base equalization flows), it would seem that additional alternatives are possible. The EA should include all "reasonable alternatives" that address the stated purpose for the action or specify why no other alternatives were considered.

2. **Effects on flows and lake levels** – The predicted effects to lake levels and flows were based on the River Ware modeling package using historic hydrology. In that model, the initial level of Lake Powell would likely affect the impact predictions made. For this EA, the initial level for Lake Powell is not specified but it appears to assume a much higher level than is presently occurring. This problem is born out by the predictions made in Table 3.2 where the 50th percentile water level for Lake Powell for July 2004 is close to 3,635', which is much greater than the latest 24 month-study has predicted for the same time period (approximately 3,600').

1: No other alternative that meets the purpose and need other than the Proposed Action Alternative has been identified.

2: The modeling in the EA initializes with conditions as of January 1, 2003. Because 2003 was a drier than average year, most probable reservoir output for 2004 from the EA, as you note, does not coincide with Reclamation's 24-month study operations model, which is updated monthly. Reservoir storage at Lake Powell and Mead on January 1, 2004, deviates from most probable levels as predicted by the model. However, observed January 1, 2004 storage at Lakes Powell and Mead is within one standard deviation of the most probable level as predicted by the model used in the EA, and the January 2004 storage levels are well within the extremes of possible hydrologic scenarios considered in the modeling. Because the Colorado River Simulation System uses the Indexed Sequential Method, there are numerous "traces" which follow dry trends such that the continuation of the current drought in the Colorado River is considered in modeling and analysis. For example, the four year period of 1953 through 1956 has approximately the same natural flow at Lees Ferry, Arizona as does the period 2000 through 2003. Reclamation believes that the current modeling accurately describes the effects of the Proposed Action Alternative.

2 Cont'd

For Lake Mead, the latest 24 month study predicts that the 50th percentile water level in December 2004 to be between 1,125' and 1,132' (with and without ISG, respectively). However, Figure 3.7 predicts Lake Mead to be approximately 10' higher. It would seem that any modeling used to predict changes to lake levels should start with the existing condition or explain why a different starting level was used.

In addition, the most recent hydrologic data should be used in the model as well since the last few years have been extremely dry.

3

3. **Consistency** – Figure 3.7 uses end of December elevations whereas previous figures for Lake Powell use end of July water elevations. Figure 3.3 does not specify the time of the elvations used. It would seem that the same evaluation metrics should be used and specified in the figures.

4

4. **Influence of upper basin CRSP dams** – The manner in which the upper Colorado River reservoirs are operated will affect end of year water levels in Lake Powell. The degree to which these operations could be modified to influence the 3,630' trigger elevation for equalization flows is not specified and should be explained.

5

5. **Mitigation** – The EA acknowledges that under certain circumstances establishing an elevation threshold for Lake Powell will result in impacts to recreational facilities at Lake Mead (up to $1 million over 13 years). Given this, BOR should consider identifying the hydrologic circumstances when Lake Mead would be affected and help the NPS mitigate the affect of those impacts at those times.

6

6. **Cultural resources** – The NPS urges the BOR to complete the necessary consultation with the tribes, SHPO, and THPO, and immediately proceed with the identification and evaluation of inundated and exposed sites.

3: See response to Comment 4-7.

4: Colorado River Storage Project reservoirs above Lake Powell are operated independently of Lake Powell as noted in the EA in the Potentially Affected Area section. Such reservoirs will not be operated in the future to influence 602(a) storage levels in Lake Powell.

5: As noted in the EA, there is a 12 percent probability that the Proposed Action Alternative would result is some change in reservoir elevations at Lakes Powell and Mead. However, the magnitude of these changes is relatively low (the greatest change at Lake Mead between the two alternatives, as noted in the EA, is a decrease of 4.1 feet). More importantly, resultant reservoir elevations under the Proposed Action Alternative are well within normal operating parameters. Lake Powell and Lake Mead can be expected to significantly fluctuate in water surface elevation in the future over multi-year time spans in response to wet and dry cycles in the Colorado River Basin under either the Proposed Action Alternative or the No Action Alternative. Reclamation believes that mitigation is not warranted in this context. Reclamation will continue to work with the National Park Service, the marinas, and the public to make available the best information related to predicted water surface elevations to assist in recreation resource planning activities.

6: Comment noted. Reclamation remains committed to the identification and evaluation of inundated and exposed cultural resources at Lakes Powell and Mead and to the commitments made in the Interim Surplus Guidelines Record of Decision.

Mark Belles
9318 Willard Street
Rowlett, Texas 75088

Tom Ryan
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street
Salt Lake City, Utah 84138

08 October 2003

Dear Mr. Ryan,

Regarding the "Notice of of availability of the Draft Environmental Assessment for an interim 602(a) storage guideline for Management of the Colorado River, as published in the Federal Register dated 30 September 2003 (Volume 68, Number 189), please place my name on the mailing list for this process.

1 | After review of the Draft EA, I agree with the proposed action. One consideration I would like to see
2 | addressed is a means to limit the losses of water through evaporation and seepage in the reservoir storage system.

Please send me a copy of the final EA (on CD-ROM if possible).

Thank you for the opportunity to comment,

1: Comment noted.

2: Inherent in the storage of water in reservoirs is the loss of some water to evaporation. In the desert southwest regions of the United States, reservoir evaporation is more significant than most areas because of the dry hot climate in the region. At Lake Powell, reservoir evaporation over the past 24 years (since the first filling of Lake Powell in 1980) has averaged 550,000 acre-feet per year. Seepage (bank storage) can also be a loss of water. These losses are accepted as a "cost of business" in the storage and delivery of water and power. Reclamation carefully accounts for reservoir evaporation and seepage at Colorado River reservoirs. However, to address means of limiting losses of water through evaporation and seepage is outside of the scope of the proposed federal action in this National Environmental Policy Act document.